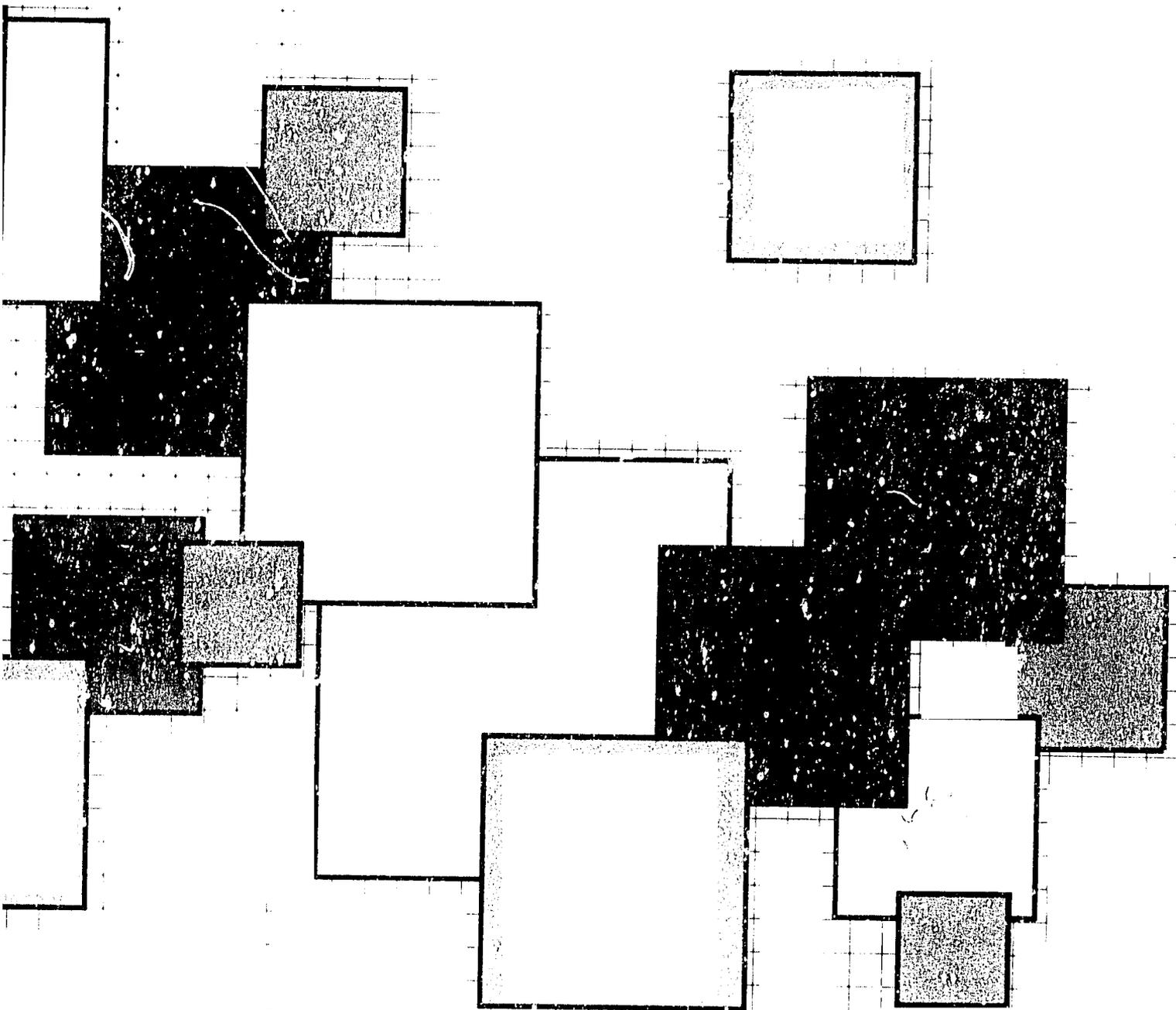


TECHNOLOGY DEVELOPMENT,
AND TRANSFER SYSTEMS IN AGRICULTURE

ANNOTATED BIBLIOGRAPHY
ON DEVELOPMENT AND TRANSFER
OF AGRICULTURAL TECHNOLOGY

Volume 2



INTERPAKS
Office of International Agriculture
University of Illinois at Urbana-Champaign

INTERPAKS, the International Program for Agricultural Knowledge Systems, is an educational, non-profit program of the University of Illinois at Urbana-Champaign. Established in 1982, INTERPAKS involves a unique mix of fields of study which, together, bring a more balanced, integrated, holistic approach to the processing, transfer and use of agricultural knowledge. The primary fields in INTERPAKS include: agricultural communications, agricultural economics, agricultural education, extension administration and education, library and information science, and rural sociology.

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ON DEVELOPMENT AND TRANSFER
OF AGRICULTURAL TECHNOLOGY

Volume 2

Compiled by
Leila A. Sfeir

Technology Development and
Transfer Systems in Agriculture

a project of



INTERPAKS, International Program for Agricultural Knowledge Systems
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Preface

The development, transfer and utilization of technology by farmers continues to be a major concern of national governments and donors. About two and one-half years ago, the International Program for Agricultural Knowledge Systems (INTERPAKS) at the University of Illinois at Urbana-Champaign joined with the United States Agency for International Development (USAID) in a cooperative agreement to better understand national technology systems in agriculture.

The objectives of this project included (1) developing, field testing and fine-tuning an analytical framework that could be used in identifying constraints of national technology systems, (2) conducting case studies of national systems, using the analytical framework and other descriptive information and (3) reviewing the relevant literature, developing a computerized data base and publishing bibliographies that contain research papers and other publications that contribute to our understanding about national technology systems.

This second volume has been prepared to complement the first volume, which was published in 1985. There is no duplication between the two volumes and the index in this volume includes all published works that are cited in both publications. Furthermore, these two bibliographies are not an exhaustive coverage of the literature in this area, but they do contain many of the significant works across a spectrum of disciplines that address this broad problem area.

As was the case with the first volume, this bibliography is organized along the lines of the

analytical framework that is emerging from the project. In fact, many of these references included here have been used to develop the theoretical rationale for the framework and the different indicators that have been constructed to measure system functioning. This framework and the analytical tools are now being field tested and refined as the INTERPAKS research team carries out a series of case studies of national systems.

Many faculty and graduate students have played important roles in producing this second volume. In particular, I would like to give my sincerest thanks to Leila Sfeir for taking the leadership in compiling this second volume. Dr. Sfeir stepped into this role less than a year ago and her enthusiasm, patience and hard work in producing this volume are much appreciated. In addition, thanks should be given to Jane Johnson, who was the original bibliographer and information specialist on the project and whose work and contribution extend into this second volume. Also, I would like especially to thank Andrew Sofranko, Frederick Fliegel and Carolyn Sands who each made major contributions. Other members of the INTERPAKS research team who contributed to this volume include John B. Claar and Katherine Cloud. Ms. Lori Snipes gave excellent assistance in entering much of the information into the data base and in generally supporting the work of the project. To each of these individuals, I extend my sincerest thanks and appreciation.

Burton E. Swanson
Research Director

Introduction

This set of abstracts has been prepared through the International Program for Agricultural Knowledge Systems (INTERPAKS) at the University of Illinois at Urbana-Champaign, in cooperation with the United States Agency for International Development (USAID) to better understand national technology development and transfer systems.

The objectives of this Annotated Bibliography include: (1) developing and maintaining a resource center using a microcomputer for bibliographic database; (2) gathering, abstracting, and indexing literature on agricultural technology development, transfer and utilization systems; and (3) generating and disseminating printed bibliographies from the database to provide access to the literature.

The subject scope of this Annotated Bibliography, Volume 2, includes six sections: (1) agricultural development at a general level, (2) agricultural policy and planning, (3) generation of agricultural technology, (4) transfer of such technology, (5) utilization of agricultural technology by farmers and finally, (6) a listing of sources of technical reference materials. The first section deals with agricultural research and development in a holistic way, while sections two through five contain works more explicitly oriented to what might be called parts of the larger system—policy, technology generation, transfer, and utilization. The last section, a listing of

sources of technical materials, presumably needs no explanation.

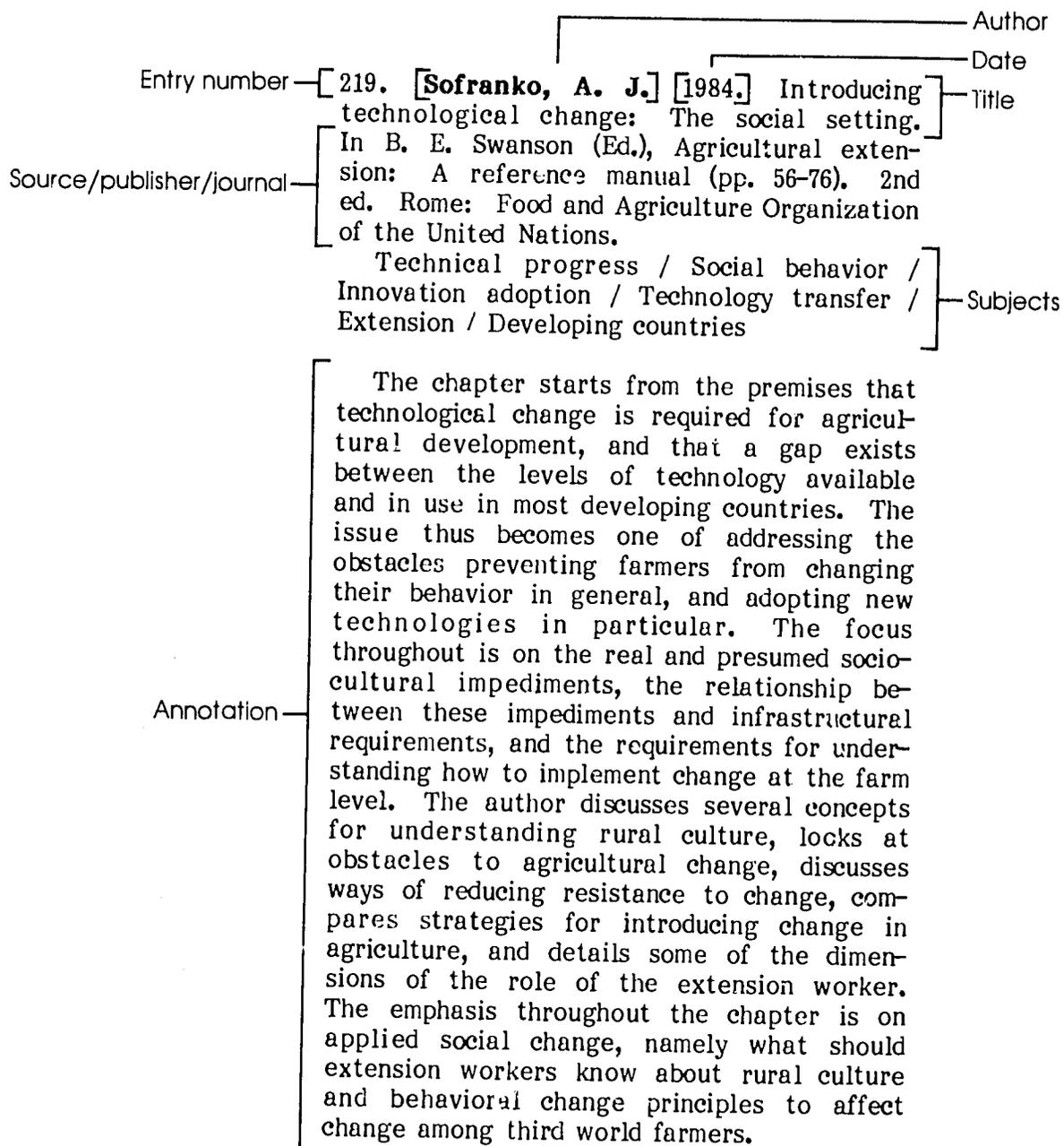
This bibliography places special emphasis on books and on documents such as reports, proceedings, and conference papers to assist in the discriminating use of the large volume of relevant literature on agricultural and rural development. If availability of material is the first problem, the second is discriminating access to what is available.

This bibliography has been prepared using INMAGIC as the database management system; used to store and retrieve information. Wordperfect software was used to interface with the output from the database management system in order to produce camera ready copy for publication.

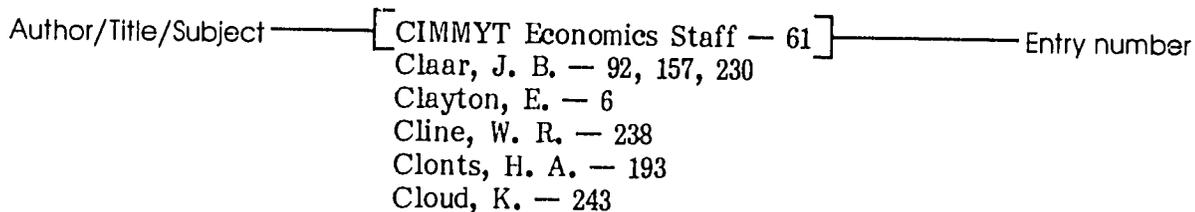
I am grateful to the INTERPAKS research team, including John B. Claar, and Katherine Cloud, in guiding the selection of the items to be included in the bibliography. My deepest thanks and appreciation go to Frederick Fliegel, Carolyn Sands and Andrew Sofranko for their support and assistance and their invaluable contribution in abstracting. Special appreciation is extended to Jane Johnson who guided my first steps in INMAGIC, and Lori Snipes for her excellent word processing performance.

Leila A. Sfeir

Guide to Entries



Guide to Indexes



Agricultural Development-General

272. **Agency for International Development.** 1982. Women in development. Washington, D.C.: Bureau for Program and Policy Coordination, U.S. Agency for International Development. 12 p. (A.I.D. policy paper).

Women / Development

Demonstrates how the concerns of women in developing countries are to be integrated into AID's program. Meant to provide the policy framework and overall practical guidance for each sector and for the Agency as a whole in its efforts to incorporate women into the total development process.

273. **Aklilu, D. A.** 1983. Appropriate technology for women in food production. Rome: Food and Agriculture Organization of the United Nations. Paper presented at the Expert Consultation on Women in Food Production, Rome, Italy, 7-14 December 1983. 17 p. (ESH: WIFP/83/9).

Appropriate technology / Social change / Women / Agricultural production

Shows through case studies that the social and institutional processes that precede the introduction of technology are partly what determine the appropriateness of the input and are equally, if not more, important than the technological intervention.

274. **Barker, R.** 1984. The Philippine rice program: Lessons for agricultural development. Ithaca, NY: Department of Agricultural Economics, Cornell University. 23 p. (Cornell international agriculture mimeograph 104).

Agricultural development / Rice / Constraints / Philippines / Technology development

Describes the success of the Philippines program in rice production emphasizing the coordinated approach followed by agencies of the Philippines government working hand in hand with foreign donors. Discusses the important factors that have led to the success of the rice program. Looks at the issue of how to extend the success in rice to other

segments of agriculture. Delineates some of the technical, infrastructure and policy constraints to development of rainfed agriculture.

275. **Barnes, V. L.** 1984. Changes in crop mixtures and their relationship to gender role changes among the Lugbara. Cambridge, MA: Women and International Development, Joint Harvard/MIT Group. 13 p. (WID working paper no. 2).

Roles / Farming systems / Women / Uganda / Zaire

A paper presented at the Fourth Annual Workshop on Women, Work and Public Policy, sponsored by Women and International Development, April 14, 1984. Presents a historical description of the changes in cropping patterns of the Lugbara peoples now living in areas of Uganda and Zaire. In particular, describes the introduction of cassava by western colonialists and the effect it has had on cropping systems and nutrition for the Lugbara. Outlines the decision making process of women as to which staple crops should be grown - mainly cassava or millet - and the concerns of the women in providing the labor to produce the various crops.

276. **Blustain, H.** 1982. Resource management and agricultural development in Jamaica: Lessons for a participatory approach. Ithaca, NY: Rural Development Committee, Center for International Studies, Cornell University. 151 p. (Special series on resource management, RM no. 2).

Resource allocation / Agricultural development / Social participation / Rural development / Jamaica

Presents a case study and analysis of the Second Integrated Rural Development Project (IRDP) in Jamaica. The study emphasized the necessity of understanding the context in which a project is to operate and of utilizing that context in implementing a project. The IRDP was a five-year program promoting soil conservation and seeking to establish "an

2 Agricultural Development - General

agricultural production model that could be replicated in small hillside farms throughout Jamaica." The project focused on two watersheds requiring priority treatment located in central Jamaica's hill country. The outcome of the project was disappointing. Farmers built erosion control structures while being subsidized but failed to maintain them once subsidy ceased. For the most part, extension recommendation was not accepted and the proposed production model was not adopted. Establishing pine forests on marginal land was more successful. The study examines the participation in the IRDP and reviews the role of politics in agricultural development in Jamaica discussing the tradition and influence of patronage. The final chapter examines the possibility of change occurring between farmers and the government given the constraints of politics and the existing production problem. Specific problems such as lack of farmer participation and short-term participation are discussed and eight lessons extracted from the project experience are presented.

277. **Blustain, H., LeFranc, E. (Eds.).** 1982. *Strategies for organization of small-farm agriculture in Jamaica.* Ithaca, NY: A joint publication of the Institute of Social and Economic Research, University of the West Indies, and the Rural Development Committee, Center for International Studies, Cornell University. 217 p.

Agricultural development / Socio-economic organization / Development policy / Jamaica / Social participation

This volume contains a series of papers presented at a conference, "Organizational Strategies for Agricultural Development" held at the University of the West Indies, Mona, April 27-28, 1981. The papers examine various organizational issues relevant to the viability of the small farmer in Jamaica. The work is divided into four parts. The first is an overview that contains an introduction to the volume and a review of Jamaica's small farm sector, agricultural policy, and previous agricultural development efforts. The second section examines production factors, reviewing

land tenure and its relation to development and how farm labor is used and organized. The third part, the most extensive, describes and evaluates organizational alternatives in the small farm sector. Within this section the structure and functioning of an agricultural cooperative is described in detail. Domestic food marketing, commodity associations and agricultural production are also examined. Finally clientele and local organizations are described and discussed. The final section presents the conclusion, emphasizing the fact that successful planning and implementation of agricultural policies is dependent upon taking into consideration local ideas, institutions and organizations.

278. **Bor, W. van den, Fuller, A. M. (Eds.).** 1983. *Proceedings - Universities and Integrated Rural Development in Developing Countries, August 21-25, 1983: An international conference.* Wageningen, Netherlands: Agricultural University. 234 p.

Rural development / University research

Proceedings of an international conference sponsored jointly by the University of Guelph, Canada and Wageningen Agricultural University, The Netherlands. The papers are divided into three major sections: (1) the third world university perspective; (2) the first world university and (3) the agency perspective. The specific objectives of the conference were to reach consensus on the responsibilities of the universities in integrated rural development, to identify the capabilities (both strengths and weaknesses) and to recognize the realities which tend to influence and constrain the achievement of goals.

279. **Bryant, C., White, L. G.** 1984. *Managing rural development with small farmer participation.* West Hartford, CT: Kumarian Press. 179 p.

Rural development / Social participation / Small farms / Management / Organizations

The monograph is a "how-to" manual which examines ways to increase small farmer

participation in rural development programs and projects. Discusses the organizational and institutional impediments to participatory rural development projects. It begins where much of the development management literature stops. Assumes that participation is both important and difficult. Then it goes on to discuss how to expand participation, how to develop participatory institutions, and how to develop and coordinate the participatory process.

280. **Callear, D.** 1983. Women and coarse grain production in Africa. Rome: Food and Agriculture Organization of the United Nations. Paper presented at the Expert Consultation on Women in Food Production, Rome, Italy, 7-14 December 1983. 17 p. (ESR: WIFP/83/1).

Coarse grains / Women / Africa

Yield, price, input costs, markets and labor requirements affect the choices of farmers in producing maize, sorghum, millet or rice. These choices are carefully made by men and women farmers in response to their specific circumstances. For women, returns to labor are likely to be crucial because of their already great time constraints. Within households the opportunity costs of acceptance of new crops and technologies are usually different between men and women. Changes that undermine women's ability to provide family food are undesirable.

281. **Casley, Denis J., Lury, Denis A.** 1982. Monitoring and evaluation of agriculture and rural development projects. Baltimore: The Johns Hopkins University Press. viii, 145 p.: ill.

Management / Rural development / Monitoring / Evaluation / Indicators / Methods

Provides a how-to-tool for the design and implementation of monitoring and evaluation systems in rural development projects. Rural development are complex, seek to reach large number of people in usually remote areas, and involve a variety of investments. The need for monitoring and evaluating them during

implementation has been accepted in principle, but effective systems have not yet been formulated. This book differentiates the concepts of monitoring and evaluation and sets out the issues that need to be considered in designing systems to monitor and evaluate specific projects, emphasizing the timeliness of the monitoring functions for effective management. The study further elaborates on such technical issues as selection of indicators, selection of survey methodology data analysis, and presentation. It is directed primarily to those working with specific projects and will be useful to project appraisal teams, to designers monitoring and evaluation systems, and to project staff who work with these systems.

282. **Catelli, G. P.** 1981. Borgo a Mozzano revisited: A Sociological evaluation of the diffusion of innovations. In B.R.Crouch and S. Chamala (Eds.), Extension education and rural development. Vol. 1: International experience in communication and innovation (pp. 85-96). Chichester, England: John Wiley.

Community development / Diffusion of information / Sociological analysis / Italy / Social structure

Describes a research methodology for sociological evaluation which records the community's attitude toward change, its propensity to accept it and the effect on the community of the subprocesses of encouraging change. Provides evidence that technical innovations had a considerable and detrimental effect on the social structure of the Borgo a Mozzano. Points out that organizations are too eager to introduce change without prior assessment of the merits of introducing innovations as instruments of change. Not all people in the community reacted favorably to the innovations and this provided social disequilibrium within the community and between family members.

283. **Cloud, K.** 1985. Women farmers and AID agricultural projects: How efficient are we? In R. S. Gallin and A. Spring (Eds.),

4 Agricultural Development - General

Women creating wealth: Transforming economic development (pp. 166-170). Washington, D.C.: Association for Women in Development.

Women / Farmers / Roles / Development projects / Evaluation / Africa

Since 1973, legislation has required that attention be paid to women's economic roles in development projects, and in 1985 AID commissioned a large-scale evaluation of the implementation of this policy. This paper examines the interaction of gender roles with eight large agricultural projects. It seeks to understand the circumstances in which both equity and efficiency can be served by women's access to project resources.

284. **Davis, T. J. (Ed.)**. 1984. Proceedings of the Fourth Agricultural Sector Symposium. Washington, D.C.: World Bank. 360 p.

Agricultural development / Farming systems / Watershed management / Herbicides / Tillage

Presents the thirteen papers presented at the symposium. The topics chosen for the symposium were: (1) agro-business processing marketing and international trade; (2) the project experience in Africa; (3) water harvesting and watershed management; (4) farming systems research; (5) herbicide application technology; and (6) marketing and managing parastatals.

285. **Eicher, J. M., Staatz, J. M. (Eds.)**. 1984. Agricultural development in the third world. Baltimore, MD: Johns Hopkins University Press. 491 p.

Agricultural development / Developing countries

A selective collection of readings on agricultural development. Articles were chosen that deal with the fundamentals of agricultural development: the role of agriculture in economic growth, intersectoral linkages, mechanisms of agricultural growth, institutional reform, functioning of factor markets, choice

of technique, and the generation and social impact of technical change. Most of the articles were written from policy rather than a model-building perspective. Designed for use as a text in beginning graduate courses in agricultural economics and rural development.

286. **Esman, M. J., Colle, R., Uphoff, N., Taylor, E.** 1980. Paraprofessionals in rural development. Ithaca, NY: Rural Development Committee, Center for International Studies, Cornell University. 149 p. (Special series on paraprofessionals no. 1).

Rural development / Paraprofessionals / Training / Management / Technology transfer / Extension

Assesses the state-of-the-art in the use of paraprofessionals as an instrument of rural development. The focus is on paraprofessionals in health, agriculture, and community development programs. However, most of the examples are drawn from health-related activities. Appendix I (pp. 107-128) deals with paraprofessionals in agriculture usually working with extending services. Suggests areas in which the potential for using paraprofessionals is the greatest.

287. **Food and Agriculture Organization of the United Nations**. 1984. Directory of agricultural education and training institutions in Africa. Rome: Food and Agriculture Organization of the United Nations. 352 p.

Agricultural education / Training / Directories / Africa

Gives detailed information on institutions of higher and intermediate level agricultural education in Africa. Also contains summary information on some additional institutions, primarily farmer training centers and other vocational training centers at the village level.

288. **Food and Agriculture Organization of the United Nations**. 1983. Follow-up to WCARRD:

The role of women in agricultural production. Rome: Food and Agriculture Organization of the United Nations. Paper presented at the Expert Consultation on Women in Food Production, Rome, Italy, 7-14 December 1983. 16 p.

Agricultural production / Women / Rural development / Developing countries

This paper was prepared initially by FAO for presentation at the Seventh Session of the Committee on Agriculture (COAG), Rome, Italy, 21-30 March 1983. It underscores the major role of women in the production, processing, storage and marketing of food staples and livestock. In the context of the World Conference on Agrarian Reform and Rural Development (WCARRD), it points out areas where FAO could assist, and is already assisting, countries to plan and carry out programs geared to the special concerns of rural women as food producers. Attention is drawn to the need to reorient programs such as extension and training, credit and marketing, and agrarian reform.

289. **Gallin, R. S., Spring, A. (Eds.).** 1985. Women creating wealth: Transforming economic development. Washington, D.C.: Association for Women in Development. 185 p.
Women / Economic development / Developing countries

Presents selected papers and speeches from the Association for Women in Development Conference, April 25-27, 1985, Washington, D.C. The volume is organized into four sections. The first section includes addresses made to several plenary sessions. The final three sections explore the conference theme — Women Creating Wealth — focusing on human, natural, and capital resources, respectively. All the studies examine the implications of the ways in which women create and use wealth and of women's lesser access to and control of resources. The concluding note synthesizes the lessons to be learned from the papers and confronts the challenges of an era of increasing economic difficulty with an agenda for the future.

290. **Gauch, P., Ben David, A.** 1983. The role of women in food production with particular reference to small animals at village level. Rome: Food and Agriculture Organization of the United Nations. Paper presented at the Expert Consultation on Women in Food Production, Rome, Italy 7-14 December 1983. 18 p. (ESH: WIFP/83/15).

Animal production / Women / Ivory Coast / Congo / Benin / Togo

In most developing countries, particularly in Africa, it is women who feed, care for, use the products and sell a range of small animals like chicken, rabbit, guinea fowl, pigeon and turkey. This paper, compiled from reports prepared by Paula Gauch and A. Ben David, explores the general features and differing purposes of women's small animal production activities and of relevant government policies and services, and goes on to detail such activities in the Ivory Coast, Congo, Benin, and Togo. It concludes by providing recommendations for further action.

291. **Gladwin, C. H.** 1985. Changes in women's roles on the farm: A response to the intensification or capitalization of agriculture. In R. S. Gallin and A. Spring (Eds.), Women creating wealth: Transforming economic development (pp. 139-142). Washington, D.C.: Association for Women in Development

Female labor / Agricultural manpower / Roles / Developing countries

Researchers of the sexual division of labor in agricultural societies generally agree that female agricultural contributions decline with agricultural intensification. In this paper, this hypothesis is also used to explain the present increase in women's farming in extensive farming systems. In addition, an alternative hypothesis is proposed that also explains changes in women's farming roles: women's agricultural contributions decline with the capitalization of agriculture and increase with its marginalization. Results from cross-cultural studies of third world societies that undergo agricultural intensification are reexamined in this light. Data from personal interviews in

6 Agricultural Development - General

North Florida are presented that show that today, women's farming contributions are increasing in the less capitalized, labor extensive part-time farming sector.

292. **Goldsmith, A. A., Blustain, H. S.** 1980. Local organization and participation in integrated rural development in Jamaica. Ithaca, NY: Rural Development Committee, Center for International Studies, Cornell University. 144 p. (Special series on rural local organization, RLO no. 3).

Organizations / Socioeconomic organization / Rural development / Social participation / Jamaica

Aims to generate empirical information on local organizations in Jamaica's rural sector. Reviews the background of the Integrated Rural Development (IRD) Project in the context of Jamaica's rural problems, describes the economy and social structure of the two areas studied, examines structure and functions of formal local organizations and the level of farmer participation in them, as well as the degree of local involvement in various government services and farmers' attitudes to the IRD Project. Discusses implications of the study for rural development in Jamaica. Uses participant-observation, interviews and a survey covering 415 people in the data collection.

293. **Graham, D. H., Bourne, C.** 1980. Agricultural credit and rural progress in Jamaica. Columbus, OH: Dept. of Agricultural Economics and Rural Sociology, Ohio State University. 27 p. (Economics and sociology occasional paper, no. 752).

Agricultural credit / Agricultural policy / Jamaica

Examines the national network of agricultural credit in Jamaica, its growth and performance and institutional change. The questions of arrears and institutional viability are discussed. The struggle between a planners' and a bankers' perspective on agricultural credit strategies has not been resolved; the

Jamaican Development Bank has not performed well, and public sector credit delivery to small farmers has been difficult. Considers alternative policies such as a package of agricultural policies that distributed inputs in kind and subsidized cost and promoted minimum price programs and marketing arrangements that would reduce the risk of income variance.

294. **Holdcroft, L. E.** 1978. The rise and fall of community development in developing countries, 1950-65: A critical analysis and an annotated bibliography. East Lansing, MI: Department of Agricultural Economics, Michigan State University. 72 p. (MSU rural development paper no. 2).

Community development / Bibliographies

Examines the community development movement in developing countries between 1950 to 1965 from a historical perspective. Describes the heavy involvement of the United States in promoting community development based on the belief that the approach provided "the democratic means to mobilize rural people" to achieve economic, social, and political development. Heavily promoted and supported through the 1950s, community development declined in the 1960s due to the disillusionment of political leaders in developing countries when programs failed to meet their goals, especially economic aims. Donor countries also withdrew funding. The paper identifies lessons learned from the movement, presents an annotated bibliography of the most influential and representative publications of the era, and provides an extensive listing of community development bibliographies.

295. **Hunter, G.** 1977. Planning and the small farmer. In Extension, planning, and the poor (pp. 42-57). London: Overseas Development Institute, Agricultural Administration Unit. (Agricultural Administration Unit occasional paper 2).

Rural development / Planning

Attempts to spell out what are the planning implications at the center of that degree of

flexibility in planning and programming at district level and below without which there is no room for initiatives and participation from the farming community itself.

296. **Jedlicka, A. D.** 1977. Organization for rural development: Risk taking and appropriate technology. New York: Praeger. 170 p. (Praeger special studies in international economics and development).

Rural development / Technology transfer / Women / Management

Provides an account of the role management plays in the effective development of the rural areas of developing countries and provides an extensive discussion of relevant managerial thinking with case-study examples illustrating the theory. Chapter 1 is an overview discussing some of the national and international constraints developing countries face in solving their rural problems. Chapter 2 discusses the theoretical background of humanistic-democratic, participative management, and explains why such management systems are especially appropriate to the organizational setting of change agencies in developing countries. Chapter 3 discusses the nature of utilizing small work groups (established in villages) as a recipient unit for technology transfer efforts by regional change agencies. Chapter 4 presents the behavioral science-based organizational structures that combine the advantages of fast communication and high participant satisfaction. Chapter 5 comments on the nature of risk and why subsistence farmers are reluctant to take risks. The final chapter deals with a wasted resource in rural development, women. Much of what is presented in the book, particularly the use of case examples, relates directly to Latin America which has been the writer's area of study.

297. **Johnston, B. F.** 1977. Food, health, and population in development. *Journal of Economic Literature*, 15, 879-907.

Economic development / Agricultural

development / Population / Nutrition / Health / Bibliographies / Developing countries

Presents a sequel to a 1970 survey on "Agriculture and Structural Transformation (*Journal of Economic Literature*, vol. 7, no. 2). Concern with the goal of reducing poverty as well as promoting growth has multiplied the options to be considered and thereby compounded the problems of choice. Section II of this paper reviews some of the alternative approaches that have been put forward. Section III examines the development literature relevant to the choice among competing alternatives. In both sections emphasis is on the likely effects of alternative development strategies in satisfying the "basic needs"--with a focus on nutrition and health--of all segments of a country's population. Section IV considers two alternatives that have been advocated to strengthen the effects of growth strategies on the level and distribution of income. The first is a target-oriented strategy aimed at the problems of small farmers. The second is a "composite package" approach to the delivery of health, nutrition, and family planning services and is therefore concerned with the "content" as well as the level of consumption.

298. **Khan, S. S.** 1981. Daudzai Community Development Project: A case-study from Pakistan. In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 1: International experience in communication and innovation (pp. 73-84). Chichester, England: John Wiley.

Rural development / Socioeconomic organization / Pakistan / Farmers' associations

Describes the most successful of five Integrated Rural Development Programme projects set up in the Northwest Frontier Province of Pakistan. Presents a detailed and frank appraisal of the projects. Cites the importance of acknowledging the needs of farmers and how villagers were motivated to initiate self-help extension programs through problem centered farmer organizations.

8 Agricultural Development - General

299. **Kinsey, B.** 1981. Monitoring large-scale agricultural development projects: Lilongwe, Malawi. In E. Clayton and F. Petry (Eds.), *Monitoring systems for agricultural and rural development projects* (pp. 59-81). Rome: Food and Agriculture Organization of the United Nations. (FAO economic and social development paper 12).

Monitoring / Development projects / Malawi / Evaluation

The Lilongwe Land Development Programme in Malawi was one of the earliest World Bank agricultural projects to operate a formal monitoring system. It is a large, agricultural development project of over one million acres, aimed at increasing crop and livestock production and providing support services including infrastructure. The monitoring activities are undertaken by a monitoring and evaluation unit, the original objectives of which were to provide information on the operation, performance and impact of the project. In practice, operation and performance alone have been monitored. Monitoring activities comprise: (1) annual farm yield surveys; (2) occasional, single visit farm management surveys; and (3) ad hoc surveys of selected operations (credit, extension, construction, etc.). The ad hoc surveys, requested by management, have been the most effective because of timely provision of data and satisfactory response of management. But the main activity of yield monitoring has been of limited value. Difficulties of measurement and late delivery of yield data, because of staffing and processing problems, have reduced its value. Because project management was not aware of the relevance of farm management data, they have not been effectively analyzed and have thus provided no useful input for project management guidance. Only parts of this complex, comprehensive monitoring system, have proved operational. Few changes have been made to design and operate the monitoring system in order to increase its cost effectiveness. Nor have attempts to explain to project staff how to make better use of the monitoring system been successful. The result has been the generation, at some cost, of much unutilized data.

300. **Martin, F. W.** 1983. Women's role in root and tuber crops production. Rome: Food and Agriculture Organization of the United Nations. Paper presented at the Expert Consultation on Women in Food Production, Rome, Italy 7-14 December 1983. 17 p. (ESH:WIFP/83/16).

Root crops / Tubers / Women

Examines women's role in the production and processing of root and tuber crops. It also looks at the effects on women's work of new technology that has been introduced, some of which are disadvantageous to women. It recommends that the planning phase of root and tuber crop programs and projects include an analysis of the role of women in both production and processing, and the social consequences, both positive and negative, that may be associated with it.

301. **McCulloch, C. S.** 1970. Some ideas on the sociology of small farming in Jamaica. In *Proceedings of the Fifth West Indian Agricultural Economics Conference* (pp. 47-51). St. Augustine, Trinidad, W.I.: Dept. of Agricultural Economics and Farm Management, The University of the West Indies.

Small farms / Social behavior / Jamaica

This paper examines some of the social characteristics of contemporary small-scale farming in Jamaica. These characteristics can be traced to the origins of the peasantry beginning in 1838 and to its subsequent neglect. Nine characteristics are analyzed: (1) poor quality land fragmentation; (2) low-farm income and part-time employment for cash wages; (3) low level of education and a dislike for agriculture; (4) farming as a way of life; (5) high degree of tenancy; (6) frustration and adjustment; (7) individualism and low-levels of co-operation; (8) inter connections; (9) resistance to change.

302. **Nicholson, N. K.** 1982. The green revolution and the rural poor in South Asia: Institutional requirement. In R. S. Anderson, P. R. Brass, E. Levy, and B. M. Morrison

(Eds.), *Science, politics, and the agricultural revolution in Asia* (pp. 463-481). Boulder, CO: Published by Westview Press for the American Association for the Advancement of Science. (AAAS selected symposium 70).

Development aid / Rural development / Institutions / Green revolution / India

This paper explores the impact of the Green Revolution on the rural poor in South Asia. From the Green Revolution planners learned important lessons about the relationships between the transformation of agriculture and poverty, peasant attitudes, and rural institutions. Discusses five types of institutional constraints which have limited the successful planning and implementation of rural development programs and projects in India. These constraints are: (a) the problem of effective demand, (b) collective action, (c) accountability and management, (d) targeting benefits, and (e) resource mobilization.

303. **Overholt, C., Anderson, M. B., Cloud, K., Austin, J. E. (Eds.)**. 1985. *Gender roles in development projects: A case book*. West Hartford, CT: Kumarian Press. 326 p.

Women / Development projects / Case studies / Developing countries / Indonesia / Tanzania / Kenya / Dominican Republic / Peru / India

Provides a set of training materials developed by the Case Study and Training Project at the Harvard Institute for International Development based on the case study method of training. Includes seven case studies based on actual country projects which received USAID funds, and four technical papers related to substantive issues on the women and development aspects of project analysis. The book is organized in two sections. The first section is a collection of papers which provide background reading in technical areas and introduce an overall framework for case analysis. The second section includes the individual cases intended for use as vehicles for group discussions. The cases include: (1) East Java Family Planning, Nutrition, and Income Generation Project in

Indonesia; (2) The Arusha Planning and Village Development Project in Tanzania; (3) Egerton College in Kenya; (4) Program for Development of Micro-Enterprises in the Dominican Republic; (5) Banco Industrial del Peru; (6) Gujarat Medium Irrigation Project in India; and (7) Kitui District Arid and Semi-Arid Lands Project in Kenya.

304. **Palmer, I.** 1985. *The impact of agrarian reform on women*. West Hartford, CT: Kumarian Press. 55 p. (Women's roles and gender differences in development, cases for planners, 6).

Agrarian reform / Land reform / Women / Small farms / Case studies / Developing countries

Presents a broad typology of agrarian reform, looking at land redistribution and producer cooperatives, land adjudication, settlement schemes, and women's own cooperative farms. It considers the effectiveness of reform strategies within a variety of agronomic and social contexts. Issues given special attention include the efficiency of small-scale farms, the role of individual rights in land, women's organizations and other vehicles for the participation of women, and the relationship between agrarian reform and health and general social welfare reforms. Provides case studies which present significant experiences in 13 countries.

305. **Palmer, I.** 1985. *The impact of male out-migration on women in farming*. West Hartford, CT: Kumarian Press. 78 p. (Women's roles and gender differences in development, cases for planners, 7).

Women / Female labor / Rural urban migration / Case studies / Developing countries

This report looks at the lives of women who remain behind in rural areas when men of the household migrate to seek employment elsewhere. It examines the importance of male out-migration on issues such as forms of productivity and output, women's rearrangement of work and income portfolios, invest-

10 Agricultural Development - General

ments in farming, exchanges between women and migrant husbands, and stresses felt by women. Discusses policy implications based on case studies drawn from southern Africa and the Middle East which take into account differing agronomic conditions, class structure, and the degree of capitalization of agriculture.

306. **Patel, A. U., Ekpere, J. A.** 1981. Strategy for agricultural development at grassroot level: A Nigerian case. In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 2: Experience in strategies for planned change (pp. 213-220). Chichester, England: John Wiley.

Rural development / Social participation / Nigeria

Provides empirical evidence of a pragmatic strategy for agricultural development at grassroot level in Nigeria. Describes a pilot project involving 26 villages in which the strategy developed is one considered appropriate for very poor agrarian societies. The Pilot Project on Rural Development (PPRD), run by Ibadan University demonstrates that indigenous groups could be encouraged to provide a village-level organizational infrastructure and the clientele participation approach to agricultural development at village level was most appropriate.

307. **Poostchi, Iraj.** 1986. Rural development and the developing countries: An interdisciplinary introductory approach. Oshawa, Ont.: Printed by the Alger Press Limited. xi, 690 p.

Rural development / Agriculture / Health / Economic development / Social change / Technology / Developing countries

A comprehensive introductory examination of topics relevant to rural development in developing countries. The text is written for students, faculty, administrators, government workers at all levels, and others who deal with rural people, rural areas, and rural projects and programs in developing countries.

Twenty-four chapters are divided into four areas, agriculture, rural health and sanitation, social and economic development, and rural technology. Such areas as crop production, rural sanitation, rural poverty, extension education, and rural energy and housing are reviewed. Information contained in the text is practical rather than theoretical in nature and is intended to inform.

308. **Pradhan, B.** 1983. Work patterns of women in food production. Rome: Food and Agriculture Organization of the United Nations. Paper presented at the Expert Consultation on Women in Food Production, Rome, Italy, 7-14 December 1983. 8 p. (ESH: WIFP/83/6).

Development projects / Women / Developing countries

Those involved in the planning and implementation of development projects often have preconceived ideas concerning the role of women in agricultural societies and miss their importance as a major source of family labor and of decision making in certain areas. Discusses development efforts that often increase the work load of women but reduce their remuneration so that their contribution to household income and their status are reduced.

309. **Rossmiller, G. E. (Ed.)** 1978. Agricultural sector planning: A general system simulation approach. East Lansing, MI: Agricultural Sector Analysis and Simulation Projects, Department of Agricultural Economics, Michigan State University. 430 p.

Agricultural development / Models / Systems analysis

Explains the general system simulation approach as a viable basis for providing input to planning and policy decision making in agricultural sector development. Discusses the philosophic orientation of the approach, its eclecticism with respect to modelling techniques and types and sources of data, its relationship to the decision-making process, and the establishment of its credibility with decision makers. Discusses the prerequisites

for institutionalization and use of the general system simulation approach for agricultural sector development planning and policy analysis within the agricultural decision structure of a national government. Details the development and institutionalization of the approach in Korea. Draws conclusions about its transferability and preconditions for its use in other developing countries.

310. **Safilios-Rothschild, C.** 1983. The state of statistics on women in agriculture in the third world. Rome: Food and Agriculture Organization of the United Nations. Paper presented at the Expert Consultation on Women in Food Production, Rome, Italy, 7-14 December 1983. 28 p. (ESI: WIFP/83/13).
Statistics / Women

This paper was originally prepared as the FAO contribution to the meeting of the Expert Group on Improving Statistics and Indicators on the Situation of Women, New York, 11-15 April, 1983, convened by the Statistical Office of the UN in cooperation with the United Nations International Research and Training Institute for the Advancement of Women. Existing methods of data collection and census survey techniques are inadequate to capture the full range of women's activities in rural production. Detailed micro-studies reveal a far greater participation than formal statistics. Greater precision in the formulation of indicators of female activity is necessary for efficient project planning.

311. **Safilios-Rothschild, C.** 1983. Women in sheep and goat production and marketing. Rome: Food and Agriculture Organization of the United Nations. Paper presented at the Expert Consultation on Women in Food Production, Rome, Italy, 7-14 December 1983. 15 p. (ESI: WIFP/83/8).
Goats / Sheep / Developing countries / Women

The keeping of small herds of sheep and goats is an important component of smallholder agriculture throughout the tropics, using

well-proven, low-input, low-labor production systems. But profitability tends to be lost as attempts are made to raise productivity through schemes which call for increased inputs invariable including greater labor inputs, especially from women.

312. **Schaefer-Kehnert, W.** 1980. Success with group lending in Malawi. *Quarterly Journal of International Agriculture*, 19, 331-337; *Development Digest*, (1982), 10-15.
Loans / Cooperative credit / Farmers / Groups / Malawi

Experience with group lending in Malawi has proved that pre-cooperative institutions can be developed successfully in poor peasant societies, even in environments where efforts to develop conventional cooperatives have failed. Group lending in Malawi can be distinguished from conventional lending approaches by the following factors: (1) the credit groups offer clearly defined economic incentives such as lower interest rates, price discounts on inputs, and relief from individual loan processing; (2) the formation of groups is left to the initiative of the farmers; government assists but does not interfere; (3) formation and disbanding of groups is simple and non-bureaucratic; (4) membership in the groups is kept small; (5) management is provided by elected group members who perform their duties principally for social prestige; (6) the field of operations is limited and simple; (7) members are fully liable for any individual default; and (8) group security against default is provided by an advance deposit which is refunded with interest at full repayment of the loan.

313. **Schultz, T. W.** 1964. Transforming traditional agriculture. New Haven, CT: Yale University Press. 212 p.
Agricultural development / Investment

The author concentrates on the economic problem confronting agriculture, presents a theoretical approach to explain the economic stagnation of traditional agriculture, and tests

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his hypotheses empirically. He identifies the sources of profitable economic growth in transforming traditional agriculture and discusses investment, including both new material inputs and investments in farm people.

314. **Singh, D. P.** 1982. Agricultural universities and transfer of technology in India: The importance of management. In R. S. Anderson, P. R. Brass, E. Levy, and B. M. Morrison (Eds.), *Science, politics, and the agricultural revolution in Asia* (pp. 165-178). (AAAS selected symposium 70). Boulder, CO: Published by Westview Press for the American Association for the Advancement of Science.

Agricultural colleges / Technology transfer / Management / India

Presents a fundamentally different point of view from that of Dr. Paul Brass in this same volume both with regard to the general applicability of the land grant model to Indian agricultural change and with regard to the specific explanations for the difficulties at the Govind Ballabh Pant University of Agriculture and Technology in Pantnagar.

315. **Southworth, H. M., Johnston, B. F. (Eds.)**. 1967. *Agricultural development and economic growth*. Ithaca, NY: Cornell University Press. 608 p.

Agricultural development

Contributors to this volume examine the interdependence between agricultural development and economic growth. The successive chapters discuss strategic aspects of the subject, drawing together what are the relevant characteristics of traditional agricultures, what their modernization requires from other sectors, and what it contributes to them. Each chapter delineates problems and points to lines of economic research critical for their solution. Economic problems of development are the central concern of the book. But experience has made clear also that development problems cannot be neatly sorted into boxes labeled technology, economic, sociology, and political sciences. The possible uses of

soils depends upon the state of economic knowledge. Land use involves politics. Food policies must take account both of nutrition and of customary patterns of consumption. Effective motivation of surplus production requires understanding the sociocultural matrix of values of farmers in subsistence economy.

316. **Spring, A., Hansen, A.** 1985. The underside of development: Agricultural development and women in Zambia. *Agriculture and Human Values*, 2, 60-67.

Women / Agricultural development / Agricultural policy / Developing countries / Zambia

The article points out the problems of transferring colonial mindsets to developing country settings and shows that these mindsets can be particularly detrimental to women. For example, land is a crucial factor of production. The colonial bias in assigning private ownership of land deprived women of access to it. The authors also argue that not only is this a problem of justice, i.e., women are deprived of the basic means they needed to produce what they always have produced in society, but it also has dire societal consequences. They maintain that women, both in the U.S. and abroad, produce primarily for home use and only sell the surplus, while men produce for the market. However, women have always been highly integrated into the market economy in many parts of Africa, and thus both their role in the market economy and home use production make it important to take women's agricultural activities into account if development programs are to succeed in maintaining or improving aggregate food production. The authors argue that policies which help small holders thereby help women, and vice versa. They suggest that policies should address both the production and reproductive work of farm women. Examples are taken from the Luvale-speaking peoples of northwestern Zambia.

317. **Spring, A., Smith, C., Kayuni, F.** 1983. *Women farmers in Malawi: Their contributions to agriculture and participation in*

development projects. Washington, D.C.: USAID, Office of Women in Development. 80 p.
Women / Farmers / Development projects / Rural development / Malawi

Section 1 outlines the extent of the participation of women in agriculture in Malawi, particularly with respect to small-holders. Section 2 covers research on women in agriculture. Section 3 summarizes ways in which women farmers in Malawi are included in rural development project proposals. Section 4 discusses project services to rural women including general extension activities, credit and training.

318. **Staudt, K. A.** 1976. Women farmers and inequities in agricultural services. *Rural Africana*, 29, 81-94.

Agricultural policy / Women / Kenya / Extension

Women farmers experience a persistent and pervasive bias in the delivery of agricultural services in Africa. This study provides empirical data of 212 small-scale farm households in Kakamega District of western Kenya. Women traditionally have done much of the agricultural labor; they were responsible for digging, planting, weeding, and harvesting. Men traditionally cleared the land, plowed with oxen, and cared for cattle. Women engage in extensive associational activity. Men, in contrast, attend barazas, where agricultural information, or demonstrations are occasionally given by the extension staff. While women are not prohibited from attending barazas, they rarely do so because of custom and lack of time. The author concludes that the bias against women increases in intensity as the value of the service increases and it makes no difference whether the women have high economic status, large farms, or have shown willingness to adopt agricultural innovations. Yet despite these inequities women managers appear to be as productive and as adoptive as male farmers.

319. **Stockhausen, J. Von.** 1982. Credit groups and rotating savings and credit

associations - different financial technologies? *Quarterly Journal of International Agriculture*, 21, 155-172.

Agricultural credit / Producer groups / Malawi

The recent search for appropriate "financial retailers" for the development of rural economies has directed more attention to credit groups and the traditional rotating savings and credit associations (ROSCAs). In both cases this involves self-help groups with a comparatively small number of members. The example of the "farmers' clubs" in Malawi makes it clear that the character of a small group is secured by a sort of "cell-division" whereby a cell group system develops which, in answer to environmental changes, helps to stabilize the overall social system. A comparison of credit groups and ROSCAs make it clear that in both cases there are similar mechanisms for integrating and stabilizing the small group.

320. **Uphoff, Norman.** 1985. Fitting projects to people. p. 359-395. In Michael M. Cernea (Ed.), *Putting people first: Sociological variables in rural development*. New York: Oxford University Press.

Rural development / Planning / Implementation / Nepal / Ghana / Mexico

Considers three integrated rural development projects in Nepal, Ghana, and Mexico from the perspective of inputs from intended beneficiaries and the problems attendant upon "top-down" approaches to rural development. A close working relationship throughout the project cycle between planners and the local population is advocated. Problems with the "nonparticipatory" approach are analyzed in terms of project components, agricultural targets, technical choices, and implementation. General conclusions about what people can contribute to the planning and implementation of projects are drawn. Also discussed is how, with the benefit of sociological theory and bureaucratic practices, projects can be better carried out to put people first.

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321. **Uphoff, N. T. (Ed.).** 1982. Rural development and local organization in Asia. Delhi: Macmillan India. 3 v.

Rural development / Organizations / Asia / Case studies / India / Pakistan / Bangladesh / Sri Lanka / China / Japan / Taiwan / Korea Republic / Indonesia / Malaysia / Philippines / Thailand

The most prominent strategies for rural development have emphasize employment of new technologies or increased investment of resources. Much less attention has been given to the role of institutions, particularly at the local level. This three volume set attempts a comparative study of the rural development experience and the role of local organization in this process in 12 Asian countries. Volume 1 is concerned with the South Asian countries of India, Pakistan, Bangladesh, and Sri Lanka. The Indian case study includes an examination of the experiences of 'modal' state (Andhra Pradesh), a state with rapid agricultural growth (Punjab), and a state with an interesting experiment of decentralization (Rajasthan). The case study of Pakistan deals with that country's experience of Basic Democracies, and those of Bangladesh and Sri Lanka with their institutional experiments and experience. Volume 2 covers the experiences of the East Asian countries of China, Japan, Taiwan and South Korea—countries which have been very successful in rural development efforts. In all four cases the systems of local organization are more expensive and intensive than elsewhere in Asia, engaging the rural people thoroughly in development strategies. Volume 3 covers the experience of South East Asian countries—Indonesia, Malaysia, Philippines and Thailand. It concludes with a comparative analysis of the various kinds of Asian experience with local organization and rural development.

322. **Vallianatos, E. G.** 1976. Fear in the countryside: The control of agricultural resources in the poor countries by nonpeasant elites. Cambridge, MA: Ballinger. 180 p.

Agricultural development / Small farms / Developing countries / Infrastructure

A central thesis of the book is a successful solution to the problems of social and economic exploitation of the rural classes of the developing world by their own elites, frequently professional, technocratic and land-owning holdovers of colonial days. It presents an historian's view of the world food problem, and the continuing struggles of the small farmers and landless laborers of the Third World against social and economic injustice and imbalances. In their reactions to the possibilities of agricultural improvement through the application of modern science and technology, poor farmers' behavior is governed as much by their fear of failure as by the prospects for increased production ("risk aversion" in economic analysis). The reality is that the poor farmer is barely able to grow enough food for himself and his dependents, even in good years. He cannot, therefore, take a chance on new methods that have not been tested by his own experience. More significantly, his farming is a micro-system, the safety of diversity of which must be balanced against the vastly increased production that could be obtained by concentrating on one crop at a time using modern inputs. Unless there is an adequate infrastructure of inexpensive transport, stable water supplies, equitable marketing arrangements, credit on fair terms, security of land tenure, and prices for his farm products that more than balance the costs of fertilizers, irrigation water and other purchased inputs, the small farmer has little reason to change his traditional ways. New strategies geared to encouraging social change, the transfer of appropriate technologies and the strengthening of the role of the small farmer are needed to counteract current policies which are almost dramatically opposed to such strategies.

323. **Wolff, L.** 1983. The Lesotho distance teaching centre. In education and agricultural extension: Costs, effects, and alternatives (pp. 249-285). Washington, D.C.: World Bank. (World Bank staff working papers no. 564).

Education / Lesotho / Rural areas

Describes the functions of the Lesotho Distance Teaching Center and its on-going

programs for reaching the rural population of Lesotho. It concludes by attributing the Centre's comparative success to its autonomy,

to its dedication, to its mandate of improving the life of rural people, and to its willingness to engage in self-criticism.

Policy and Planning

324. **Bale, M. D.** 1985. Agricultural trade and food policy: The experience of five developing countries. Washington, D.C.: World Bank. 40 p. (World Bank staff working papers, no. 724).

Agricultural policy / Price policy / World Bank / Incentives / Colombia / Jamaica / Nigeria / Pakistan / Philippines / Developing countries

Identifies problems in the policy making process and the various constraints to the growth of the agricultural sector. Reviews recent World Bank studies on agricultural pricing and trade policy in developing countries. Profiles the experience of five countries — Colombia, Jamaica, Nigeria, Pakistan, and Philippines. Addresses a number of questions to gain a better understanding of the incentives or disincentives to agriculture that exist in the particular political economy of the country. Summarizes the techniques used to analyze trade and pricing policies and describes common sources of disincentives in agriculture.

325. **Burfisher, M. E., Horenstein, N. R.** 1985. Sex roles in the Nigerian Tiv farm household. West Hartford, CT: Kumarian Press. 62 p. (Women's roles and gender differences in development, cases for planners, 2).

Farming systems / Planning / Agricultural productivity / Women / Methodology / Development projects / Infrastructure / Nigeria / Case studies

Presents an example of the application of farming systems methodology differentiating labor requirements, income, and financial responsibilities by gender, revealing the different demands and incentives structures facing each sex with the introduction of new crop practices. Reevaluates the design of a project that aimed to improve the agricultural productivity of the "middle belt" of Nigeria, of which half the population are the Tiv. Disaggregating for gender, the study shows that the Tiv do not operate as a unified household and thus questions whether the

project will work as the designers intended. Questions of market access, credit, cooperative membership, project plans for reforestation, roads, and well building, and their relevance to women are also touched upon. In addition, the study provides a planning methodology for agricultural development projects that takes into account relevant sex-role differences in the farm household.

326. **Elias, V. J.** 1981. Government expenditures on agriculture in Latin America. Washington, DC: International Food Policy Research Institute. 67 p. (Research report 23).

Agricultural production / Agricultural policy / Public expenditure / Agricultural development / Latin America

Presents estimates of aggregate government expenditures directed to the rural sectors of nine Latin American Countries: Argentina, Bolivia, Brazil, Chile, Costa Rica, Colombia, Mexico, Peru, and Venezuela during the period from 1950 to 1978. Identifies government expenditure policies for the agricultural sector in Latin America; measures their importance in relation to total government output; analyzes their trend and variability throughout the time period and from country to country; and begins to study their effects on agricultural production. Although the study is mostly descriptive, it presents some measurements of the behavior of government expenditure policies. A number of conclusions can be drawn from the data: (1) the trend of expenditures on agriculture has risen sharply (8% p.a.) especially since 1964 in every country except Argentina; (2) agriculture's share of GDP has declined steadily in every country except Chile; (3) the share of government expenditures on agriculture in the total government budget averaged 5% ; and (4) government expenditure policy is responsible for at least 10% of the growth of agricultural output.

327. **Fishel, W. L. (Ed.)** 1971. Resource allocation in agricultural research. Minneapolis: University of Minnesota Press. 391 p.

Agricultural research / Resource allocation

Part I of this five part book consists of a general review by P. J. Tichenor and V. W. Ruttan. Part II, Research and welfare, includes papers by L. G. Tweeten, D. Kaldor, A. Paulsen, T. W. Schultz, and E. O. Heady. Part III presents three papers covering most of the empirical work that has been done on investments in agricultural research by Peterson, R. Evenson, and F. Welch. The subject area of Part IV is research resource allocation decision making in practice. Hurter and Rubenstein examine private research and development decisions. M. McGregor describes the decision processes involved in budget allocation activities between the U.S. Bureau of the Budget and the U.S. Department of Agriculture. Bayley deals with decision making within the USDA. Robinson contends that the relative stability of U.S. experiment station expenditure indicates a lack of response to changing needs and Mehren generally reviews resource allocation and planning in agricultural research. The final section contains six papers outlining actual decision-making experiments in the U.S. Schiek describes the U.S. Bureau of the Budget's planning, programming and budget (PPB) system; Williamson questions the wisdom of objective analysis at present; Meyer describes the Californian responsive budget system which is essentially similar to PPB; and Mahlstede describes long range planning at Iowa experiment stations. The final paper by W. L. Fishel describes the Minnesota Agricultural Research Resource Allocation Information System (MARRAIS).

328. **Hinderink, J., Sterkenburg, J. J.** 1985. Agricultural policy and the organization of production in Sub-Saharan Africa. *Journal of Rural Studies*, 1, 73-85.

Agricultural production / Agricultural policy / Africa

In spite of differences in development ideology between African countries, there is much similarity in their agricultural development policies, with output growth through increasing commercialization as the main policy objective. The article identifies the common policy characteristics and analyzes

their effects on commercialization and organization of production in order of the intensity of government intervention. This implies attention for agro-industrial complexes, private estates, commercial peasant farms, various types of schemes, collective production units, and state farms, respectively. Although intensification of government intervention usually leads to higher costs and lower levels of production and productivity, the solution to Africa's present agricultural crisis is not so much the choice of one specific type of production unit, but rather the improvement of the general production environment as reflected in adequate producer price levels, reinvestment of creamed-off surpluses and an effective service apparatus, with the benefits of growth distributed over wide segments of the rural population.

329. **Idachaba, F. S.** 1980. Agricultural research policy in Nigeria. Washington, D.C.: International Food Policy Research Institute. 70 p. (Research report 17).

Agricultural research / Research policy / Resource allocation / Nigeria / National research programs

Examines agricultural research priorities in Nigeria, a relatively large food-deficit country, and the ability of agriculture to meet the country's requirements in the next three decades. Specifically, the study reviews the evolution and achievements of agricultural research; examines resource allocations to agricultural research for the various crops; and compares the amount of research resources allotted to export and food crops, livestock, forestry, fisheries, rain fed and irrigated agriculture, agricultural production, inputs, and multi-disciplinary systems; and the allocation of research facilities by region. Identifies major research needs in the light of available capabilities. Indicates the aspects of the Nigerian political and economic policies that affect the efficiency of the national agricultural research system. Finally the report suggests policy recommendations for Nigeria that are relevant to other developing countries.

330. **Johnston, B. F., Clark, W. C.** 1982. Redesigning rural development: A strategic perspective. Baltimore, MD: Johns Hopkins University Press. 311 p. (The Johns Hopkins studies in development).

Rural development / Development policy / Development projects / Developing countries / Organizations

Presents a policy analysis of rural development in the late-developing countries. Written for practitioners and students of development who seek a strategic perspective from which to reflect on what they and their colleagues are doing. Focuses on specific interventions in three key program areas: (1) production-oriented interventions, dealing with rural employment opportunities and agricultural development; (2) consumption-oriented interventions, dealing with health, nutrition, and with institutional structures and managerial procedures. It analyzes the historical performance of policies in these program areas, identifies the competitive and complementary relationships among them, and discusses how they can be combined to design feasible and effective strategies for rural development. Chapter 1 establishes the authors' point of view. It draws on the experience of policy analysis in other fields to illuminate what is called the "development debate". It argues that the development community has failed to learn from experience, repeating the same mistakes over and over again. It explores why this is so and reflects on what is going on in contemporary efforts to redesign rural development. Chapter 2 defines the few key dimensions of development problems on which the book focuses. Chapter 3 reviews experience from production-oriented programs and chapter 4 from consumption-oriented programs. Chapter 5 discusses the prospects of meeting the organizational demands, focusing on two particularly important areas to organize the "facilitators", the civil servants and field staff who must link national plans to local actions. The final chapter reviews the often ambiguous evidence regarding trade-offs and complementarities among these component programs. The book concludes with some speculations on feasible and desirable directions for the

continuing redesign of rural development strategy.

331. **Lipton, M.** 1975. Urban bias and food policy in poor countries. *Food policy*, 1, 41-52.

Food policy / Agricultural policy / Agricultural production / Developing countries

Unprecedented post-war growth has done little to alleviate poverty, or therefore, hunger. The author argues that this is mainly because urban bias has led to inadequate, ill-directed and maldistributed farm inputs. Planning in particular has been directed, by normal processes of politics and not by malice, towards eliminating not hunger but food imports; and towards unbalancing output structures to meet rich townsmen's growing demands--milk before millet. Presents an alternative planning against hunger which would include policies to raise the share of national effort in, and to improve the distribution and structure of inputs for food production; to restructure and relocate calorie consumption; and to alter priorities in research and trade.

332. **Oram, P., Zapata, J., Roy, S., Alibaruho, G.** 1979. Investment and input requirements for accelerating food production in low-income countries by 1990. Washington, D.C.: International Food Policy Research Institute. 179 p. (Research report 10).

Investment policy / Food policy / Agricultural production / Developing countries

Presents a study of the investment requirements needed by 36 low-income food-deficit countries to accelerate their food production in order to close the projected gap between third world production and consumption. Clearly demonstrates how massive increases in investment are not only required in irrigation, roads and electrification, but also in research, extension and other institutional type forms. The study provides judgments, based on national and regional potentials for production increases, of how production increases are to

be achieved. These include the roles of irrigation, improved rain fed agriculture, new technology and land settlement schemes. In the presentation it becomes clear that the solution and the approaches for one region may necessarily differ from those of another.

333. **Palmer, I.** 1985. *The Nemow case*. West Hartford, CT: Kumarian Press. 53 p. (Women's roles and gender differences in development, cases for planners, 1).

Development projects / Planning / Case studies / Women / Evaluation / Developing countries

Presents a prototype study for others in the series, *Women's Roles and Gender Differences in Development, Cases for Planners* prepared by the Population Council. The study draws on data from a variety of field experiences and consolidates them into a single hypothetical case. The study looks at eight objectives in a project to improve rice and fish yields and thereby increase marketable surplus. The findings demonstrate that weaknesses in the project's performance in production, income, distribution, education, and health and nutrition are a direct result of its failure to address the specific roles and needs of women.

334. **Schultz, T. W. (Ed.)** 1978. *Distortions of agricultural incentives*. Bloomington, IN: Indiana University Press. 343 p.

Agricultural policy / Distortion / Incentives / Agricultural research / Constraints / Developing countries

A collection of papers presented at a three-day workshop sponsored by the Midwest Center of the American Academy of Arts and Sciences. Advances in scientific knowledge and new infusions of capital have led to substantial reductions in physical and biological constraints on food and agricultural production in low-income countries. But from a political standpoint, prospects for increased food production at lower costs, e.g. a Green Revolution, are far less encouraging. The

book presents the latest thinking about the economic interests and reveals that the dominant adverse effect is the distortion of economic incentives. The essays suggest that when the political market suppresses the entrepreneurial role of farmers, countries do not modernize agriculture efficiently. Thus, in many developing countries, food prices are kept artificially low at the expense of farmers. Food shortages result, and future shortages are a certainty. In addition, agricultural research tends to be thwarted, especially in former colonial nations, by governments that under-value crop production, giving top priority instead to industrialization because they believe it is the linchpin of economic growth. The book is divided into six parts, each of which is devoted to a major problem area. Essays within each part discuss aspects of the problem. Most are followed by comments by one or more of the contributors. The main subject headings are: (1) constraints on agricultural production; (2) resources and environment; (3) distortions of incentives; (4) international markets; (5) agricultural research, education, and new institutions; and (6) the quest for equity.

335. **Staudt, K.** 1985. *Agricultural policy implementation: A case study from Western Kenya*. West Hartford, CT: Kumarian Press. 68 p. (Women's roles and gender differences in development, cases for planners, 3).

Agricultural policy / Extension / Women / Infrastructure / Kenya / Case studies

Reviews the differential impact of agricultural extension policy in the 1970's on female managed and jointly managed farms in the Kakamega District in Western Kenya by looking at three levels of implementation: (1) ordinary; (2) intensified; and (3) saturated. The Kenya case documents the existence and effect of bias against women in the delivery of services despite women's predominance as farmers and food providers. Suggests ways in which service delivery to women could be improved, primarily through outreach to women's groups, alternatives to land ownership (from which women have largely been excluded

in the course of land registration) for collateral, for credit and own or joint membership in cooperatives.

336. **U.S. Congress. Office of Technology Assessment.** 1984. *Africa tomorrow: Issues in technology, agriculture, and U.S. foreign aid — A technical memorandum.* Washington, D.C.: U.S. Congress, Office of Technology Assessment. 145 p.

Food policy / Agricultural development / Africa / Small farms / Technology development / Technology transfer

The greatest potential for significantly expanding Africa's food production lies in increasing the productivity of small subsistence-level farmers and herders who raise most of Africa's food and yet have been largely ignored. The challenge is to devise research, extension and aid programs that involve local people and integrate on-farm work into the larger framework of national and international efforts. Concludes that the primary responsibility for improving food production lies with the African governments themselves. Suggests that the U.S. provides increased support to indigenous African universities and research centers and encourage programs in which farmers, herders, extension agents, and agricultural researchers work together. Some

of the conclusions refer to the role of women in African agriculture, private and voluntary organizations in U.S. aid to Africa, the need to revise present USAID efforts, the role of food aid and its potential negative consequences, the level of institutional development, and African extension services.

337. **Weiss, Jr., C.** 1979. Mobilizing technology for developing countries. *Science*, 203, 1083- 1089.

Policy / Technical progress / Developing countries / Economic resources / Social anthropology / Manpower

A new problem in technology policy—a discipline hitherto largely concerned with the modern industrial sector—is posed by the need for technology suited to creating productive jobs and providing minimum public services at a cost and level of sophistication within the reach of poor people in developing countries. Careful consideration must be given to overall and sectoral development objectives, economic and manpower resources, and the local institutional and sociocultural context. This may indicate the need for both hardware innovation, such as low-cost alternatives to waterborne sewerage, and social ("software") innovation, such as training large numbers of supervisors to implement improved technologies for labor-intensive civil works .

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338. **Adeyemo, R.** 1984. Agricultural research in Nigeria: Priorities and effectiveness. *Agricultural Administration*, 17, 81-91.

Agricultural research / Nigeria

Focuses on agricultural research in Nigeria and specifically discusses major agricultural research priorities and criteria for investigating effective agricultural research. Stresses that Nigeria cannot afford to support research into all the necessary problems awaiting solution. Neither can she afford the luxury of research for its own sake. However, there are major agricultural areas that need attention such as: food, export crops, livestock and fisheries development, farm incomes and a stable economy. The study considers the major criteria for effective and successful agricultural research in Nigeria. It indicates that agricultural research programs: (1) must maintain accountability to the public; (2) must be coordinated internally within, and between, disciplines and between organizations; (3) must maintain relevance to peoples' needs; (4) require flexibility and innovative approaches for continued improvement and shifting emphases; and (5) must possess sound means of evaluation in which performance, not research activity, is the criterion for the continuation of support.

339. **Alleyne, E. P.** 1975. Training and management policy for agricultural research scientists in the governmental system: A study in two Caribbean states -- Trinidad and Tobago, and Jamaica. Ann Arbor, MI: University of Microfilms International. Dissertation Abstracts International, 36, 5748A. 385 p. (University Microfilms no. 76-5894).

Agricultural research / Management / Research policy / Public sector / Trinidad and Tobago / Jamaica

Seeks to determine existing problems related to management policy for agricultural research within the governmental system in developing countries. Includes data relating to organizational structure within the governmental system such as recruitment and training

policy, level of support and development opportunities, internal management, allocation of rewards, accountability and project teamwork. Deficiencies were identified which could be used for redesigning and executing an efficient management policy for agricultural research scientists.

340. **Anderson, R. S.** 1982. Removing the limitations on science: On the responsibilities of rice research in Bangladesh. In R. S. Anderson, P. R. Brass, E. Levy, and B. M. Morrison (Eds.), *Science, politics, and the agricultural revolution in Asia* (pp. 323-370). Boulder, CO: Published by Westview Press for the American Association for the Advancement of Science. (AAAS selected symposium 70).

Agricultural research / Rice / Bangladesh

Describes the role of scientists and a research institute, the Bangladesh Rice Research Institute (BRRI), in the high-yielding variety (HYV) strategy intended to solve the problem of self-sufficiency. Examines the difference between the stated goals and the actual performance of the HYV strategy and discusses the limitations on the performance and contribution of BRRI in terms of the objectives of its scientists and their international supporters. Finally, the author proposes changes in BRRI's relations with the broad mass of rice cultivators and in its central organization.

341. **Arndt, T. M., Dalrymple, D.G., Ruttan, V. W. (Eds.)** 1977. Resource allocation and productivity in national and international agricultural research. Minneapolis, MN: University of Minnesota Press. 617 p.

Agricultural research / Resource allocation / Research policy / National research programs / Organizations / Management

Presents 28 papers from an international conference held at Airlie House, Virginia in January 1975. The conference had two main objectives: (1) to examine recent evidence on the returns to investment in national and international agricultural research systems; and

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(2) to explore the relevance of social and economic factors for the organization and management of national and international research systems. Technical issues related to the measurement of research productivity, the planning of research programs, and the management of research systems are also discussed. The first section of the book is devoted to a series of studies of the productivity of national research systems in both developed and developing countries. The second section includes three papers on the productivity of international research systems. The third section is devoted to the organization and development of the international agricultural research institute system. The fourth section is devoted to issues bearing directly on the organization and management of agricultural research systems. The fifth section examines the role of economic and social factors in research resource allocations. The final section is devoted to discussion of the research strategy and management issues that will affect the future of the international research system and the productivity of national research systems.

342. Asian Productivity Organization. 1983. *Agricultural research management in Asia: Report of a study meeting.* Tokyo: Asian Productivity Organization. 242 p.

Agricultural research / Management / National research programs / Taiwan / Fiji / India / Indonesia / Korea Republic / Japan / Malaysia / Nepal / Philippines / Sri Lanka / Thailand

Presents the country reports and a summary of the findings from the Study Meeting on Agricultural Research Management organized by the Government of Japan from 24th June through 2nd July, 1983. The discussion sessions and country reports focussed on four major topics: (1) Institution Building and Agricultural Research Systems; (2) Process and Performance of Agricultural Research; (3) Human Aspects of Agricultural Research; and (4) Major Problems and Areas for Improvement of Agricultural Research. Country reports were presented by participants from Republic

of China, Fiji, India, Indonesia, Republic of Korea, Malaysia, Nepal, Philippines, Sri Lanka, and Thailand. The discussion sessions were prefaced with a report on the status of agricultural research management in Japan.

343. Bangladesh Agricultural Research Council, International Service for National Agricultural Research, Winrock International Institute for Agricultural Development. 1985. *Evaluating agricultural research programs.* Report of the regional workshop on research program held October 1-3, 1984 in Dhaka, Bangladesh. Dhaka: 133 p.

Technology development / Evaluation / Planning / Implementation / Developing countries / Asia / Bangladesh / Indonesia / Malaysia / Nepal / Pakistan / Sri Lanka / Thailand

Presents the papers of the Regional Workshop on Research Program Evaluation held in Dhaka, Bangladesh. Includes the theme papers, the country reports, and summary of the technical sessions. Valuable for the national agricultural research of Bangladesh and other developing countries. Emphasizes three points: (1) research program; (2) internal and external regular monitoring procedures; and (3) the importance of evaluation for planning future activities, justifying future investments and assessing current achievements.

344. Banta, G. R. 1982. *Asian cropping systems research: Microeconomic evaluation procedures.* Ottawa, Ont.: International Development Research Centre. 56 p. (IDRC - 197e).

Farming systems / Methodology / Farm management / Decision making / Systems analysis / On-farm testing / Evaluation / South East Asia / Case studies / Microeconomic analysis / Agricultural research

Analyzes the microeconomic component of cropping systems research in Southeast Asia. Examines the program of the Asian Cropping Systems network and the role of the Interna-

tional Rice Research Institute. The objectives of the study were to describe the cropping systems research approach, with emphasis on the economic component and the role of the agricultural economist, and to develop informal economic analysis procedures that could be used by team economists on their respective research sites. Delineates a set of informal procedures developed to utilize the case study approach in evaluating profitability of the new technology. These informal procedures involved partial budgeting, graphing for resource constraints, and program planning. The informal procedures were found to be less precise but equally accurate in predicting the acceptability of new technology arising out of farming systems research in the farm environment.

345. **Binswanger, H. P., Virmani, S. M., Kampen, J.** 1980. Farming systems components for selected areas in India: Evidence from ICRISAT. Patancheru, Andhra Pradesh, India: ICRISAT. 40 p.
(Research bulletin no. 2).

Farming systems / Water management / Soil water relations / India

Summarizes conclusions that can be drawn from seven years of soil and water management research in the Farming Systems Program of ICRISAT, as well as selected conclusions from other programs and subprograms at the center. It clearly states findings that need to be evaluated on farmers' fields. It also indicates areas of further research that need continuing intensive investigations and evaluations.

346. **Binswanger, H. P., Barah, B. C.** 1980. Yield risk, risk aversion, and genotype selection: Conceptual issues and approaches. Patancheru, Andhra Pradesh, India: ICRISAT. 25 p. (Research bulletin no. 3).

Risks / Yields / Uncertainties / Statistical analysis / Methodology

Discusses several methods of stability and adaptability analysis where stability has a risk

connotation. For risk analysis the authors have proposed to measure stability by standard deviation and risk preferences by the tradeoff between standard deviation and mean yield. This leads to a unique preference-based ranking for choosing among genotypes for decision makers with given risk preferences. This ranking takes into account both temporal stability and mean yield. Proposes a practical way of measuring risk with several years of coordinated yield trial data. Demonstrates why the joint regression approach to stability analysis cannot be used in the context of a stability analysis in the risk sense. The proposed analysis is subject to a certain amount of nursery and region specificity and the authors explore regression approaches on plant independent variables to overcome this problem. The approach has potential that has not so far been realized. Finally, the paper discusses the relationship of stability and adaptability in the context of the regression framework.

347. **Brady, N. C.** 1977. The International Rice Research Institute (IRRI) outreach program. In T. M. Arndt, D. G. Dalrymple and V. W. Ruttan (Eds.), Resource allocation and productivity in national and international agricultural research (pp. 295-305). Minneapolis, MN: University of Minnesota Press.

International agricultural research centers / National research programs / Agricultural research

Summarizes the program at the International Rice Research Institute for stimulating and collaborating forces to improve the quality and output of national research programs. Describes the collection of germ plasm, publications, conferences, symposia, and workshops, training, IRRI's cooperative programs, operational constraints, and what is in the future for cooperative relationships between international research centers and country agencies.

348. **Centro Internacional de Mejoramiento de Maiz Y Trigo, International Service for**

National Agricultural Research. 1984. Issues in Organization and management of research with a farming systems perspective aimed at technology generation. Proceedings of a workshop, The Hague, Netherlands September 27-30 1983. 74 p.

Farming systems / Technology development / Research / Implementation of research / Management / Nigeria / Panama / Ecuador

Includes presentations for farming systems and technology generation. Presentations were made by Winkelmann on Farming systems, Coulter on Activities of Development Agencies in Support for Farming Systems Research, Paez et al. on the Concepts and Implementation of Farming Systems Research at the Tropical Agricultural Research and Training Center (CATIE), Abalu on experiences from Nigeria, Tarte on experiences in Panama, Funagalli on the Agricultural Science and Technology Institute (ICTA), Delgado on experiences in Ecuador, and Dagg on Framework for Organization and Management of Agricultural Research.

349. **Cernea, M. M., Coulter, J. K., Russell, J. F. K. (Eds.)**. 1985. Research-extension-farmer: A two-way continuum for agricultural development. Washington, D.C.: The World Bank. 171 p.

Research / Extension / Farmer / Agricultural development / Innovations / Linkages / Asia

Reviews and analyzes actual experiences - successes and failures - with linking research and extension in several Asian countries. Addresses four main themes: policy and institutional issues of building up the linkage between research and extension; the identification of farmers' production problems; the generation of improved technology and its on-farm validation; and the formulation of extension recommendations. Researchers from India, Indonesia, Pakistan, the Philippines, Sri Lanka, Thailand and elsewhere have participated. They argue that technological know how can best be incorporated into various

farming systems if extension is used to create a continuum between research and the farmer.

350. **Chambers, R., Ghildyal, B. P.** 1985. Agricultural research for resource-poor farmers: The Farmer-First-and-Last Model. Brighton, England: Institute of Development Studies, University of Sussex. 29 p. (Discussion paper DP 203).

Agricultural research / Small farms / On-farm testing / Technology transfer / Models

Rural poverty is much less a problem of total food availability than of who produces the food and who has the income to buy it. A high priority is therefore to enable the tens of millions of resource-poor farm families to increase their production and improve its stability. The normal "transfer-of-technology" (TOT) model for agricultural research has built-in biases which favor resource-rich farmers whose approaches have been modified through on-farm trials and demonstrations but the basic model and approach remain the same. A second emerging model is "farmer-first-and-last" (FFL). This starts and ends with the farm family and the farming system. It begins with a holistic and interdisciplinary appraisal of farm families' resources, needs and problems, and continues with on-farm and with-farmer R and D, with scientists, experiment stations and laboratories in a consultancy and referral role. FFL fits the needs and opportunities of resource-poor farm families better than TOT, but there are obstacles to its development and introduction. These can be tackled step-by-step, through combinations of methodological innovation, interdisciplinary participation including the social sciences, and provision of suitable resources, rewards and training. FFL approaches promise a greater contribution from agricultural research to the eradication of rural poverty.

351. **Cooper, C.** 1980. Policy interventions for technological innovation in developing countries. Washington, D.C.: World Bank. 59 p. (World Bank staff working paper no. 441).

Innovations / Technical progress / Developing countries / Development policy

Assesses the potential social payoff of alternative measures that might be taken to promote innovation in developing countries. Concerned with the general issues of encouraging technical innovation in the nonagricultural sectors. Part 1 discusses the process of innovation and describes the skills associated with it. Part 2 sets forth some of the special problems that developing economies encounter in building up innovative skills. Part 3 draws together some of the main implications for policy and explains how priorities for the development of local innovative activities might be determined. Part 4 analyzes the patterns of innovative activity that might be needed in developing economies. Part 5 summarizes the main conclusions and suggests some of the implications of adopting an approach that stems from these conclusions—in different national circumstances.

352. **Dahlman, C. J., Ross-Larson, B., Westphal, L. E.** 1985. *Managing technological development: Lessons from the newly industrializing countries.* Washington, D.C.: World Bank. 55 p. (World Bank staff working papers, no. 717).

Technology development / Technical progress / Information flow / Developing countries

This survey looks at the technological development of the newly industrializing countries and draws some important lessons for firms and governments in other developing countries. Summarizes the technological problems of a developing country by considering the following questions: (1) How, where, and at what cost should a country acquire the technology it needs and accumulate the capabilities to use technology effectively? (2) How can technology and technological capability be diffused? (3) How best can the country use the technology it already has? Describes the technological development of an archetypal successful firm and uses the description to introduce some basic concepts about managing

technological development. Discusses the primary elements that shape the economic environment—incentives and penalties, specialized technological agents that promote the flow of information, and the role of government when markets fail.

353. **Daniels, D., Nestel, B. (Eds.)** 1981. *Resource allocation to agricultural research: Proceedings of a workshop held in Singapore, 8-10 June 1981.* Ottawa, Ont.: International Development Research Centre. 178 p.

Agricultural research / Policy / Resource allocation / Methodology / Kenya / Thailand / Nepal / Malaysia / Pakistan / Colombia / Philippines / Nigeria / Peru / Bangladesh / Brazil / Argentina / Indonesia

Presents the papers and a summary of discussions from the workshop held in Singapore. The objectives were to: (1) review national inventory studies and assess their value; (2) explore existing allocation systems in developing countries and suggest possible improvements; and (3) identify further work that should be carried out to improve resource allocation. The papers are divided into four sections: (1) country inventories with studies of agricultural research resource allocation in Kenya, Thailand, Nepal, Malaysia, Pakistan, and Sri Lanka; (2) defining priorities with cases from Colombia, the Philippines, Nigeria and Peru; (3) allocating resources with examples from Kenya, Bangladesh, Brazil and Malaysia; and (4) developing human resources with studies from Colombia, Argentina, Peru, Indonesia and Bangladesh.

354. **de Janvry, A., Dethier, J. J.** 1985. *Technological innovation in agriculture: The political economy of its rate and bias.* Washington, D.C.: The World Bank. 89 p. (Consultative group on international agricultural research study paper no. 7).

Technology development / Agricultural research / Economic resources / Latin America

Examines the role of market and non market forces in affecting the rate and bias of

technical change in agriculture. Analyzes the process of generation of innovations and investment in agricultural research. Examines the political economic factors, the sources of duration from the equilibrium rate and the commodity bias in research. Argues that: (1) a theory of the rate and bias of technological innovation must go beyond the analysis of market forces because they explain only a small part of changes in investment and productivity in agriculture; and (2) the roles played by the various actors involved in agricultural research e.g., the state and the National Research Institutes (NRIs), the International Agriculture Research Centers (IARCs), and the private sector are being redefined as research moves into the "Post Green Revolution" period. Empirical evidence in support of these arguments is still fragmentary. Attention has mainly focused on Latin America.

355. **Denning, G. L.** 1984. Integrating farming systems research with agricultural extension programs. Manila, Philippines: Training and Technology Transfer Department, International Rice Research Institute. 69 p.

Technology development / Farming systems / Technology transfer / Linkages / Adaptation / Methodology

Discussion paper prepared for the Asian Workshop on Agricultural Research/Extension Linkages, March 18-24, 1984, Denpasar, Bali, Indonesia. The discussion in the paper follows the classical farming systems research sequence commencing with the identification of priority areas for development, then proceeds through several technology testing and evaluation steps to the production program for which the Training and Visit System is assumed to be the prime extension methodology being employed. Several examples are given from the International Rice Research Institute's work in cropping systems research methodology.

356. **Ecuadorian Ministry of Agriculture, United States Agency for International Development.** 1979. Baseline study of

agricultural research, education, and extension in Ecuador. Quito, Ecuador: Ecuadorian Ministry of Agriculture. 208 p.

Agricultural research / Extension / Agricultural education / Ecuador

Presents the findings and recommendations of a review team to study the agricultural research, education, and extension systems in Ecuador. Describes the present situation, identifies the limiting factors, and makes recommendations to improve the type, quality, and quantity of services necessary for the rural and agricultural development and growth of Ecuador. The study is divided into two parts: (1) the first part provides the background information, the description and analysis of the agricultural and rural sector, and the description and analysis of the research, education and extension systems within the agricultural sector of Ecuador; and (2) the second part provides an analysis and recommendations for the research, education and extension systems within the country. Includes numerous tables with data relevant to each of the systems.

357. **Ferguson, A. E., Horn, N.** 1985. Situating agricultural research: Class and gender issues in project advisement. In R. S. Gallin and A. Spring (Eds.), *Women creating wealth: Transforming economic development* (pp. 85-90). Washington, D.C.: Association for Women in Development.

Agricultural research / Small farms / Women / Methodology / Botswana / Cameroon

This paper draws on materials from the Bean/Cowpea Collaborative Research Support Program. It demonstrates how information on class and gender issues in agriculture permits plant pathologists, geneticists, entomologists, and others to design research that meets the needs of small farmers and women in developing countries. This approach also allows collaborating social scientists to pursue topics of concern in their own disciplines. A review of the social science literature on Botswana and Cameroon permits the identification of areas in which additional research would

contribute to academic debates as well as to project advisement. Presents the specific WID recommendations that grow out of this analysis.

358. **Gamble, W. K.** 1983. Improving the global system of support for national agricultural research in developing countries. In B. Nestel (Ed.), *Agricultural research for development: Potentials and challenges in Asia* (pp. 12-18). The Hague, Netherlands: International Service for National Agricultural Research.

National research programs / Linkages / Developing countries

Discusses the possible reforms in modes of support for national agricultural research systems in their search for more viable products. The reforms proposed seek to exploit lessons learned from the CGIAR experience and to match these lessons with the needs of developing countries and of donors. The paper primarily addresses problems of fund raising but also recognizes that a system of support is but one of many important factors that influence the performance of a research institution.

359. **Garrett, P.** 1983. Farming-systems research: An introduction to the literature. *Rural Sociologist*, 3, 229-232.

Farming systems / Bibliographies

Critically delineates the major literature in the area of farming systems research for rural sociologists. Further reading is worthwhile only if one has serious interest in a specific region or institution. The literature rapidly becomes repetitive and boring. Furthermore, it is not engaging either theoretically or methodologically.

360. **Gomez, A. A., Gomez, K. A.** 1983. Multiple cropping in the humid tropics of Asia. Ottawa: International Development Research Centre. 248 p. (IDRC - 176e).

Farming systems / Multiple cropping /

Methodology / Bibliographies/ Technical progress / Rice / Maize / Asia / Philippines

Examines the great potential of multiple cropping for increasing farm productivity in the humid tropics and the unique requirements of multiple cropping technology. Summarizes current scientific work in multiple cropping, evaluates research and extension methodologies, identifies areas of research and development that maximize gains in farm productivity, and describes how adoption of multiple cropping techniques by Philippine farmers was accelerated. Includes an extensive bibliography.

361. **Hildebrand, P. E.** 1983. Farming systems approach to technology development and transfer. Logan, Utah: Water Management Synthesis II Project, International Irrigation Center, Utah State University. 68 p.

Technology development / Technology transfer / Farming systems / Methodology

Discusses the motivation required for small farmers, scientists and technicians to accept change. Moves on to interdisciplinary research and the methods used in farming systems research and extension. Explains the Sondeo, a modified reconnaissance survey technique developed by ICTA in Guatemala as a response to budget restrictions, time requirements, etc. to augment information in a region where agricultural technology generation and promotion is being initiated. Reviews R.D. Hart's work on a hierarchical, ecological systems conceptual framework and the constraints to system productivity. Illustrates the on-farm technology development process with a case study from Malawi. Applies the farming systems approach to irrigation systems research.

362. **Hildebrand, P. E., Poey, F.** 1985. On-farm agronomic trials in farming systems research and extension. Boulder, CO: Lynne Rienner Publishers. 162 p.

Technology development / Methodology / On-farm testing / Analysis

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The book was developed from a workshop on the design and analysis of on-farm trials in San Jose, Costa Rica, September 5-10, 1982. It presents the role and philosophy of on-farm research in farming systems research and extension (FSR/E) activities and describes a logical sequence for technology development. It explains the most used statistical procedures in simple, easy-to-follow steps, aimed towards technicians who are often isolated and would like to or must analyze their own data. Finally, it presents new ideas and methods for analyzing agronomic data obtained without the effect of usual experiment station controlled conditions.

363. **Horton, D. E.** 1984. Social scientists in agricultural research: Lessons from the Mantaro Valley Project, Peru. Ottawa: International Development Research Centre. 67 p. (IDRC-219e).

Farming systems / Social scientists / On-farm testing / Methodology / Potatoes / Peru

Presents a summary of the experiences and results of the International Potato Center (CIP) program of interdisciplinary farm-level research in the Mantaro Valley of highland Peru. On-farm research is now embraced by CIP's management and working scientists as an integral part of the institution's research and technology transfer system. A range of survey and experimental techniques for on-farm research were developed and are now routinely employed in CIP's programs. The major findings of the project may be grouped under two headings: empirical research results and methodological lessons. The six major empirical findings highlighted in the report are: (1) ecology and farm type influence the technological requirements of farmers; (2) small-scale farmers are open to change and new technologies; (3) farmers rarely adopt complete technological packages; (4) farmers' technologies are, in many cases, equal or superior to recommended practices; (5) technical knowledge is available to solve many farmers' problems; and (6) technology cannot be "transferred," but must be adapted to local

conditions. The methodological lessons learned from the Mantaro Valley Project include: (1) interdisciplinary on-farm research requires flexibility and adequate resources; (2) on-farm research has far-reaching benefits; (3) informal surveys and simple on-farm trials have many advantages; (4) anthropologists and sociologists can play useful roles in agricultural research; and (5) many results can be extrapolated.

364. **International Crops Research Institute for the Semi-Arid Tropics.** 1983. ICRISAT farming systems research: A special report. Patancheru, Andhra Pradesh, India: ICRISAT. 68 p.
Farming systems / Agricultural research / Technology development / On-farm testing

Presents the reports of the working groups and the working paper addressed during the special in-house review of ICRISAT's Farming Systems Research Program (FSRP). Includes the reports of the six working groups: (1) Farming systems research at ICRISAT -- the needs, objectives, and strategy; (2) Center based research, structure, and integration of farming systems research technology; (3) Need for research at benchmarks; (4) Collaborative research with national research centers; (5) On-farm research; and (6) Integration of scientific research activity.

365. **International Rice Research Institute.** 1983. Women in rice farming. In B. Nestel (Ed.), Agricultural research for development: Potentials and challenges in Asia (pp. 34-36). The Hague, Netherlands: International Service for National Agricultural Research.

Women / Rice / Technology transfer / Technology development

Addresses the following questions: (1) What is the state of technology development for women-specific occupations so that productivity and income can be improved and drudgery minimized? (2) What is the impact of new technology on women's employment -- does the new technology lead to displacement of labor or diversification of labor use? (3) How can technology transfer programs ensure that

improved technologies become available to women? (4) What is the role of women in developing and operating technology generation and delivery systems? (5) Can technologies be devised which can help to diversify income opportunities for women?

366. International Service for National Agricultural Research. 1982. A review of the agricultural research system of Malawi. The Hague: International Service on National Agricultural Research. 88 p. (ISNAR R8).

Agricultural research / Institutions / Linkages / Malawi

Presents the results of a review of the agriculture research system in Malawi conducted by a team from the International Service for National Agricultural Research. With the primary purpose of the research system to provide a flow of improved technology to the various groups of producers of agricultural products, the report presents several recommendations from the review team which would be expected to make the research system more capable and more efficient in fulfilling this function. The report gives an overview of agriculture in Malawi separating out performance of the estate sector from the smallholder sector. The next section outlines the present research system including that within the Ministry of Agriculture, higher education, and commodity associations. It presents a summary of policy and price research, human resources, and linkages with policy makers, extension, educational institutions, and external institutions. The third major section discusses ways in which the research system may be improved touching on the topics of developing indigenous capability, investing in technology, operating budgets, management, manpower development, and linkages with international centers, client groups, extension, and other researchers. The final section outlines some short term actions that may be taken by the Ministry of Agriculture to improve the present system.

367. Johnson, J. S. (Comp.). 1985. Annotated bibliography on development and transfer of agricultural technology. Volume 1. Urbana,

IL: International Program for Agricultural Knowledge Systems, Office of International Agriculture, University of Illinois at Urbana-Champaign. 97 p.

Technology development / Technology transfer / Utilization / Bibliographies / Developing countries

Lists citations from the past ten years that are concerned with technology development, transfer, and utilization in agriculture and the links between the various groups that deal with these functions. The bibliography is divided into five major categories: (1) agricultural development - general; (2) policy and planning; (3) technology development; (4) technology transfer; and (5) technology utilization. Author, title, and subject indexes enable the researcher to locate specific items that cross the categorical boundaries.

368. Jones, William, Egli, Roberts. 1984. Farming systems in Africa: The Great Lakes Highlands of Zaire, Rwanda, and Burundi. Washington, D.C.: The World Bank. xi, 107 p.: ill., maps. (World Bank technical paper number 27).

Farming systems / Technology systems / Farms / Soil conservation / Crops / Livestock / Africa / Zaire / Rwanda / Burundi

This study uses 11 models to describe farming systems in three African countries. Evolution of farming systems and adaptation to changing conditions are analyzed. Reviews and assesses a large number of farm-level system changes. Focuses on soil conservation, cultivation practices for existing crops, changes in cropping patterns, and changes in livestock systems. Advances recommendations on soil conservation and enrichment measures and suggests possible diversification in export crops.

369. Kirkby, R. A. (Ed.). 1984. Crop improvement in Eastern and Southern Africa: Research objectives and on-farm testing. A regional workshop held in Nairobi, Kenya, 20-22 July 1983. Ottawa: International

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Development Research Centre. 122 p. (IDRC-218e).

Crop production / Farming systems / On-farm testing / Methodology / Agricultural research / East Africa / West Africa

The workshop focused on the need for crop improvement programs to assure that breeding objectives, screening techniques, and performance evaluation take into account farmers' objectives. Several papers in the proceedings address the need to include on-farm evaluation of genetic material in crop commodity research. As well, close collaboration between farming systems research groups is needed in setting priorities and breeding objectives and in developing on-farm evaluation techniques. The summary of discussions lists specific means to achieve these ends, and provides a very practical and useful guideline for many commodity and farming systems researchers.

370. **Krishnamoorthy, Ch.** 1982. Assumptions and approach of the All-India Project for Dryland Agriculture. In R. S. Anderson, P. R. Brass, E. Levy, and B. M. Morrison (Eds.), *Science, politics, and the agricultural revolution in Asia* (pp. 189-220). Boulder, CO: Published by Westview Press for the American Association for the Advancement of Science. (AAAS selected symposium 70).

Agricultural research / India

Demonstrates the great value of a locally responsive research program to the cultivators in a distinct regional agrarian system. Describes the activities and accomplishments of the All-India Coordinated Research Project for Dryland Agriculture which was started in 1970 to improve and to stabilize the productivity of crops in dryland areas.

371. **Lipton, M.** 1985. The place of agricultural research in the development of sub-Saharan Africa. Brighton, England: Institute of Development Studies, University of Sussex. 51 p. (Discussion paper DP 202).

Agricultural research / Agricultural policy / Africa

Outside sub-Saharan Africa (SSA), agricultural research (AR) yields excellent returns. Why does SSA get so little from its major AR effort? Why do its AR scientists cost more, yet produce less? Smallness (of countries and research stations), dispersion, and high turnover make it hard to attain a "critical mass" of national AR scientists. To remedy this, they concentrate on a few problems and crops but have neglected many of the most important, e.g. cassava, and overstressed export crops. In other ways, too, European biases have entered research design too little and too late. Most important, AR needs direction from clearer agricultural policy based on radically improved information, and recognizing SSA's dramatic rise in labor/land ratios. Guidelines for such policy are indicated; within these, a formalized and poverty oriented AR design system is suggested.

372. **Madamba, J. C., Swaminathan, M. S.** 1983. Cooperation between national research systems and the international research support community. In B. Nestel (Ed.), *Agricultural research for development: Potentials and challenges in Asia* (pp. 4-11). The Hague, Netherlands: International Service for National Agricultural Research.

Agricultural research / International agricultural research centers / National research programs / Linkages / Developing countries

Presents an overview of the evolution and development of the national agricultural research systems, the international agricultural research centers, and international associations, as well as the contributions of donor countries and agencies to the continued development of agricultural research in developing countries. Focuses on the need to bring about more productive working relationships among these various sectors.

373. **Martinez, J. C., Arauz, J. R.** 1984. Developing appropriate technologies through on-farm research: The lessons from Caisan, Panama. *Agricultural Administration*, 17,

93-114.

Cost analysis / On-farm testing / Methodology / Linkages / Innovation adoption / Technology development / Panama

Describes the methodological aspects and results of an area-specific on-farm research (OFR) program implemented (1978-1983) in the area of Caisan, Panama under the leadership of the Instituto de Investigaciones Agropecuarias de Panama (IDIAP) with technical support from CIMMYT. Gives special emphasis to the links between the assessment of farmer circumstances and the identification of promising research opportunities, as well as to the integration of survey and experimental results at the end of each crop cycle, leading to recommendations for farmers, for policy makers and for future on-farm and station research. Briefly assesses farmers' adoption of the technologies generated and the cost efficiency of the OFR methods involved. Describes the contribution of the Caisan experiences for the development of national OFR operations within IDIAP.

374. **Matlon, P. ...[et al.]**. 1984. Coming full circle: Farmers' participation in the development of technology. Ottawa: International Development Research Centre. 176 p. (IDRC - 189e).

Farming systems / On-farm testing / Communication / Technology development / Information flow / West Africa / Social participation

Involving farmers in identifying the constraints to rural agriculture and in designing measures to alleviate them is the subject of this publication, which resulted from a meeting held in Ouagadougou, Upper Volta, 20-25 September 1983. Agronomists, economists, anthropologists, and other seeking to get the most from research efforts discussed the pitfalls of assembling packages that are sound technically but have some essential flaw because the developers have overlooked some crucial constraint at the farm level. The subject is one that is receiving much attention

currently as agriculture in developing countries has failed to net major increases in production despite thousands of dollars invested in research and optimistic claims that improved varieties, techniques, equipment, etc. have been developed. The gaps between results on research stations and those on farms in the Third World have prompted some researchers to view the farmers' conditions as the real laboratories. Why, how, where, and when to get farmers involved in research are the focus of this document, and the degree to which researchers and the agencies they represent have been able to listen and work with their new partners varies as is clear from the 11 papers and the commentary that follows them.

375. **Maxwell, S.** 1984. Farming systems research: Hitting a moving target. The social scientist in farming systems research. 49 p. (Discussion paper DP 199).

Farming systems / Systems analysis / Social scientists / Agricultural research

Paper I argues that although targeting is a key element in farming systems research, neither the concepts nor the procedures take sufficient account of the fact that farming systems are in constant flux: the "target" is not static, but continuously on the move. A framework is presented for the analysis of change and the practical implications for farming systems research are analyzed. The involvement of social scientists in agricultural research institutions has contributed to the improvement of research methods but has often been associated with conflict. Paper II describes the development of such conflict in one composite situation and analyses five explanations: personal inadequacy; interdisciplinary communication barriers; poor group dynamics; inadequate institutional structure; and power struggle. It concludes that structural problems and disputes over power are more important than is usually recognised, and makes some suggestions as to the practical lessons of the analysis for social scientists, for the colleagues of social scientists and for higher level policy-makers.

376. **Maxwell, S.** 1984. The role of case studies in farming systems research. Health, nutrition and agriculture: Linkages in farming systems research. 64 p. (Discussion paper DP 198).

Farming systems / Case studies / Methodology / Bolivia / Linkages / Health / Nutrition

Paper I discusses the case study method as a useful and cost-effective addition to the range of research tools used in multidisciplinary farming systems research. The case study method provides information that would be hard to obtain by other means, as well as an opportunity for close collaboration between social scientists, natural scientists and farmers. Practical problems include selection and representativeness; data and data collection; analysis and reporting; and follow-up. These are discussed. The argument is illustrated with an example from Santa Cruz, Bolivia. Paper II argues for the interdependence of health, nutrition and agriculture, and the implications this has for the content and method of farming systems research. The paper proposes a conceptual framework for analyzing the linkages, and explores the implications for farming systems research in terms of data and procedure. A case study is presented, based on farming systems research in Santa Cruz, Bolivia. It is concluded that this is potentially a very productive area in which further research is needed.

377. **McDermott, J. K.** 1984. The technology of technological innovation. Unpublished manuscript. 36 p.

Technology development / Technical progress / Models / Developing countries

Attempts to set forth a model of the technological innovation process and apply that model to the task of designing an organization to facilitate the process in agriculture. The model is established under the premise that the relevance of technology is greatly influenced by ecology, location, economics, and availability of goods and services. Stresses the significance of site specificity of agricultural technology for the organization, management,

and methodology of efforts to induce innovation.

378. **Mehta, N. N.** 1983. Developing technical recommendations and research-extension linkages: Experience in India. In M. M. Cernea, J. F. A. Russell & J. K. Coulter (Eds.), Agricultural extension by training and visit: The Asian experience (pp. 35-48). Washington, D.C.: World Bank.

Technology development / Extension / T & V system / Linkages / India

Describes the implementation of the T & V extension system in Madhya Pradesh, India and how the extension helps overcome constraints of production. Discusses setting priorities for extension programs and the role of the T & V system in identifying farmers problems and bringing research and extension close to each other.

379. **Miranda, S. M.** 1983. Land. In B. Nestel (Ed.), Agricultural research for development: Potentials and challenges in Asia (pp. 19-27). The Hague, Netherlands: International Service for National Agricultural Research.

Farming Systems / Soil classification / Developing countries / Soil surveys

Discusses the need for a soil classification system that serves as a guide for making and interpreting a soil inventory and the soil inventory itself in order to relate research to specific localities.

380. **Monu, Erasmus D.** 1983. The diffusion of innovation model in action: The Funtua Agricultural Development Project, Kaduna State, Nigeria. Agricultural Administration, 13, 201-217.

Agricultural development / Innovation adoption / Farmers / Technology development / Nigeria

Examines the implementation of the progressive farmer strategy in the agricultural development project in Nigeria. Project

started in 1975 with the assistance of the World Bank. Its objective is to improve the general standard of living in the area by increasing agricultural production and farm incomes. Concentrates mainly on large-scale and progressive farmers and the majority of the farmers have been ignored. Does not support clearly the assumption of the progressive-farmer strategy that innovations trickle down from progressive farmers to non progressive farmers. The concentration on progressive farmers to develop them into large-scale farmers could lead to a lopsided development which could force small farmers to leave the land.

381. **Morita-Lou, Hiroko. (Ed.).** 1985. Science and technology indicators for development. Proceedings of the panel of specialists of the United Nations Advisory Committee on Science and Technology for Development held at Graz, Austria, 2-7, May 1984. Boulder: Westview Press. 207 p. (United Nations Science and Technology for Development Series).

Technology development / Methodology / Indicators / Case Studies / Brazil / Developing countries / China

Presents the papers of the panel of the Advisory Committee held at Graz, Austria. Deals with the current indicators used to measure the impact of science and technology in developing countries. Contends that these indicators often lead to inaccurate conclusions. Examines the potential for and the constraints on the existing approaches and difficulties for applying new methodologies. Discusses the strengths and limitations of currently available indicators and outlines the necessary preconditions for their use. Includes case studies of current programs in Brazil and China.

382. **Moseman, A. H.** 1977. Coordinating national research projects for improving food crop production. In T. M. Arndt, D. G. Dalrymple and V. W. Ruttan (Eds.). Resource allocation and productivity in national and

international agricultural research (pp. 367-380). Minneapolis, MN: University of Minnesota Press.

Agricultural research / Developing countries

Begins with a brief overview of agricultural research systems in the U.S. and Japan. Then moves on to a survey of coordinated national research projects in developing nations. Concludes with a section on strengthening coordinated national research projects in developing nations.

383. **Nepal. Department of Agriculture. Integrated Cereals Project.** 1984. Through farmers' eyes. Kathmandu, Nepal: Integrated Cereals Project, Dept. of Agriculture. 29 p.

Farming systems / Innovation adoption / Technology development / On-farm testing / Nepal

Presents results from Nepal's cropping systems research program that is raising the productivity of some of the world's smallest landholdings. Describes the methodology used to instigate the successful cropping systems program. Surveys are one tool used in the continuing socioeconomic analysis for cropping systems research. Cropping patterns are studied in order to understand farmers' existing practices. Researchers investigate ways to intensify cropping patterns by growing a crop when land is ordinarily fallow or by introducing alternative crops. The research is carried out by farmer cooperators working in close conjunction with the project staff. Discusses some of the complexities of this type of program including linkages with research stations, verification trials, production campaigns, and adoption of new ideas.

384. **Nestel, B. (Ed.).** 1983. Agricultural research for development: Potentials and challenges in Asia. The Hague, Netherlands: International Service for National Agricultural Research. 60 p.

Research / Developing countries / Technology development

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Presents the report of the conference entitled "Agricultural Research for Development - Potentials and Challenges in Asia" held in Jakarta, Indonesia, October 24-29, 1982 sponsored by the Food and Agricultural Development Centre (ZEL) of the German Foundation for International Development (DFG) and organized by the International Federation of Agricultural Research Systems for Development (IFARD) Asian Region and the International Service for National Agricultural Research (ISNAR). Includes the papers presented at the conference and summaries of the discussions and conclusions sessions.

385. **Nickel, J. L.** 1985. Low input, environmentally-sensitive technologies for agriculture. New Brunswick, NJ: International Agricultural and Food Program, Cook College, Rutgers University. 20 p. (IAFP working paper series publication no. 7. A Grant E. Walton International Lecture).

Technology development / Small farms / Environmental factors

Presents the need for and examples of a research strategy aimed at producing technology which is less dependent on high levels of purchased inputs in order to produce technology which is equity-sensitive and environmentally friendly. Discusses the various types of research strategies for producing such technologies. Outlines several research methodologies used in this type of research such as the interdisciplinary team approach, decentralized crop improvement, and on-farm research. Gives some examples of progress in this type of research at CIAT with beans, cassava, rice, and pasture crops.

386. **Oram, P. A.** 1983. The nature and extent of the problem: An overview of research and extension needs. Paper presented at the Workshop on Financing the Recurrent Costs of Agricultural Services. 42 p. Mimeographed.

Agricultural research / Extension / Resource allocation / Cost analysis / Developing countries

Presents an overview of the problems, procedures and future potential for financing agricultural research and extension in developing countries. First of all, the author traces some of the changes in the needs of research and extension over time and illustrates these changes with factual evidence. The author then deals with recent trends and emerging problems such as the contributions of external support to agricultural research in developing countries, links between research and extension, imbalances in the distribution of research resources, and implications of the development of research and extension services for education and training. Concludes by highlighting some important issues for consideration.

387. **Pinstrup-Andersen, P., Berg, A., Forman, M. (Eds.)** 1984. International agricultural research and human nutrition. Washington, D.C.: International Food Policy Research Institute. 326 p.

Agricultural research / International agricultural research centers / Nutrition

Presents a comprehensive review of the nutrition-related activities undertaken by the international agricultural research centers (IARCs) supported by or associated with the Consultative Group on International Agricultural Research (CGIAR). Suggestions are made for ways in which local, national, and international agricultural research institutions can incorporate goals of improving human nutrition into research design and planning. Because hunger and malnutrition are closely linked with poverty, the content of the book also provides a great deal of evidence of the way the work of the IARCs relates to the poor, whether farmers, workers, or consumers. The papers included in the book were presented and discussed at a workshop sponsored by the UN Administrative Committee on Co-ordination/Sub-Committee on Nutrition (ACC/SCN) and the participating IARCs. The purposes of the workshop were to discuss methods now being used by the IARCs for incorporating nutritional goals into agricultural research and to explore ways of further integrating nutrition concerns

into the planning and execution of agricultural research. The focus of the workshop was on current and prospective methods for strengthening the effect of agricultural research on nutrition rather than an assessment of its actual effect. The book presents a brief summary of workshop discussions and recommendations (Chapter 2), followed by an overview of the interactions between agricultural research and human nutrition (Chapter 3). Papers prepared by each of the participating centers on nutrition-related activities are given in Chapters 4-16. The syntheses of the papers, together with comments, are presented in Chapters 17-21.

388. **Poznanski, K.** 1985. The environment for technological change in centrally planned economies. Washington, D.C.: World Bank. 64 p. (World Bank staff working papers, no. 718).

Innovations / Centrally planned economies / Research / Resource allocation / Technology development / Research policy / Technical progress / Eastern Europe / USSR

This survey looks at the relationship between performance and the environment for technological change in centrally planned economies to draw some lessons about what is needed for successful development. Concentrates on the Soviet Union and the countries of Eastern Europe which have the most experience in trying to manage technological change under a centrally planned system. Finds that reforms limited to changes in the organization and administration of research—accompanied by minor improvements in such things as diffusion targets, bonus systems in enterprises, and procedures for technology imports—are not enough to bring about important improvements in technological performance. Suggests that a centrally planned economy can obtain modest improvements in its technological development by changing policies and institutions, but accelerating the pace of technological progress hinges on changing the fundamental principles governing the allocation and use of productive resources.

389. **Pray, C. E., Ruttan, V. W.** 1985. Completion report of the Asian Agricultural Research Project Contract no. AID/ASIA-C-1-456. Minneapolis, MN: Economic Development Center, University of Minnesota. Various pagings. (Bulletin no. 85-2).

Agricultural research / Research policy / Resource allocation / Asia / India / Bangladesh / Pakistan / Thailand / Indonesia / Philippines

Summarizes the activities and research carried out on the 5-year Asian Agricultural Research Project led by the Agricultural and Applied Economics Department at the University of Minnesota with Yale University taking an important secondary role. The first section is an executive summary of the report and includes a short review of the framework and methodology used during the project. Country studies were conducted on India, Bangladesh, Pakistan, Thailand, Indonesia, and the Philippines. Chapters discuss the following topics: 1) impact of research on agricultural productivity; 2) impact of research investments on income distribution; 3) determinants of research expenditure; 4) development and change in Asian agricultural research institutions; and 5) the impact on the Agency for International Development. Includes a list of publications from the project.

390. **Reddy, A. A.** 1981. Essential linkages for effective transfer of agricultural technology: A systems approach. In Management of transfer of farm technology (pp. 69-84). Hyderabad, India: National Institute of Rural Development.

Technology transfer / Technology development / Linkages / Systems analysis

Discusses seven systems which constitute the transfer of technology, their functions and problems. These seven include research, extension, client, inputs, economic, psychosocio-cultural and administrative organizational systems, all of which are not discrete but overlapping.

391. **Rockefeller Foundation.** 1985. Women and agriculture technology: Relevance for

research. Report from the CGIAR Inter-Center Seminar on Women and Agricultural Technology, Bellagio, Italy, 25 to 29 March 1985. The Hague: International Service for National Agricultural Research. 2 v.

Agricultural development / Role of women / International agricultural research centers / Technology development / Asia / Africa / Latin America

This is a collection of papers from a conference held by the International Agricultural Research Centers (IARCs) to discuss how current activities of the centers relate to a more effective integration of women in the modernization of agriculture. Volume 1 contains overview papers discussing the technology user's perspective as a guide to research, the relationship between national and international research systems, the special characteristics of women as users of technology, and an overview of relevant IARC activities. The second volume contains background papers prepared by each IARC on its experience in incorporating the user's perspective into research, and regional reviews of women's role in agricultural production for Asia, Africa, and Latin America.

392. **Ruttan, V. W.** 1983. An induced innovation interpretation of technical change in agriculture in developed countries. In M. Pineiro & E. Trigo (Eds.), *Technical change and social conflict in agriculture: Latin American perspectives* (pp. 1-24). Boulder, CO: Westview Press.

Technical progress / Induced innovations / Economic policy / Agricultural policy

Examines the theory of induced innovation on technical change in agriculture. Discusses various approaches economists have taken toward induced innovation. Considerable information given about the plausibility testing of the induced technical change hypothesis using the history of agricultural development in the United States, Western Europe, and Japan. Separate tests, the Hayami-Ruttan type, the Binswanger Two-Factor tests, and the Binswanger Many-Factor test are discussed.

The Binswanger tests appeared to be consistent with the hypothesis. Implications of induced innovation on economic policy, agricultural policy, research planning, and resource allocation are briefly examined.

393. **Sadikin, S. W.** 1983. Overcoming technology gaps. In B. Nestel (Ed.), *Agricultural research for development: Potentials and challenges in Asia* (pp. 28-33). The Hague, Netherlands: International Service for National Agricultural Research.

Technology development / Technology transfer / Linkages

Discusses the development of technology at the international and national agricultural research centers and the links necessary to channel the technology successfully to the farm. Concludes with some criticisms of agricultural research and emphasizes the need to respond to these criticisms if we are to maintain viable agricultural research systems.

394. **Sanders, J. H., Lynam, J. K.** 1982. Evaluation of new technology on farms: Methodology and some results from two crop programmes at CIAT. *Agricultural Systems*, 9, 97-112.

Technology development / On-farm testing / Evaluation / Adaptation / Linkages / Feedback / Colombia / Methodology / Technology transfer

Discusses the problem of transfer of new technology from the research station to the farm by examining two crop programs at CIAT (Centro Internacional de Agricultura Tropical). Hypothesis examined by the authors is that the reason the yield gap exists between the experiment stations and farm yields in the production of food crops in developing countries is that many successful technologies on the experiment station do not pass a set of reasonable farm level criteria. Notes that farm testing is the logical extension of the research evaluation process once a technology has been identified on the experiment station and regionally tested for adaptation. Emphasi-

zes that farm testing is an especially important component of the research process in developing countries because communication links between farmers and researchers are weak and farmers often do not have the information or management experience to combine and modify various technology components developed by the experiment station to their own environments and production systems. Authors note that the bottom line of new technology evaluation is the profitability and the fit into the farmers' systems of the new input combinations. Presents a methodology for farm testing as a component of the research process and the results of two farm trials in Colombia.

395. **Shaner, W. W.** 1984. Stratification: An approach to cost-effectiveness for farming systems research and development. *Agricultural systems*, 15, 101-123.

Technology development / Farming systems / Methodology / Cost analysis / Stratification

Farming systems research and development is a new approach aimed at meeting the needs of farmers with limited resources in the less developed countries. The cost-effectiveness of the approach rests with identifying enough farmers operating under similar conditions who will adopt the proposed technological improvements. An important way of doing so is through stratification of environmental and farmers' conditions to develop what is called a recommendation domain. This paper reports on current stratification efforts, involving: (1) descriptive schemes (classification of farming systems, agricultural growth stages, and an ecological systems approach); (2) stratification by components (agroclimatic zones, soil and land classifications, cropping and biological environments, farmers' cultural practices, and economic and socio-cultural conditions); and (3) stratification strategies used by four major research centers. The paper closes by asserting the need for further methodological work and offers some suggestions.

396. **Silveira, Mary Pat Williams.** 1985. Research and development: Linkages to

production in developing countries. Boulder: Westview Press. 316 p.: charts. (United Nations science and technology for development series).

Research / Technology development / Economic conditions / Linkages / Case studies / Productivity / Developing countries / Bolivia

While many developing countries rapidly expanded their scientific and technological capabilities, the current international economic crisis has severely threatened these programs. These economic difficulties stress the need to utilize effectively the scientific and technological resources available. Group of experts explore ways to organize research and development programs; create flexible and appropriate linkages to promote supplier-user interactions; and design policy mechanisms to promote and finance research and development. Outlines suggestions for pioneer projects in such areas as technological services delivery system for small industries; local technology system for rural areas; fund-syndicating technology delivery system for later enterprises and investors; linkages to improved productivity in under-utilized capacity; and identification of needs in the least-developed countries.

397. **Simmonds, N. W.** 1985. Farming systems research: A review. Washington, D.C.: The World Bank. 97 p. (World Bank technical paper n. 43).

Agricultural research / Farming systems / International agricultural research centers / Extension / Colombia / Panama / Nigeria / Ethiopia / India / Asia / Philippines / Indonesia

Farming systems research (FSR) has become increasingly important as an element of the research program of the international agricultural research centers, national research programs, and development projects with agricultural research components. Describes the state of the art of farming systems research, reviews the history of this approach and attempts to define its scope. Describes various on-farm research procedures, reviews

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the experiences in different international agriculture research centers, examines the contributions of different disciplines to FSR and the relation of FSR to agricultural extension. Draws attention to wider questions related to the needs of carrying out FSR further in various institutional settings of interest to agricultural researchers, economists and international organizations.

398. **The World Bank.** 1985. Agricultural research and extension: An evaluation of the World Bank experience. Washington, D.C.: The World Bank. 110 p.

Technology development / Extension /

Evaluation / Technology transfer / Developing countries / Brazil / India / Indonesia / Kenya / Mali / Morocco / Nigeria / Sudan / Thailand / Turkey

Reviews the World Bank's support for agricultural research and extension in 128 projects in ten countries over the period 1978-80. The ten member countries are Brazil, India, Indonesia, Kenya, Mali, Morocco, Nigeria, Sudan, Thailand, and Turkey. Examines the national organizations in research and extension and discusses how well the Bank's assistance has benefited the countries' overall efforts to building up their research and extension capabilities.

Technology Transfer

399. **Adjid, Dudung Abdul.** 1985. Bimas programme: Rice technology transfer in Indonesia. Rome: Food and Agriculture Organization of the United Nations. 47 p.

Technology transfer / Rice / Farmers / Extension / Indonesia

Describes the factors associated with the successful transfer of rice technology during the BIMAS programme in Indonesia from 1968 to 1982. Provides historical description and policy background of the BIMAS rice production programme. Presents the government's policies and strategies for implementing the BIMAS programme. The programme consists of: (1) agricultural extension to encourage farmers' participation; (2) new rice technology, and (3) resources and activities. Identifies positive and negative factors which have been affecting rice production in Indonesia.

400. **Anderson, M. B.** 1985. Technology transfer: Implications for women. In C. Overholt, M. B. Anderson, K. Cloud, and J. E. Austin (Eds.), Gender roles in development projects: A case book (pp. 57-78). West Hartford, CT: Kumarian Press.

Technology transfer / Women / Development projects

Examines the issues of technology transfer and provides a framework for understanding the relationships between technology transfer and women's involvement in development. Addresses specifically those issues which are most important in designing projects that are effective in engaging women in the development process and in assuring women's participation in project benefits to the greatest possible degree.

401. **Araji, A. A. (Ed.).** 1980. Research and extension productivity in agriculture. Moscow, Idaho: Department of Agricultural Economics and Applied Statistics, University of Idaho. 561 p.

Technical progress / Agricultural research / Evaluation / Extension

Proceedings of the Symposium on Research and extension Evaluation held in Moscow, Idaho, May 21-23, 1978. Part I presents a review of all available research and extension evaluation studies. Reviews the approaches and methodologies used in evaluating the impact of research and/or extension programs for various commodities. Part II explores the value of evaluation information in agricultural research and extension policy, the implication of technological change, the contribution of research and extension to productivity growth, and the income distributional consequences of technical changes. Part III discusses the studies of returns to investment in agricultural research and extension conducted by the Interim Research Evaluation Committee.

402. **Ban, A. W. van den.** 1981. Interpersonal communication and the diffusion of innovations. In B. R. Crouch and S. Chamala (Eds.), Extension education and rural development. Vol. 1: International experience in communication and innovation (pp. 293-307). Chichester, England: John Wiley.

Interpersonal relations / Communication / Diffusion of information / Extension

Discusses interpersonal communications and leadership in the farming community. Examines the process of interpersonal communication at three levels: (1) the individual level—characteristics of the opinion leaders; (2) the two-person level—who influences whom and which way? (3) the village level—how do villagers differ in interpersonal communication? Discusses the ways in which extension officers can make use of the findings of communication research.

403. **Belay, H. S.** 1975. A comparative analysis of agricultural extension systems. Journal of the Association for the Advancement of Agricultural Sciences in Africa, 2, Supplement, 316-320.

Extension / Organizations / Management / Africa / Ethiopia / Malagasy / Malawi / Somalia / Tanzania / Uganda / Zambia

Reports the summary and recommendations of a document published by the Economic Commission for Africa under E/CN.14/AGRIP/1-0.A. Makes a comparative analysis of agricultural extension organization and administration in Ethiopia, Malagasy, Malawi, Somalia, Tanzania, Uganda, and Zambia.

404. **Bengtsson, B.** 1984. Technology and its transfer to resource-poor farmers in third world countries. In International Agricultural Center, Seminar - Strategies for Agricultural Extension in the Third World (pp. 13-30). Wageningen, The Netherlands: International Agricultural Center.

Technology transfer / Technology development / Innovation adoption / Extension / Policy / Developing countries / Ethiopia / Trinidad and Tobago / Sweden

Discusses extension in terms of its relationship to agricultural research and adoption of technology by farmers. Presents some of the features of past and present agricultural research and extension systems. Reviews three case studies of comparative analysis of agricultural research and extension at the micro level in Ethiopia, Sweden, and Trinidad and Tobago. Concludes with some policy implications for agricultural research and extension.

405. **Blackie, M. J., Dent, J. B. (Eds.).** 1979. Information systems for agriculture. London: Applied Science. 176 p.

Information services

Concerned with the information needs of agriculture and the facilities that are available to satisfy these needs. Each chapter consists of an invited paper on a particular aspect of agricultural information systems, with emphasis on the farm level. The concepts and technology of information systems are established. Discusses information systems operating at commodity, regional and national levels.

406. **Blanckenburg, P. von.** 1984. Agricultural extension systems in some African and

Asian countries: An analysis of country reports. Rome: Food and Agriculture Organization of the United States. 75 p. (FAO economic and social development paper 46).

Extension / Management / Methodology / Farmers / Rural Development / Africa / Asia

Describes agricultural extension systems in African and Asian countries. Based on country reports prepared for various purposes. Describes the features of the agricultural extension and training systems. Themes of importance are: (1) extension organization; (2) relationship between the farmer and extension; (3) major extension concepts and programmes; (4) main activities of extension services; (5) extension methodology; and (6) review of major constraints on extension work. As conclusion, singles out recommendations related to extension organization, management of extension work and staff development.

407. **Blencowe, J. P., Engel, A. E., Potter, J. S.** 1981. A technique of involving farmers in planning extension programmes. In B. R. Crouch and S. Chamala (Eds.), Extension education and rural development. Vol. 2: Experience in strategies for planned change (pp. 65-77). Chichester, England: John Wiley.

Planning / Extension / Social participation / Methodology

Presents the assessment of a five-year pasture improvement program in South Australia to see what had caused the lack of impact. Lack of farmer involvement was identified as a possible cause. It was hypothesized that involvement of Glacier Valley farmers in the steps of problem census, farm work, farm survey, presentation of results and group discussion would lead to group commitment to a program of learning as opposed to the lack of commitment in the earlier pasture regeneration program that did not involve the group in the planning stage. Gradually the whole group of 14 farmers became involved in the learning program. It was seen by the group members as not only useful in solving farm

problems, but also as a means of reestablishing solidarity within the group.

408. **Brass, P. R.** 1982. Institutional transfer of technology: The land-grant model and the Agricultural University at Pantnagar. In R. S. Anderson, P. R. Brass, E. Levy, and B. M. Morrison (Eds.), *Science, politics, and the agricultural revolution in Asia* (pp. 103-163). Boulder, CO: Published by Westview Press for the American Association for the Advancement of Science. (AAAS selected symposium 70)

Technology transfer / Institution building / India / Agricultural colleges

Examines the structure of the Agricultural University at Pantnagar's educational and research activities, the university's seed farm and associated institutions, and the university's administration to arrive at an explanation for the crisis at Pantnagar in 1978 in which police killed several farm laborers on the campus. The paper considers to what extent the unfortunate consequences that have contributed to the crisis are necessarily associated with agricultural technology transfer pursued on such a grand scale, to what extent such consequences were foreseeable, and whether or not there are any reasonable alternative forms of achieving the desired goals.

409. **Bunnag, J.** 1981. Motivation in development communication: Is the "admass" analogy a useful one? In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 1: International experience in communication and innovation (pp. 253-261). Chichester, England: John Wiley.

Communication / Advertising / Diffusion of information

Makes use of the knowledge in both advertising and development communications to determine whether the understanding of one can be obtained through knowledge of the other. Advertisers conduct marketing and audience research to develop the best strategy to sell a commercial product. It is equally important to conduct situational analyses of

the potential audience in a developing situation. There are dissimilarities between what the commercial advertiser is trying to sell and what the development communicator is trying to introduce as innovations. The promotion of an innovation has merit if its national or economic significance is equated with relevance and feasibility as perceived by the individual adopter. Although this presents difficulties when communicating a new idea to a farmer in a developed monetary economy as opposed to the introduction of a consumer item by an advertiser, at least both advertiser and target audience operate within the same cultural setting and the farmer is not as passive or distant from the innovation and its source as is the peasant in the developing economy. In the latter case there is an enormous conceptual and technological gap between the peasant and the item the communicator is trying to introduce.

410. **Bunting, A. H.** 1985. Extension and technical change in agriculture. Paper presented at the AERDC Conference, 15th to 21st September, 1985, *Investing in Rural Extension: Strategies and Goals*, held at the Agricultural Extension and Rural Development Centre, University of Reading. Mimeographed. 11 p.

Extension / Technical progress / Information flow

Considers agricultural extension from two points of view: (1) its relation to other parts of the agricultural knowledge system; and (2) its relation to other factors which induce or oppose progressive change in agriculture and in rural areas. Discusses the role the extension plays in the complete process of agricultural technical change.

411. **Butler, C. B.** 1983. Farming systems research and the land grant system: Transferring assumptions elsewhere. *Rural Sociologist*, 3, 220-228.

Farming systems / Technology transfer / Developing countries

Considers the feasibility of using the US institutional approach to promote agricultural development in developing countries. Noting that farming systems research is concerned about understanding the whole farm in a comprehensive manner, the social and agricultural structures of the USA and developing countries are compared to establish any differences which would affect the implementation of this approach. Six comparisons are made: (1) U.S. farmers were politically active in obtaining a mandate for research, while limited-resource farmers in developing countries are marginal to political power; (2) U.S. farmers and researchers share common goals, while researchers in developing countries tend to be from urban and/or elite backgrounds and have little in common with the farmer; (3) many developing societies do not place an equivalent value on mental and manual energy as in the U.S.; (4) the U.S. farm economy was founded on a husband and wife team sharing management, labor and farm ownership in contrast to the present situation in developing countries; (5) development of U.S. agriculture was assisted by the ability of the nonagricultural sectors to absorb noncompetitive farmers; and (6) in the U.S. there has always been close cooperation between private and public sectors in developing and disseminating agricultural technology, while developing countries do not have mediating factors.

412. **Cernea, M. M., Coulter, J. K., Russell, J. F. A.** 1984. Strengthening extension for development: Some current issues. In *International Agricultural Centre, Seminar - Strategies for Agricultural Extension in the Third World* (pp. 31-46). Wageningen, The Netherlands: International Agricultural Centre. Extension / Technology development / Technology transfer / T & V system / Asia

This paper was presented at a "Strategies for Agricultural Extension in the Third World", held January 18-20, 1984, at the International Agricultural Centre, Wageningen, The Netherlands. Identifies and discusses issues and concerns in implementing the T & V Extension System. The paper is divided into four

sections. The first part, or overview, introduces the paper and stresses the need to thoroughly understand the existing extension system and to test changes on a pilot basis before implementing them throughout the system. The second part emphasizes the importance of technology generation and of maintaining a close link between researchers and extension workers. The critical role of the Subject Matter Specialist (SMS) and the use of the farming system approach are noted. The transfer process is emphasized in the third section, stressing that the improvement of "the agents practical understanding of the local farming practices and farming systems" is the most important need in many national extension systems. The need to train agents in these areas is discussed. Increasing reliance on the activities of contact farmers is also examined. The need for additional research on effectiveness of alternate extension approaches is noted. The final section deals with the evolution of the T & V extension system noting that between 10-15 years are required to put the system in place. Orientation of involved staff, good leadership, and improved supervision at all levels are identified as essential to implementing an effective T & V system. Monitoring and evaluation of the system is recommended and discussed.

413. **Chatterton, B., Chatterton, L.** 1982. Failures in technology transfer: Are farmers overlooked? *Food Policy*, 7, 141-151. Technology transfer / Communication / North Africa / Middle East

Reviews attempts in technology transfer and improving farming systems in the production of cereals and livestock in the Middle East and North Africa. Suggests that the lack of success lies in the communication between expert and farmer and that the role of the farmer is underestimated in the transfer process. Discusses the development and dissemination of the South Australian integrated cereal/livestock system. Relates how the demonstration of farming skills is ignored by policymakers.

414. **Chung, Y. - B., Dong, Y. - M.** 1984. A study of the agricultural extension experiences in the Republic of Korea. Rome: Food and Agricultural Organization of the United Nations. 73 p.

Case studies / Extension / Agricultural development / Farm management / Planning / Evaluation / Training / Rural development / Korea Republic

Case study covers a wide range of issue useful to agricultural extension. Includes special features of the extension organizational structure, personnel, budget and equipment. Deals with the major activities of the agricultural extension program including planning and evaluation, development and functions of farmer's clubs technical training for farmers and agricultural information service. These activities are performed within the context of carrying three major extension programs, namely: (1) agricultural technical improvement program; (2) farm management improvement program; and (3) rural society development program. Describes the relationship between Saemaul Undong, a rural development movement, and the agricultural extension program.

415. **Claar, J. B., Dahl, D. T., Watts, L. H.** 1984. The Cooperative Extension Service: An adaptable model for developing countries. Urbana, IL: Office of International Agriculture, University of Illinois at Urbana-Champaign. 27 p. (INTERPAKS series no. 1).

Extension / Methodology / Evaluation

A paper based on the work of the International Task Force of the Extension Committee on Organization and Policy, Extension Service, U.S. Department of Agriculture. Explains the U.S. extension system, with its unique national state local collaboration tied to a system of land-grant colleges, and explores what components of that system might be useful or suggestive in other countries, given suitable adaptation. Nine "essential components" of an effective extension system are given, and a checklist of 28 questions is supplied to aid evaluation and planning.

416. **Claar, J. B., Bentz, R. P.** 1984. Organizational design and extension administration. In B. E. Swanson (Ed.), *Agricultural extension: A reference manual* (pp. 161-183). 2nd ed. Rome: Food and Agriculture Organization of the United Nations.

Extension / Organizations / Management

Outlines the special features of extension's assignments, the functions to be performed, the conditions to be achieved, and the conceptual guidelines to be used in decision making. Describes the concepts of organizational design for extension programs and outlines structural considerations for the various types of extension programs. Gives several examples of the different types of structural organization with descriptive narrative for each. Discusses the types, quantity, and qualifications for professional and support staff within the extension program. Concludes with brief narratives on personnel management, utilizing volunteers, extension facilities and equipment, financial management, reporting accomplishments, and liaison with other organizations.

417. **Colle, R. D.** 1984. Who "moves" the farmer: Some issues in communication and extension. In M. Drosdoff (Ed.), *World food issues* (pp. 73-78), 2nd ed. Ithaca, NY: Center for the Analysis of World Food Issues, Program in International Agriculture, Cornell University.

Extension / Communication

Discusses two competing communication strategies. One is a descendent of traditional extension philosophy, which emerged in the United States and was developed in the first half of the twentieth century. The second is related to the emergence in recent years of the concepts of "integration" and "participation" in rural development. The paper describes and analyzes each of these strategies and the issues they pose.

418. **Crouch, B. R., Chamala, S.** 1981. Communications strategies for technological

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change in agriculture: Implications for rural society. In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 2: Experience in strategies for planned change (pp. 267-275). Chichester, England: John Wiley.

Communication / Extension

Reviews empirical studies from Australia to provide a holistic picture of communication strategies used by extension officers and the type of audience (farming community) using these services. Issues discussed are: (1) general communication strategies employed by extension officers for advisory and educational services to farmers; (2) percentage of the farming community making use of different extension services to improve their enterprises; (3) type and characteristics of farmers using these extension services; (4) effects of the existing pattern of agricultural advisory services usage on the total social system; and (5) some alternative strategies to integrate and involve the largest possible proportion of the farming community for achieving technological development and social balance.

419. **Crouch, B. R.** 1981. Planning with people: An integrated extension service in Papua New Guinea. In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 2: Experience in strategies for planned change (pp. 255-266). Chichester, England: John Wiley.

Extension / Planning / Papua New Guinea / Case studies / Social participation

A case study which briefly describes the steps taken in establishing an integrated national extension service in Papua New Guinea. The primary concern is ways in which people can become involved in planning an extension program which will ultimately involve or affect them.

420. **Cusack, D. F.** 1983. A process model of agroclimate technology transfer. In D. F. Cusack (ed.), *Agroclimate information for development: Reviving the Green Revolution*

(pp. 313-329). Boulder, CO: Westview Press.

Technology transfer / Models / Information flow / Agroclimatology / Management / Feedback / Linkages

Addresses the challenges of the information revolution with particular emphasis on utilizing agroclimate information for agricultural development: (1) how to sort out and organize the information already available; (2) how to identify and collect the right kinds of new information; (3) how to absorb, analyze, and interpret the information; and (4) how to put it to work for the benefit of humankind. Presents a model of a process approach by which agroclimate information may be transferred to benefit agricultural development.

421. **Dick, W.** 1984. The Tuki-system. In *International Agricultural Centre, Seminar - Strategies for Agricultural Extension in the Third World* (pp. 67-83). Wageningen, The Netherlands: International Agricultural Centre.

Extension / Nepal / Community development

Provides an overview of a village-level extension system in the eastern hills of Nepal. The studies are local farmers who work voluntarily on an incentive basis for the development of their community. To become a Tuki, a farmer must participate in some basic training programs. They apply what they have learned in training to their own farms and then provide motivation to fellow farmers in solving common problems. The program was developed as part of the Integrated Hill Development Project (IHDP).

422. **Economic Commission for Africa, Natural Resources and Transport Division, Science and Technology Section.** 1970. The acquisition and transfer of technology for production activities in African countries. *Agricultural Economics Bulletin for Africa*, no. 12, 35-42.

Technology transfer / Africa

Summarizes the main issues involved in the subject of the acquisition of technology for production in Africa. Focuses attention on the

areas of concern covered by the overall subject and identifies the different modes of acquisition which are of importance for each sub-sector of production in industry and agriculture.

423. **Englander, A. S.** 1982. The technology transfer frontier and agricultural development. New York: Federal Reserve Bank of New York. 56 p. (Federal Reserve Bank of New York research paper no. 8211).

Technology transfer / Agricultural development / Technology development / Adaptation

The transfer of technology from developed to less developed countries is often treated as an exogenous and costless by product of technological change. Provides theoretical and empirical evidence that the extent of technology transfer will be a choice variable, affected by the research policies of the country originating the technology and of the country wishing to import the technology. To determine whether the potential for increasing adaptability is of significant proportions, the trade off between the improvement of wheat technology by CIMMYT and foreign countries is estimated. Two major conclusions emerged from the analysis: (1) it is possible to increase the transferability of technology emerging from centers of agricultural research and (2) in order to maximize their benefits from new technology countries must perform local research to adapt the technology to their local needs.

424. **Evans, J. F., Dahl, D. T.** 1984. Organizing for extension communications. In B. E. Swanson (Ed.), *Agricultural extension: A reference manual* (pp. 156-160). 2nd ed. Rome: Food and Agriculture Organization of the United Nations.

Extension / Communication / Management

Presents a concise overview of an extension communications unit. Includes the functions of such a unit including planning, information generation, staff training, evaluation, and communication services; guidelines for the

organizational structure of a communication unit; and staffing for communications support.

425. **Evenson, R. E.** 1985. The economics of extension. Paper presented at the AERDC Conference, 15th to 21st September, 1985, Investing in Rural Extension: Strategies and Goals, held at the Agricultural Extension and Rural Development Centre, University of Reading. Mimeographed. 18 p.

Extension / Economic evaluation

Defines economic studies of extension as falling into three classes: (1) studies of the economic consequences or impact of extension; (2) studies of the efficiency with which extension resources are utilized; and (3) studies of determinants of investment in extension. Reviews the studies in the first and third classes and then discusses some of the implications of these studies for the second class of efficiency studies. Part I provides an overview of international data on spending for research and extension to provide perspective to the review of economic studies. Part II discusses the evidence from extension impacts on farm production and productivity, farm income, farm employment, farm size, and on the value of farm assets. Part III discusses studies of political and economic factors that influence spending on extension. These factors include international aid to extension programs as well as domestic factors. Lastly, Part IV provides a discussion of implications for efficient organization of extension programs.

426. **Feder, G., Slade, R. H.** 1983. Experiences with the monitoring and evaluation of training and visit extension in India. Washington, D. C.: World Bank. 34 p. (World Bank staff working papers, no. 595).

Extension / Monitoring / Evaluation / T & V system / India

Describes the experiences of implementing monitoring and evaluation systems in T & V extension projects in India. Covers operational problems relating both to administrative and methodological aspects and reviews partial

preliminary results from a detailed case study of extension operations and farmers' practices. In the course of this review, the authors demonstrate how the results can be presented in a manner which is useful for monitoring and evaluation purposes. Concludes with some suggested lessons from experience gained so far.

427. **Feder, G., Slade, R. H., Sundaram, A. K.** 1985. The training and visit extension system: An analysis of operations and effects. Washington, D.C.: World Bank. 36 p. (World Bank staff working papers no. 719).

Extension / T & V System / Evaluation / Monitoring / India / Farm size

Analyzes the supply of, or demand for, extension services, the presence or absence of farm size bias in visits, seasonal and other variations in the pattern of visits, the importance of the extension agent as a source of information, and crop yields in relation to agricultural advice. Principal conclusions are drawn from data provided by monitoring and evaluation reports issued by several states in India and a study undertaken by the World Bank in conjunction with the Haryana Agricultural University in Hissar, India.

428. **Feder, Gershon, Slade, Roger H., Sundaram, Anant K.** 1985. The training and visit extension system: An analysis of operations and effects. London: Overseas Development Institute. Agricultural Administration Unit. 20 p. (Agricultural Administration Network discussion paper 14).

Extension / T & V system / India

Analyzes several aspects of the operation of the T and V extension system and some of the resulting effects. The focus is on three main issues: the supply and demand for extension services, the relative importance of village-level workers as sources of information, and effect of extension on farm productivity. The author draws on aggregate and farm level data pertaining to T and V extension operations in India to evaluate T and V on these main

issue-areas. Provides important conclusions and indicates that future research should focus on comparisons and data from different socioeconomic and cultural environments.

429. **Fernandez, F.** 1981. Mechanisms of interinstitutional transfer of technology and information exchange. In N. R. Usherwood (Ed.), *Transferring technology for small-scale farming* (pp. 49-65). Madison, WI: American Society of Agronomy. (ASA special publication no. 41).

Technology transfer / Organizations / Linkages / Developing countries

Discusses technology transfer as a three step process in the international and national realms: (1) materials transfer; (2) design transfer; and (3) capacity transfer. Suggests that there are three links in the technology chain: (1) the centers of generation of technology with international transferability; (2) the national research organizations; and (3) the national extension education and promotion organizations in developing countries. Except for the last link, coupling extension organizations with farmers, the remaining transfers are essentially of an interinstitutional nature. Discusses nine mechanisms which move technology and information between links of the transfer chain. Examples include distribution of segregating genetic materials from a local point, research networking, training, conferences, regional technical assistance, documentation, etc. Concludes with a short discussion of the transfer from research to extension and education.

430. **Portmann, Louise.** 1984. The performance of extension services in Botswana. London: Overseas Development Institute. Agricultural Administration Unit. 23 p. (Agricultural Administration Network paper no. 20).

Extension / Efficiency / Botswana

This paper is a synthesis of the initial review undertaken by three rural extension cadres in Botswana - Agricultural Demonstra-

tors, Assistant Community Officers, and Family Welfare Educators. Determines factors which prevented a higher quality of extension services. Discusses the factors which reduce the effectiveness of extension workers as: inadequate numbers and continuity of personnel, inadequate pre-service training, inappropriate extension areas, inadequate field support, and inadequate communication and cooperation.

431. **Gibbons, M. J., Schroeder, R.** 1984. Agricultural extension. Washington, D.C.: Peace Corps, Information Collection Exchange. 309 p. (Manual M-18).
Extension

Written for and by Peace Corps volunteers working as agricultural extension agents. Describes in detail the extension agent's job including research and planning, providing agricultural support services, farmer training, organizing cooperative activities, and management.

432. **Goodell, G. E.,...[et al.].** 1982. Rice insect pest management technology and its transfer to small-scale farmers in the Philippines. In Report of an exploratory Workshop on the Role of Anthropologists and Other Social Scientists in Interdisciplinary Teams Developing Improved Food Production Technology (pp. 25-41). Los Banos, Laguna, Philippines: International Rice Research Institute.

Technology transfer / Adaptation / Pest control / Philippines / Case studies

Describes how the interdisciplinary team formed by the International Rice Research Institute (IRRI) in 1978 to test and improve IRRI's integrated insect pest management (IPM) technology for farmers tilling small irrigated plots in Southeast Asia developed the technology from an initial Western orientation to its present form. Shows how IPM was tested in two projects in Central Luzon, each comprising five villages— one project "top down", the other "bottom up". Also describes how IPM was introduced in a control area with no

attempt to organize farmers. Evaluates only the interdisciplinary research conducted in the "bottom-up" villages where the project enjoyed the most success.

433. **Gowdar, S., Ables, H. A., Hargrove, T. R.** 1983. Training needs of information services in agricultural research and educational organizations in Asia: A 9-country survey. Manila, Philippines: International Rice Research Institute. 10 p. (IRRI research paper series, no 98).

Information services / Training / Communication / Asia

This study determines the educational and training needs and communications priorities as perceived by administrators and information officers in Asian agricultural research and educational organizations. The most important short-term training needs were in technical writing, publication editing, audiovisual production, and information retrieval. Organizations surveyed usually allocated 1-3% of their budgets to information services. Most information units provided a range of technical services but few had in-house facilities for printing and typesetting. The most important problems in organizing and maintaining information services were lack of adequately trained support staff, finances, equipment, professional staff, and in-service training programs.

434. **Harding, T. J.** 1982. Farm management advice to peasant agriculture: The transfer of technology. *Journal of Agricultural Economics*, 33, 47-56.

Technology transfer / Farm management / Methodology / Small farms

Considers the role of farm management in ensuring compatibility of extension content with the motives and constraints of individual peasant farmers. Emphasizes the need for a modicum of farm management expertise in the communication of innovation from extension agent to farmer but questions the suitability of advanced farm management techniques for this

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purpose. It is argued that, if the potential contribution of farm management is to be realized, there is a need for an intermediate and appropriate farm management technology.

435. **Haverkort, B.** 1984. Inventory of problems and possible solutions or rural extension activities in third world countries. In International Agricultural Centre, Seminar - Strategies for Agricultural Extension in the Third World (pp. 173-244). Wageningen, The Netherlands: International Agricultural Centre.

Extension / Developing countries / T & V system / Technology development / Technology transfer

Reviews recent literature on rural development and rural extension. Describes the experiences of several development organizations and individuals and their view of the nature of the problems and possible solution. Includes four annexes: (1) charts of provisional models for linkages of national technology development and transfer systems; (2) organization, environment and objectives of rural development agencies; (3) the functional group approach; and (4) strength and weakness of the T and V system.

436. **Haverkort, B.** 1984. Six approaches to rural extension. In International Agriculture Centre, Seminar - Strategies for Agricultural Extension in the Third World (Annex). Wageningen, The Netherlands: International Agricultural Centre.

Extension / Methodology

Identifies six types of extension approaches, and describes the characteristics, advantages and disadvantages of each approach. It is obvious that there is no single best extension approach. Each approach should take into account the context and conditions in which extension should function. The paper is aimed at middle level and senior extension managers in both developing and developed countries.

437. **Hillman, J. S., Monke, E. A.** 1983. International transfer of agricultural technol-

ogy. In A. Maunder & K. Ohkawa (Eds.), Growth and equity in agricultural development, Proceedings eighteenth International Conference of Agricultural Economists (pp. 519-528). Aldershot, Hampshire, England: Gower for International Association of Agricultural Economists and Institute of Agricultural Economics.

Technology transfer / Technology development / Developing countries

Reviews the substantial literature on agricultural technology transfer, with a focus on the key economic and institutional constraints which account for the stagnation of agricultural technology in LDC's. The failure of local institutions to develop new technologies has forced a reliance on international sources of both the private and public type. Profit constraints and differences in resource scarcity provide fundamental economic barriers to the development of new technology by foreign private interests. Another difficulty arises because international centers depend primarily on developed countries for investment funds. Since the developed countries see little direct benefit from these investments, high rates of return from successful research do not guarantee increases in financial support. These circumstances imply that the future development of efficient new technologies is likely to require the investment of additional resources at the local level.

438. **Hon, P. F.** 1981. The joint farming operation in Taiwan: A new approach to effective co-operative food production. In B. R. Crouch and S. Chamala (Eds.), Extension education and rural development. Vol. 2: Experience in strategies for planned change (pp. 87-107). Chichester, England: John Wiley.

Cooperative farming / Taiwan / Technology transfer / Small farms

Examines the problems encountered by small farmers in increasing their farm production. Taiwan's joint farming operation program, along with methods and procedures followed in

this project, show how planned technological change reached the small farmer. The purpose of the joint farming operation is to arrange for a number of farm families living in the same village and with adjacent farms to do their farm work together. Results in the late 1960's were so encouraging that the program was extended in the 1970's. However, such groups cannot be organized everywhere in Taiwan since they depend on an existing infrastructure not yet universally available.

439. **Howell, J.** 1982. Managing agricultural extension: The T and V system in practice. London: Overseas Development Institute, Agricultural Administration Unit. 17 p. (Agricultural Administration Network discussion paper 8).

Extension / T & V system / Management / Nigeria / Malaysia / India

Addresses a range of criticisms to T & V system. The system : (1) is concerned with the productivity of extension staff rather than the productivity of farmers; (2) is inappropriate to the diversity of small-scale farming environments; (3) is based on contact farmers and farmer group; and (4) fails to take into account the cost. Despite its shortcomings, the T & V brings performance of the extension to the attention of most ministries of agriculture. Procedures of implementation require adaptation to different agricultural environments.

440. **Howell, John.** 1984. Conditions for the design and management of agricultural extension. London: Overseas Development Institute, Agricultural Administrative Unit. 13 p. (Agricultural Administration Network discussion paper 13).

Extension / T & V system / Management

Attempts to "look for areas of agreement on successful management" by focusing on the lessons learned from T and V. The author first describes issues unrelated to T and V, and then focuses on three relevant issues: functions of field-staff, selection of and

attention to farmers, and recurrent cost implications. Points out that controversies about the impact of T & V system will remain. States that these controversies are about extension per se: the appropriate role of the World Bank and the conditions of service of field staff. The author concludes by emphasizing the six basic conditions for successful extension management which underpin T and V.

441. **Howell, John.** 1983. Strategy and practice in the T and V system of agricultural extension. London: Overseas Development Institute, Agricultural Administration Unit. 19 p. (Agricultural Administration Network discussion paper 10).

Extension / T & V system / Management

Focuses on responses to earlier publication on T and V approach to extension. Responses are categorized according to philosophy underpinning T and V, organization and management of T and V, and functions of extension staff. Particular attention is paid to the role and selection of "contact farmers." Responses represent a good mix of insights into T and V from practitioners and academics alike. Concludes by stating that the T and V system has brought extension into prominence within the broad field of agricultural development decision-making, and describes the gap between T & V "adaptive" extension philosophy and the actual practice of fixed targets and standard recommendations.

442. **Jaiswal, N. K., Arya, H. P. S.** 1981. Transfer of farm technology in India. In Management of transfer of farm technology (pp. 13-48). Hyderabad, India: National Institute of Rural Development.

Technology transfer / Utilization / India / Planning

Begins with a conceptual framework of the component systems in the transfer of technology. Then discusses the status and progress of technology utilization and the supporting systems. Concludes with an analysis of India's

Sixth Five Year Plan's Strategy for transfer of farm technology.

443. **Jaiswal, N. K., Srivastava, K. B.** 1976. Transfer of farm technology to small farmers: A study of organizational problems in India. *Agricultural Administration*, 3, 249-262.

Technology transfer / Organizations / Small farms / India / Institutions

Argues that, to bring small farmers into the mainstream of agricultural development: (a) innovative steps are needed to create dynamic institutions together with (b) action to sustain enthusiasm and (c) the revitalization of existing community organizations. Small holders need to be psychologically and socially viable if economic progress is to be made.

444. **Jayaraman, T. K.** 1979. Evaluation of agricultural extension in the Mahi-Kadana Irrigation Project. *Indian Journal of Agricultural Economics*, 34(4), 40-48.

Extension / Irrigation / India

Examines the role of extension in irrigated agriculture in the Mahi-Kadana Irrigation Project, Gujarat and assesses the overall effects on production levels. Presents a descriptive account of extension activities in the area as well as the methodology and results of an empirical analysis. Results indicate (1) extension makes a positive contribution in agricultural production and irrigated agriculture, in particular; (2) the supporting role of credit is essential; and (3) an appropriate price incentives along with the above would also improve production.

445. **Jedlicka, A. D.** 1983. Technology transfer to subsistence farmers: Management process and behavioral techniques. In D. F. Cusack (ed.), *Agroclimate information for development: Reviving the Green Revolution* (pp. 330-336). Boulder, CO: Westview Press.

Technology transfer / Innovation adoption / Management / Organizations / Social participa-

tion / Extension / Small farms / Developing countries

Discusses the flexible, humanistic management systems necessary for a successful transfer and adoption of technology. Emphasizes the problems of motivating small farmers to interact rationally in the transfer process. Describes the managerial styles of transfer agencies and then expounds on the Organization Development (OD) technique designed to change the beliefs, attitudes, values, and structure of organizations so they can adapt to new challenges.

446. **Jiggins, J.** 1984. Strategies for agricultural extension in the third world. In *International Agricultural Centre, Seminar - Strategies for Agricultural Extension in the Third World* (pp. 263- 279). Wageningen, The Netherlands: International Agricultural Centre.

Agricultural production / Extension / Women / Policy / Developing countries

The paper deals briefly with three strategic issues: (1) women's contribution to agricultural production; (2) women's access to agricultural services; and (3) affirmative action experiments to reorient and make more effective agricultural extension policy and practice. The word "women" was deliberately omitted from the title by the author for, in such a juxtaposition, readers tend to assume that reaching rural women is, somehow, an additional and perhaps marginal extension activity and not central to the task of raising output and productivity or maintaining and enhancing agriculture related livelihoods. It is the burden of the paper, to the contrary, that rural women, as farmers, decision-makers, and operators, are among the core clientele.

447. **Jones, P. C., Abkin, M. H., Rossmiller, G. E., Kim, D. M.** 1978. The institution-building experience in Korea. In G. E. Rossmiller (Ed.), *Agricultural sector planning: A general system simulation approach* (pp. 359-375). East Lansing, MI: Agricultural Sector Analysis and Simulation Projects, Department of Agricultural

Economics, Michigan State University.

Technology transfer / Institution building / Human resources

Reports Michigan State University's institution-building experience in implementing the general institutional and training principles in Korea. Includes discussions on motivation towards adoption, institutional infrastructure, and manpower development.

448. **Jones, F. C., Rossmiller, G. E.** 1978. Institutionalization of investigative capacity. In G. E. Rossmiller (Ed.), *Agricultural sector planning: A general system simulation approach* (pp. 337-344). East Lansing, MI: Agricultural Sector Analysis and Simulation Projects, Department of Agricultural Economics, Michigan State University.

Technology transfer / Institution building / developing countries

Discusses the general requirements for successful transfer of the general system simulation approach to providing input to planning and policy decision making in agricultural sector development. Delineates some of the constraints to institutionalization typically found in developing countries.

449. **Jussawalla, M., Lamberton, D. M. (Eds.)** 1982. *Communication economics and development*. New York: Pergamon Press in cooperation with the East-West Center, Hawaii. 345 p. (Pergamon policy studies on international development).

Economic development / Communication

This volume contains the contributions to a workshop examining the economics of communication, held at the East-West Communication Institute in 1980. Representatives from economics, information science, communication studies and development studies were present. The goal of the workshop was to formulate a methodology for integrating communication variables into economic development models. Anticipated workshop outcomes included wide ranging effects on promoting understanding of

such transnational aspects of communication planning as the impact on international trade, on transfer of appropriate technology, and on measuring elasticities in international markets to promote investment in the development plans of less developed countries. The expertise present at the workshop focused on formulating market effects, and diffusion effects of communication technology as a variable in economic development, planning, and investment policies. The workshop was also designed to test existing hypotheses and assumptions of economic theory and bring about a better conceptualization and measurement of the communication sector as a macro input for development. A case study from Nepal is also included.

450. **Lamberton, D. M.** 1981. *Communication in development planning*. In R. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 1: *International experience in communication and innovation* (pp. 245-252). Chichester, England: John Wiley.

Communication / Information flow

Reviews theoretical and empirical works on economic development, and concludes that communication is regarded as a service facility rather than a major input to economic activity and social development. This fragmented view of communication can be rectified by the adoption of the information sector approach. Information (collection, transmission, processing, storage, retrieval, etc.) is a necessary input into every aspect of economic decision-making.

451. **Leagans, J. P.** 1963. *The communication process in rural development*. Ithaca, NY: New York State College of Agriculture, Cornell University. 20 p. (Cornell international agricultural development bulletin 1).

Communication / Extension / Rural development

The primary challenge to extension educators is to have ideas useful to an audience, to

make their meaning clear, to get the ideas accepted, and to motivate people to adopt and practice them. The task requires effective communication. This study identifies and describes basic elements in the communication process and relates them to the task of rural development. Reveals some key problems and critical factors of communication. Advances six key elements of communication: a skillful communicator sending a useful message through proper channels effectively treated to an appropriate audience that responds as desired. With these elements understood, extension workers can actively improve their communication skills.

452. **Levy, E.** 1982. The responsibility of the scientific and technological enterprise in technology transfers. In R. S. Anderson, P. R. Brass, E. Levy, and B. M. Morrison (Eds.), *Science, politics, and the agricultural revolution in Asia* (pp. 277-297). Boulder, CO: Published by Westview Press for the American Association for the Advancement of Science. (AAAS selected symposium 70).

Technology transfer / Agricultural research / Institutions / Politics

Attempts to analyze the reasons why a significant degree of responsibility is attributable to the scientific and technological enterprise. Argues that science and technology is not neutral but rather interwoven with socio-political institutions. Uses examples from the work at the International Rice Research Institute to show that all scientists and technologists have a responsibility to engage in on-going assessment of their research programs and how they interact with sociopolitical processes.

453. **Lock, G. V.** [1983?] *Extension methods and rural development*. Reading, England: University of Reading, Agricultural Extension and Rural Development Centre. 28 p.

Extension / Methodology / Rural development / Bibliographies

Includes materials from the special collection of the Agricultural Extension and Rural

Development Centre at the University of Reading. Divided into six major sections: (1) rural development; (2) extension, strategy and method; (3) community groups and organizations in extension; (4) community development; (5) participation; and (6) "conscientization". Includes short annotations for the citations and author and country indexes.

454. **Manetsch, T. J.** 1978. Education to build human capacity. In G.E. Rossmiller (Ed.), *Agricultural sector planning: A general system simulation approach* (pp. 345-358). East Lansing, MI: Agricultural Sector Analysis and Simulation Projects, Department of Agricultural Economics, Michigan State University.

Technology transfer / Institution building / Human resources

Expands on the manpower requirements for institutionalization of the general system simulation approach to agricultural sector development. Describes educational programs designed to relieve constraints of human capacity.

455. **McKillop, B.** 1981. Role of the change agent in Papua New Guinea. In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 2: *Experience in strategies for planned change* (pp. 123-129). Chichester, England: John Wiley.

Extension / Social change / Interpersonal relations

Reports on evaluations of the roles of change agents in Papua New Guinea, the confusion that exists in their minds concerning roles and the interpersonal conflicts which can arise in organizations. It was found that the most highly skilled extension agents experience the highest levels of dissatisfaction and frustration from role conflict. Discusses three possible approaches to overcoming this: (1) the goals of rural development could be changed to fit the organization; (2) the organization could be changed to fit the goals; or (3) rural development could be encouraged outside the framework of the present extension service.

456. **Moran, M. J.** 1978. Transfer of post-harvest technologies to small farmers. *Desarrollo Rural en las Americas*, 10, 143-152.

Postharvest systems / Technology transfer / Small farms

This paper is concerned with the transfer of post-harvest technologies to small farmers as part of the total rural development effort. Post-harvest system needs to be tailored to the needs of the people it serves. Professional development technicians and politicians are now paying increased attention to small farmer problems, characterized as having limited access to productive services, technical assistance, income and political influence. The job of improving the welfare of small farmers through the transfer of technologies to reduce post-harvest losses is difficult; the small farmer is not usually a likely candidate to adopt innovations, assuming they are available and appropriate, since he cannot afford the inherent risk. Recent studies also suggest that low adoption rates are the result of the new technologies being appropriate for small farm situations, and hence an alternative approach—that of adjusting production and distribution technology to the social and economic system of a given rural area—is gaining some acceptance. The problem of increasing income and food production, and improving nutritional levels on small farms, must be approached from a base of existing farm systems, in terms of applying appropriate, practical post-harvest technological innovations. In addition, an improved agricultural extension or technical assistance system is considered essential for transferring the appropriate post-harvest technologies to small farmers. Several steps are suggested as a means to solving this problem, and a possible plan of action is outlined.

457. **Nagel, Uwe Jens...[et al.].** 1985. The modified training and visit system in the Philippines: A study on the extension delivery system in region III. Berlin: Fachbereich Internationale Agrarentwicklung, Technische Universität Berlin. xvii, 214 p.: map. (Reihe

Studien no iv/43).

Extension / T & V system / Philippines

Presents the results of a three months' survey carried out by the Technical University of Berlin for the Ministry of Agriculture, Region III, Philippines. Analyzes the impact of T and V approach upon the extension system. Describes the socio-economic setting of agricultural extension in Region III. Discusses the particulars of the Extension Delivery System (EDS). Looks at EDS from the extension as well as from the client side and present the respective findings. The main themes center around planning and management of extension as well as around the training and visit aspects of EDS. Analyzes the performance of extension at the village level. Solutions offered under EDS are scrutinized. Presents recommendations regarding: benefits of the unified extension service; the concentration on advisory functions; extension training; systematic visits to contact leaders; and contents and sources of extension messages.

458. **Nelson, R.** 1974. Less developed countries - Technology transfer and adaptation: The role of the indigenous science community. *Economic Development and Cultural Change*, 23, 61-77.

Technology transfer / Adaptation / Research / Developing countries

Tries to develop a perspective on the role of the scientific community in development. Section I reviews the nature of the economic development problem as viewed by development economists. Section II discusses the differences in view points of development of the economist and the natural scientist. Section III focuses on the role of the science community in developing countries.

459. **Nikahetiya, S. B. R.,...[et al.].** 1977. The effectiveness of agricultural extension methodology. Colombo, Sri Lanka: Agrarian Research and Training Institute. 33 p.

(Research study series no. 24).

Extension / Methodology / Sri Lanka

Discusses seven different types of extension methods used in Sri Lanka: (1) inter-personal contact; (2) demonstrations; (3) field days; (4) farmer training classes; (5) "minikits" and "production kits"; (6) journals and advisory leaflets; and (7) radio programs. Evaluates the effectiveness of these methods in bringing about desirable changes in farmers.

460. **Nix, H.** 1980. Agroclimatic analogues in transfer of technology. In V. Kumble (Ed.), Proceedings of the International Symposium on Development and Transfer of Technology for Rainfed Agriculture and the SAT Farmer, 28 August - 1 September 1979 (pp. 83-88). Patancheru, Andhra Pradesh, India: International Crops Research Institute for the Semi-Arid Tropics.

Technology transfer / Agroclimatology

Reviews and discusses basic concepts and methods of agroclimatic classification and homocline analysis. Examines reasons for the tardy progress in development, testing, and application of methods of agroclimatic analysis and identifies possible alternative approaches. These include concepts of minimum data sets, definition of optimum experimental networks, and development of dynamic interactive systems of crop-climate and crop-weather analysis and synthesis.

461. **Overseas Development Institute, Agricultural Administration Unit.** 1977. Extension, planning, and the poor. London: Overseas Development Institute, 57 p. (Agricultural Administration Unit occasional paper 2).

Extension / Rural development / Planning / Social participation

A collection of three papers concerned with small farmers and the poor. Includes Motivation and Performance of Extension Field Staff by Janice Jiggins; Notes on Poverty Oriented Rural Development by Paul Devitt; and Planning and the Small Farmer by Guy Hunter.

462. **Patel, A. U., Ekpere, J. A.** 1978. Characteristics and radio listening behaviour of farmers and impact on knowledge of agricultural innovations. Agricultural Administration, 5, 83-90.

Radio / Mass communication / Information flow / Diffusion of information / Nigeria

Attempts to identify the critical determinants of Nigerian farmers' radio-listening behavior and the impact of radio programs on farmers' knowledge of agricultural innovations. Data for the study were collected from one hundred randomly selected farmers, forty-nine of whom owned radios and fifty-one of whom did not. The farmers were interviewed using a pre-tested structured questionnaire. The results showed that: (1) most farmers listen to radio programs such as news, traditional poetry, entertainment and special farm features; (2) prime listening time is between 6 p.m. and 9 p.m. daily; (3) family size, farm size and age have no significant relationship with radio listening even though those who are literate and owned radios listened for longer hours; and (4) radio listenership significantly increased knowledge of improved farm practices.

463. **Perraton, H.** 1983. Mass media, basic education and agricultural extension. In Basic education and agricultural extension: Costs, effects, and alternatives (pp. 59-145). Washington, D.C.: World Bank. (World Bank staff working papers no. 564).

Extension / Bibliographies / Education / Mass media / Developing countries

Surveys the evidence on using mass media to provide basic or agricultural education and to support agricultural extension in third world countries. A systematic search through the literature makes it possible to draw some conclusions about the methods, effects and costs of such use of mass media. Begins by analyzing the aims of agricultural extension and basic education. Then examines the constraints within which basic education and agricultural extension work and which apply regardless of the methods of communication

used. The main body of the paper discusses the use that has been made of mass media and the costs of mass media. The final section discusses the implications of the findings for policy and for research.

464. **Pickering, D. C.** 1983. Agricultural extension: A tool for rural development. In M. M. Cernea, J. K. Coulter, and J. F. A. Russell (Eds.), *Agricultural extension by training and visit: The Asian experience* (pp.3-13). Washington, D.C.: World Bank.

Extension / Rural development / T & V System / Asia

Presents an overview of the subjects of discussion at the Asian Regional Workshop on the Training and Visit System of Extension held in Chiang Mai, Thailand, in November-December 1982. Points out the importance and shortcomings of traditional extension systems. Outlines the Training and Visit (T & V) System of extension and the growth of the use of this particular system in several countries around the world. Discusses the advantages and difficulties in establishing the T & V System with several examples from the Indian experience. Concludes with an overall summary of the general objectives of the workshop in which many of these issues were discussed at length.

465. **Potash, B.** 1985. Female farmers, mothers-in-law and extension agents: Development planning and a rural Luo community in Kenya. In R. S. Gallin and A. Spring (Eds.), *Women creating wealth: Transforming economic development* (pp. 55-60). Washington, D.C.: Association for Women in Development.

Extension / Farmers / Women / Development policy / Kenya

Since most communities are not involved in special development projects, development depends on the efforts of the people and the assistance available to them through the normal administrative hierarchy of agricultural extension agents and community development

officers. Research was conducted in a Luo community to examine the effectiveness of the channels. Extension policies were found to be unsuited to local farming practices and not adopted. Communication was not directed to women and their mothers-in-law who farm and make the farm decisions, but to male elders. The paper describes the social organization of Luo farming and offers suggestions for improving policy planning, including modifying the role of extension agents. Discusses national policies which advocated the greater involvement of men in farming. Such policies threaten women's ability to feed themselves and their children. Since women and men have different economic responsibilities and patterns of income disbursement, an increase in the incomes of husbands will not necessarily benefit their wives. Suggestions are made for programs that may benefit women.

466. **Raalte, R. van.** 1984. Analysis of some extension projects. In *International Agricultural Centre, Seminar - Strategies for Agriculture Extension in the Third World* (pp. 311-332). Wageningen, The Netherlands: International Agricultural Centre.

Extension / Evaluation / Upper Volta / Zambia / Ghana / Egypt

Outlines some of the activities that are important for an extension office. Describes three fields of interest: (1) performance of the extension service; (2) relations with other services; and (3) relationship between extension service and clients. The next section briefly describes four Dutch agricultural extension projects in Upper Volta, Zambia, Ghana, and Egypt in relation to the previously mentioned fields of interest. The final section draws some conclusions from the analysis of the four projects.

467. **Rai, K. N., Panghal, B. S.** 1979. Districtwise return to investment in agricultural extension in Haryana. *Indian Journal of Agricultural Economics*, 34(4), 27-31.

Extension / Resource allocation / India

Examines the allocation pattern of agricultural extension investment in Haryana State. Studies resource productivity and analyzes regional variations in the marginal value of productivity of agricultural extension investment. Results indicate: (1) average agricultural extension investment ranged from 2 to 8.48 rupees per ha. of total cropped area in different districts, and its contribution to total agricultural production is second only to irrigation expenditure; and (2) the marginal productivity of agricultural extension investment is positive in each of the districts. Returns per rupee were higher in the rainfed and drought prone regions as compared to the irrigated region.

468. **Reddy, H. N. B., Singh, K. N.** 1977. Analysis of communication patterns and procedures used by village level workers in Karnataka State. *Indian Journal of Extension Education*, 13 (3/4), 19-26.

Diffusion of information / Communication / Information flow / Extension / India

Presents the results of a study to analyze the communication patterns and procedures used by village level workers in communication of farm information. The objectives of the study were: (1) to identify and analyze the information receiving patterns of village level workers in farm information; (2) to identify the information processing procedures followed by them; and (3) to find out information communicating patterns and procedures used by them to communicate to farmers.

469. **Rehman, T., Dorward, A.** 1984. Farm management techniques and their relevance to administration, research and extension in agricultural development: Part 1--Their evolution and use in developed countries. *Agricultural Administration*, 15, 177-189.

Management / Decision making / Agricultural development

First of two papers exploring farm management techniques and their relevance and use in developing countries. As a prelude to examin-

ing management techniques in development, their role in various developed countries is discussed in some depth. Identifies the primary clients of management techniques as farmers and government policy makers and administrators, while extension workers and technical research workers are classified as secondary groups. Planning, decision making, data collection, and communication are some of the techniques discussed.

470. **Rehman, T., Dorward, A.** 1984. Farm management techniques and their relevance to administration research and extension in agricultural development: Part 2--An appraisal of their potential in less developed countries. *Agricultural Administration*, 15, 239-253.

Management / Decision-making / Technology development / Technology transfer / Developing countries / Innovation adoption

Second of two papers examining management techniques and the role they can play in agricultural development, emphasizing extension. Describes the role of management including conditions necessary for successful application of management techniques and the potential benefits of management. Discusses decision-making at two levels, technology research and farmer adoption. Points out that management must play a role in designing and tailoring technology so that farmers' goals and social aspirations can be met.

471. **Rhoades, Robert...[et al.].** 1982. Interdisciplinary development and transfer of post-harvest technology at the International Potato Center. In Report of an exploratory workshop on the role of anthropologists and other social scientists in interdisciplinary teams developing improved food production technology (pp. 1-8). Los Banos, Laguna, Philippines: International Rice Research Institute.

Technology transfer / Technology development / Postharvest systems / Social anthropology / Potatoes / Training / Case studies / Peru

This case study of potato production and storage in Peru demonstrates how and why anthropologists can positively contribute to the generation and transfer of improved agricultural technology. Reports the effects of introducing an anthropologist into a CIP sponsored project in the Central Mantaro Valley of the Central Peruvian Andes to study post harvest activities and problems of highland farmers.

472. **Robins, J. S.** 1983. The role of international organizations in the transfer of technology in developing countries. In R. D. Williams (Ed.), *Communication of weed science technologies in developing countries: Proceedings of a symposium sponsored by the International Weed Science Society and the Weed Science Society of America* (pp.141-148). Corvallis, OR: International Plant Protection Center. (International Plant Protection Center document no. 49-B-83).

Technology transfer / Technology development / International agricultural research centers / Developing countries

Discusses the roles international and regional organizations play in agricultural technology development and transfer through conduct or support of research and development of technologies; through adaptation, testing, and applications of technologies; and through information generation, analysis, and synthesis.

473. **Roling, N.** 1984. Agricultural knowledge: Its development, transformation, promotion and utilization. In *International Agricultural Centre, Seminar - Strategies for Agricultural Extension in the Third World* (pp. 97-129). Wageningen, The Netherlands: International Agricultural Centre.

Diffusion of Information / Utilization / Information flow / Linkages / Technology development / Technology transfer / Adaptation

A paper originally prepared for the Third Expert Working Group on Information, Analysis

and Consolidation, Kuala Lumpur, Malaysia, 12-16 September, 1983, sponsored by UNISCO-UNISIST. Examines the relevance of agricultural experience for information consolidation. The paper looks at the following issues: (1) knowledge utilization systems including linkages between solution building subsystems and the information flows between them; (2) diffusion process and their basic dynamics; (3) new perspectives on technology development such as the farming systems methodology; (4) the transformation of agricultural knowledge; (5) utilization including the agricultural development mix and the role of information; (6) the problems of reaching the poorest farmers; and (7) issues in information consolidation.

474. **Roling, N.** 1985. Extension and the development of human resources: The other tradition in extension education. Paper presented at the AERDC Conference, 15th to 21st September, 1985, *Investing in Rural Extension: Strategies and Goals*, held at the Agricultural Extension and Rural Development Centre, University of Reading. Mimeographed. 18 p.

Extension / Human resources / Education

Discusses the relationships between the two traditions, technical innovation (TI) and human resources development (HRD). These two traditions should be seen as two dimensions of extension work which mutually reinforce each other. But in actual practice they function in opposition to each other with different supporters. The author is seeking change and support for a more balanced mix of TI and HRD. It means that extension as a professional field should develop its "instrumentarium" to redress the present imbalance.

475. **Rolis, M. J., Jones, G. E., Garforth, C.** 1985. The dimensions of rural extension. Paper presented at the AERDC Conference, 15th to 21st September, 1985, *Investing in Rural Extension: Strategies and Goals*, held at the Agricultural Extension and Rural Development Centre, University of Reading. Mimeo-

graphed. 15 p.
Extension

Sets the general scene for the AERDC Conference on Investing in Rural Extension: Strategies and Goals by discussing some common assumptions and precepts regarding extension. Covers briefly the origins of extension, the development of extension services, the dimensions of extension, and investments in extension.

476. **Ruttan, V. W.** 1983. International transfer of agricultural technology. Chapter 9 from the author's revised draft manuscript.

Technology transfer / Agricultural research / Technology development / Technical progress / Japan / Korea Republic / Taiwan

A compilation of Ruttan's work in the area of international agricultural technology transfer. Reviews the diffusion models and various phases of international technology transfer. Moves into its relationship with agricultural research and illustrates the concepts with examples from Japan, Taiwan and Korea.

477. **Ruttan, V. W.** 1973. Technology transfer, institutional transfer, and induced technical and institutional change in agricultural development. St. Paul, MN: Department of Agricultural and Applied Economics. 48 p. (Staff paper P73-16).

Technology transfer / Technical progress / Institutions / Induced innovations

The design of a successful agricultural development strategy involves a unique combination of technical and institutional change. It involves technical innovations capable of generating substantial new income flows. It also involves an adaptive response on the part of cultural, political, and economic institutions to realize the growth opened up by the new technical opportunities. This paper attempts to show how the addition of an induced innovation perspective can enrich our understanding of the process of technology

transfer in agricultural development. It also attempts to extend the induced innovation perspective to the process of institutional transfer.

478. **Sattar, A.** 1984. Information-seeking behavior of agricultural extension specialists: Its impact on the management of information services. In A. van der Loan & A. A. Winters, (Eds.), The use of information in a changing world, Proceedings of the forty-second IID Congress held in The Hague, The Netherlands 24-27 September 1984 (pp. 299-310). Amsterdam: North Holland. (IID publication 631).

Extension / Information services / Information needs / Illinois

Reports the results of a study of information-seeking behavior of agricultural extension specialists in the state of Illinois. Attempts to investigate how the extension workers search for information, what channels of communication they prefer, what information sources they use, and what their informal communication patterns are. Most of the extension specialists turned to personal sources to seek information. The actual information search and their perceptions resulted in different priorities for information sources showing that information need studies based only on opinions may not give a clear picture of the information needs. Recommends that the Department of Cooperative Extension in collaboration with the agricultural libraries should initiate programs of in-service education for extension workers.

479. **Sen, D.** 1981. Transfer of technology and agriculture infrastructure: A suggested paradigm of the innovation-decision process. In Management of transfer of farm technology (pp. 98-102). Hyderabad, India: National Institute of Rural Development.

Innovation adoption / Technology transfer / Infrastructure

Distinguishes between economic development in industrialized and developing countries and points out the importance of agriculture to the

latter. Emphasizes that provision of infrastructure is as important to the adoption of innovations as are socio-economic factors.

480. **Singh, D., Singh, R. I., Singh, V. K.** 1979. Returns from investment in extension service in agriculture. *Indian Journal of Agricultural Economics*, 34(4), 31-35.

Extension / Cost benefit analysis / India

Examines from the basis of cost benefit analysis of agricultural extension work conducted in Kanpur District, Uttar Pradesh (1976-79) the distinguishing features of the responses of a society to investment in extension vis-a-vis economic inputs. The aggregate cost-benefit ratio is 1:11 when costs and incomes of only rice, wheat and fertilizers have been taken into account. However, many important variables, particularly social and economic, have been omitted.

481. **Singh, N. P.** 1981. Problems and prospects of rural TV programming in India. In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 1: International experience in communication and innovation (pp. 263-271). Chichester, England: John Wiley.

Television / India

Highlights some of the problems of developing local programs and the prospects of using TV as an effective medium of communication in India. Focuses attention on the technology of software development of local training programs and the maintenance of television sets in developing countries.

482. **Usherwood, N. R. (Ed.)** 1981. Transferring technology for small-scale farming. Madison, WI: American Society of Agronomy. Proceedings of a symposium sponsored by Divisions A-4 and A-6 of the American Society of Agronomy in Chicago, Illinois, 3-8 December 1978. 132 p. (ASA special publication no. 41).

Technology transfer / Small farms

A collection of papers given at the American Society of Agronomy meetings in Chicago. Includes the following papers: (1) Significance of developing and transferring technology to farmers with limited resources by N. C. Brady; (2) Appropriate methodology for appropriate technology by Stillman Bradfield; (3) Agronomic and economic considerations for technology acceptance by Richard R. Harwood; (4) Mechanisms of interinstitutional transfer of technology and information exchange in Latin America by Fernando Fernandez; (5) Research and the promotion of the use of technology by Robert W. Waugh; (6) Technology transfer programs designed to assist small-scale and part-time farmers in the United States by D. B. Seastrunk; (7) Recent Brazilian experience on farmer reaction and crop response to fertilizer use by E. Malavolta and M. Rocha; (8) Highlights from 45 years of experience with whole-farm demonstrations by Gerald G. Williams; and (9) Involvement of U.S. organizations in technology transfer and research by Frederick E. Hutchinson.

483. **Utterback, James M.** 1975. The role of applied research institutes in the transfer of technology in Latin America. *World Development*, 3, 665-673.

Research / Technology transfer / Developing countries / Latin America

Explores the role of applied research institutes in the transfer of technology to developing countries. Several hypothesis about technological change in developed economies are extended to this new context. Investigates 20 projects from four institutes in order to generalize the hypothesis. The conclusions are that projects, where significant resources were devoted to defining issues and market needs, providing for interpersonal contact and communication, and developing personnel through work in firms or applied laboratories in other countries, were most likely to produce useful results. Suggests that increased focus on these issues could have high leverage in expanding the importance of research institutes' activities both in generating and

adapting technology and in transferring technology successfully.

484. **Vengroff, Richard.** 1984. The administration of rural development: the role of extension agents in Upper Volta and Zaire. *Rural Africana*, 18, 45-57.

Extension / Rural development / Upper Volta / Zaire

Examines the impact of problems faced by the agricultural extension agents. These problems are: (1) technical issues—the lack of successful technical packages; (2) manpower—the lack of sufficient numbers of trained agents; (3) resources—the lack of funds and/or logistical support to perform the extension function; (4) organizational support; and (5) societal relations. Advocates to relieve extension agents of some administrative burdens. Supports arguments for increasing client participation. Productivity-based measures may increase success in the field.

485. **Verhagen, K.** 1984. Co-operation for survival: An analysis of an experiment in participatory research and planning with small farmers in Sri Lanka and Thailand. In *International Agricultural Centre, Seminar - Strategies for Agricultural Extension in the Third World* (pp. 343-380). Wageningen, The Netherlands: International Agricultural Centre.

Organizations / Cooperatives / Groups / Small farms / Thailand / Sri Lanka

An extract from the book with the same title. The paper focuses on the operational problems of an action research, which in the village situation has sought to involve small farmers in the analysis of constraints by collective action in small co-operative groups. It also analyzes the prevailing 'big farmer' bias of official co-operatives and similar service organizations in four small areas in Sri Lanka and Thailand. By way of conclusion, it sets out the major characteristics of an alternative approach capable of generating more authentic forms of cooperative organization among the

poor majority of the farming population, i.e., small farmers, male and female, who most need this form of organization to counteract further deterioration in their living conditions.

486. **Voll, S. P.** 1980. A plough in field arable: Western agribusiness in third world agriculture. Hanover, NH: Published for University of New Hampshire by University Press of New England. 213 p.

Technology transfer / Agribusiness / Private sector / Developing countries

Examines a series of third world agricultural enterprises involving private or quasi private western firms in an attempt to identify the key elements of a successful large-scale project and the likely crucial problem areas. The projects are drawn from Africa and the Middle East over a more than 50 year period. Chapter 1 reviews the writings on multinational enterprises, technological transfer, and agricultural development. Few of these works are found relevant to the present study. In general, the literature on multinationals ignores the area of agricultural enterprises in the developing nations. Chapter 2 outlines the issues raised in any agricultural project and the specific forms they will take when a private foreign firm is involved. Chapters 3-5 apply the schema developed in chapter 2 to individual projects. The final chapter attempts to pinpoint the crucial elements of a successful project. It examines under what circumstances an agricultural project involving foreign private companies can increase a nation's agricultural output in the 1980's and what the developing nation must be willing to sacrifice to secure this output.

487. **Wallender, H. W., III.** 1979. Technology transfer and management in the developing countries: Company cases and policy analyses in Brazil, Kenya, Korea, Peru, and Tanzania. Cambridge, Mass.: Ballinger.

Technology transfer / Management / Case studies / Korea Republic / Kenya / Brazil / Peru / Tanzania

Although this study is directed toward the transfer of managerial technology in the industrial sector, many of the concepts are applicable to technology transfer in the agricultural sector. Chapter 2 provides a discussion of prevailing theories of technology transfer and their inconsistencies or applicability to questions of technology and development assistance and national planning. Chapter 3 summarizes the major factors affecting the transfer of technology at the user firm level. Chapter 4 indicates policy implications of the research program. Appendix II describes the research program and includes a bibliography on the research methodologies used in this study.

488. **Weidemann, C. J.** 1985. Extension systems and modern farmers in developing countries. *Agriculture and Human Values*, 2, 56-59.

Extension / Home economics / Diffusion of information / Women / Developing countries

Describes the cultural based nature of home economics that is a consequence of its particular development in the United States. A male agricultural extension service, when transferred overseas, has cultural and value underpinnings that have made the content of training and technical expertise inappropriate or ineffective under conditions in developing countries. To an even greater extent Home Economics Extension, which was aimed primarily at women, has had problems in developing countries in responding to the actual activities of women in rural settings. Home economics, both domestically and overseas, has traditionally ignored farm women's production work because it has had an implicit commitment to certain cultural norms about the proper role of women. These norms may have served some function during a time in the United States when the sex ratio was heavily male-biased. In developing countries, however, where sex ratios in rural areas are often skewed toward females, male temporary migration is the rule rather than the exception, and women have traditionally

been the producers of food. To be effective in these contexts, home economics extension must meet women's production needs as well. The author argues that home economics extension, in providing a women-oriented extension service, must take into account both the productive and reproductive roles of women, and serve to help women better integrate them in their activities.

489. **Weiss, C., Jequier, N. (Eds.)** 1984. *Technology, finance and development: An analysis of the World Bank as a technological institution*. Lexington, MA: Lexington Books. 343 p.

Technology transfer / Technical aid / World Bank

The contributors to the volume analyze cases illustrating the full scope of the Bank's technological development projects. They shed new light on the process of technology choice in development including both the hardware (equipment, machinery, tools) and the software (managerial methods, training programs, institutional organization) of development. The examples cover a wide range of technological projects: improved water supply and sanitation, remote sensing, agriculture, industry, engineering, water resources, and others. Offers rare insights into the organization and management of international research projects.

490. **Woods, J. L.** 1980. *Agricultural extension and communication— Why, what and for whom*. Bangkok, Thailand: UNDP Asia and Pacific Programme for Development Training and Communication Planning. Paper presented on 28 January 1980 to an Inter Country Seminar on Agricultural Extension and Communication Programmes at the Extension and Training Centre, Kasetsart University, Bangkok, Thailand. 17 p. (RB no. 372).

Technology transfer / Extension / Communication / Rural development

Provides an overview of agricultural extension and communication through charts.

62 Technology Transfer

Reviews a number of considerations taken into account in developing an extension or agricultural communication program. Enumerates the requirements of agricultural communication and extension specialists as follows: (1) to build a bridge between the needs of farmers and requirements of the policy decision makers; (2) to understand the complex organizational system within which they work, (3) to work closely with those responsible for other types of functional inputs required for the overall program; and (4) to understand the overall program planning and implementation strategy.

491. **Zandstra, H.,...[et al.]**. 1979. *Caqueza: Living rural development*. Ottawa: International Development Research Centre. 321 p. (IDRC-107e).

Technology transfer / Diffusion of information / Rural development / Small farms / Colombia

This book tells the story of the relationships between three groups of people in the Caqueza region of Colombia. The largest group consists of Colombian small farmers with limited resources and education trying to make a living out of 2-4 hectares of land. The smallest group is made of politicians and planners formulating a national agricultural development policy to improve the lot of the small farmers and planners by developing production strategies for the transfer of technical, economic, and social knowledge to small farmers. This book traces the progress of the 5-year period during which the National Government gave considerable priority to the small farm sector. Describes the successes and failures accompanying the process of establishing a flexible methodology for the development of a typical Andean agricultural area. A new agricultural production technology must be based on the small farmers real needs and not on what the outsiders consider the needs to be.

Technology Utilization

492. **Appa Rao, G., Rogers, E. M., Singh, S. N.** 1980. Interpersonal relations in diffusion of an innovation in two Indian villages. *Indian Journal of Extension Education*, 16, 19-24.

Diffusion of information / Innovation adoption / Information flow

Examines how individuals are connected to each other by communication flows in a social system and its effect on diffusion and adoption of innovation. The majority of farmers in villages seek information on farm and other related matters from their friends, neighbors and relatives which speaks of the role of interpersonal communication in diffusion of innovations. Farmers in a progressive village sought information on high yielding wheat varieties from the best farmers of the village and farmers in non-progressive villages sought information from their friends. A similar trend was observed in diffusion of high yielding rice varieties information in an innovative and a non-innovative village. Relates the interpersonal relationships with the adoption of particular innovations.

493. **Berardi, G. M., Geisler, C. C. (Eds.)** 1984. The social consequences and challenges of new agricultural technologies. Boulder, CO: Westview Press. 376 p. (Rural studies series).

Utilization / Economic sociology / Agricultural policy

This collection brings together historically relevant research and a carefully chosen cross section of contemporary work documenting the effects of new technology throughout the twentieth century. The review of literature is followed by an evaluation of the effects of mechanization on labor and production, written in 1904, which provides a backdrop for papers from the 1940s and 1950s examining the mechanization of agriculture in the South, in the Midwest and in rural areas in general. Subsequent chapters offer present-day insights on such topics as the socio-economic consequences of automated vegetable and tobacco harvesting, center-pivot irrigation, and organic and no-till cultivation. The authors also look at compensation and adjustment programs for

displaced labor, the relationship between technology and agribusiness growth, and the effectiveness of university programs that prepare students to perform social impact assessments in agriculture. Concludes with a discussion on new directions for the study of the social impacts of farm technology and the political economy of agriculture.

494. **Byres, T. J.** 1982. The political economy of technological innovation in Indian agriculture. In R. S. Anderson, P. R. Brass, E. Levy, and B. M. Morrison (Eds.), *Science, politics, and the agricultural revolution in Asia* (pp. 19-75). Boulder, CO: Published by Westview Press for the American Association for the Advancement of Science. (AAAS selected symposium 70).

Innovation adoption / Social change / Social classes / India

Tries to assess what influence, if any, the technological innovations that have been introduced into Indian agriculture since the mid-1960's have had upon the process of class formation and upon class action in the countryside. Attempts, further, to consider the significance of any such process of rural class formation and of rural class action; for urban class formation and action; to identify the major contradictions which may be generated by these processes and actions; and to suggest some of the relevant political implications, especially with respect to Indian state power and its class basis.

495. **Chamala, S.** 1981. Differential source-utilization patterns: At awareness stages in the progressive and non-progressive villages in India. In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 1: International experience in communication and innovation (pp. 281-291). Chichester, England: John Wiley.

Information flow / Communication / Utilization / Diffusion of information / India

Compares the flow of information and communication patterns in the high-yielding

varieties program in a progressive and non-progressive village in India. All 56 villages of Kanjhawala block in Delhi territory were classified into "progressive", "developing", and "non-progressive" categories on the basis of the use of high-yielding varieties of wheat and fertilizer consumption. The findings that the progressive and non-progressive villages differed significantly with respect to source utilization at awareness stages and that a significantly larger portion of farmers of the progressive village were aware of high-yielding wheat varieties through institutionalized sources than those of the non-progressive village could be utilized by extension workers in hastening the dissemination of information. The larger number of steps to awareness required in non-progressive villages is useful information when selecting appropriate dissemination media and methods.

496. **Cummings, R. W., Jr.** 1977. Minimum information systems for agricultural development in low-income countries. New York: Agricultural Development Council. 14 p. (A/D/C seminar report, no. 14).

Diffusion of information / Information services

The report of a meeting on Minimum Information Systems for Agricultural Development in Low Income Countries in Oxford to discuss problems and approaches in the development of more adequate information systems. Summarizes the major points in the papers presented. Identifies the principal users of agricultural information and the types of information they read. Identifies the principal suppliers of agricultural information and the types of information they can provide. Reviews some of the more critical methodological issues in supplying information. Discusses institutional arrangements for collecting, processing and analyzing information and identifies some critical areas for future action. The discussion focuses on the supply of information about agricultural commodities which can be generated within the agricultural sector. The strategic part of information systems is the careful design of

the systems as part of the overall social system. The function of the minimum information system is to produce information to respond to uncertainty and to promote positive change.

497. **Farrington, J.** 1977. Research-based recommendations versus farmers' practices: Some lessons from cotton-spraying in Malawi. *Experimental Agriculture*, 13, 9-15.

Utilization / Technology development / Cotton / Pest control / Malawi

Discusses the discrepancy between farmers' performances and research based recommendations in the control of cotton pests in Southern Malawi. Analysis of the former in two seasons revealed that the farmers' low levels of insecticide application approached the economic optimum, whereas several factors of economic importance were omitted from the research-based justification of high spraying levels. Makes recommendations for improving the applicability of research recommendations to smallholder farming with particular reference to the farming risks that arise from uncertain rainfall, the wide range of farming ability encountered in practice, and the dangers of a typically high levels of management in research experiments.

498. **Fliegel, F. C., Kivlin, J. E.** 1962. Differences among improved farm practices as related to rates of adoption. University Park, PA: Agricultural Experiment Station, College of Agriculture, Pennsylvania State University. 18 p. (Bulletin 691).

Innovation adoption / Utilization

Presents the results of a study of the extent to which the rate of adoption of new managerial and technological practices is related to their cost, complexity, and other attributes. Adoption rates for 43 farm practices were determined from the adoption histories of 229 commercial dairy farmers. Relationships between attribute ratings established during the study and known rates of adoption were determined. Farm practices

which rated low in complexity and high in compatibility and saving of time were adopted more rapidly than others. Those rated high in mechanical attraction and saving of physical discomfort also tended to be adopted rapidly but the correlations were not statistically significant. The data showed that high initial cost, high continuing costs, and a slow rate of cost recovery are not necessarily deterrents to rapid adoption. Two other attributes, association with dairying and divisibility for trial, were not associated with rate of adoption.

499. **Galjart, B.** 1971. Rural development and sociological concepts: A critique. *Rural Sociology*, 36, 31-41.

Innovation adoption / Social structure / Technical progress / Developing countries

Argues that the usual contents of the concepts "modern" and "traditional" are insufficient to account for the presence or absence of agricultural development. The use of the concepts may even have led to a certain neglect by rural sociologists of the structural factors affecting development. Suggests a more accurate way of classifying the variables influencing the farmers' innovativeness under the headings "ignorance," "inability," and "unwillingness."

500. **Gartrell, John W.** 1977. Status, inequality and innovation: The Green Revolution in Andhra Pradesh, India. *American Sociological Review*, 42, 318-337.

Innovation adoption / Social structure / Technology utilization / India

Analyzes data from samples of cultivators in 84 agrarian communities in Andhra Pradesh, India. Finds little support for Cancian's theory that rank inhibits risk-taking. Considers the possibility that the status-trial relationships varied systematically across communities, with mixed results. While there were lower zero-order correlations between status and trial for cultivators in high resource, low inequality communities, analysis of interactions between community characteris-

tics and individual level measures was not particularly informative.

501. **Gartrell, John W., Gartrell, David C.** 1979. Status, knowledge and innovation. *Rural Sociology*, 44, 73-94.

Innovation adoption / Social structure / Technology utilization / India

Examines the conditions under which cultivators in 84 agrarian villages within the Indian state of Andhra Pradesh adopted green revolution technology. Social status or resources and awareness are viewed as necessary but not sufficient conditions for the trial of innovation. A multiplicative model was specified to examine their effects. At higher levels of education, awareness was translated into trial at a high rate. In villages where awareness and resources were relatively highly concentrated, the rate of translation of awareness into trial was higher.

502. **Garza Falcon, G.** 1981. The adoption of recommended agricultural practices by three different types of farmers in Mexico. In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 1: International experience in communication and innovation (pp. 185-194). Chichester, England: John Wiley.

Innovation adoption / Maize / Mexico / Extension

Reports the results of a survey conducted among three groups of Mexican farmers — the "independientes", the "ejidatarios" and the "sequeños propietarios" — concerning the adoption of hybrid maize and six associated practices. The groups traditionally differ in their receptiveness of change and adoption behavior. Some recommendations suggested by the study are: (1) more and better trained agricultural extension service personnel; (2) the extension service should work with the ejidatarios as a separate group because of their distinctly lower educational level; (3) the agricultural extension service, and other government agencies should place more

emphasis on recommended practices; and (4) additional research is needed to understand factors which affect adoption of better farming practices, especially social and cultural differences.

503. **Greene, B. A.** 1970. Rate of adoption of new farm practices in the Central Plains, Thailand. Ithaca, NY: Department of Agricultural Economics, Cornell University. 46 p. (Occasional paper no. 41 - Cornell University-USAID Prices Research Project).

Innovation adoption

Discusses farmer response to fertilizer, tractor ploughing, water pumps, insecticides, herbicides, crab killer, and rice double cropping. The main area of interest is the inter-relationship between economic and non-economic factors as determinants of the adoption of these relatively new practices by a random sample of 142 farmers in one amphoe of the central plains of Thailand. Conclusions support two main hypotheses: (1) both economic and non-economic factors should be considered; and (2) each innovation should be studied as an entity in itself. More attention should be given to improving the existing irrigation system as this was the key to greater yields, farm income, and appeared to interact with the adoption of other new farm practices. Increasing use of new inputs could be encouraged by making these more available at the village level.

504. **Gutkind, E., Zilberman, D.** 1980. An economic approach to the diffusion process. Berkeley, CA: Giannini Foundation of Agricultural Economics, University of California. 18 p. (Working paper no. 159).

Utilization / Economic evaluation /
Innovation adoption / Technology transfer

Empirical works found that the rate of diffusion of new technology is an S-shaped function of time. The prevailing theoretical explanation of these observations treats diffusion as a continuous process of imitation or communication among adopters. Introduces

an alternative model for the adoption of new processes by industry based on microeconomic theory. Demonstrates that S-shaped diffusion curves can be explained by profit maximization, increasing returns to scale of the new technology, the dynamics of input prices, and the size distribution of forms within an industry. The analysis can be applied to the diffusion of new technology among agricultural firms.

505. **Havelock, R. G.** 1969. Planning for innovation through dissemination and utilization of knowledge. Ann Arbor, MI: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan. Various pagings.

Information flow / Utilization

Provides a framework for understanding the processes of innovation, dissemination, and knowledge utilization (D & U) and reviews the relevant literature in education and other fields of practice within this framework. D & U is viewed as a transfer of messages by various media between resource systems and users. Major sections analyze characteristics of individuals and organizations which inhibit or facilitate this transfer. The process is interpreted at four levels: the individual, the interpersonal, the organization, and the social system. Additional chapters analyze messages, media, phase models, and knowledge-linking roles. Models of D & U can be grouped into three perspectives: (1) "Research Development and Diffusion"; (2) "Social Interaction"; and (3) "Problem Solving". A "linkage" model is proposed as a synthesis. Successful linkage is achieved when user and resource system interact collaboratively, simulating each other's problem solving behavior. Seven factors highly related to successful D & U are: (1) linkage to internal and external resources; (2) degree of structure in resource system, user, message and medium; (3) openness of user and resource systems; (4) capacity to marshal diverse resources; (5) reward; (6) proximity to resources and other users; and (7) synergy, i.e., the variety, persistence, and synchronization of messages and media. Implications are

drawn for research, development, practice and policy.

506. **Hodgdon, L. L., Singh, H.** 1966. Adoption of agricultural practices in Madhya Pradesh: Factors associated with the adoption of recommended agricultural practices in two villages. Hyderabad, India: National Institute of Community Development.

Utilization / Information flow / Innovation adoption / India

Presents the factors affecting adoption in the villages studied and analyzes them at 3 levels--the individual farmers (situational), the village level (local), and influences originating in the world outside the narrow confines of the village (external). Important situational factors affecting adoption include size and fragmentation of land holdings, dearth of production resources, etc. Personal and social characteristics of farmers (age, caste, etc.) play a relatively minor role in adoption. At the local level, formal and informal leaders play an imperceptible role in encouraging adoption. The external factors such as prices, credit, production supplies, irrigation water, etc. are delineated and discussed in detail. Overall, a desire for higher productivity and incomes was reflected if means could be found for overcoming the present difficulties.

507. **Knott, J., Wildavsky, A.** 1981. If dissemination is the solution, what is the problem? In R. F. Rich (Ed.), *The knowledge cycle* (pp. 99-146). Beverly Hills, CA: Sage Publications.

Diffusion of information / Information flow / Utilization / Policy / Decision-making

Discusses the dissemination of knowledge in relation to its utilization. There appear to be at least three obstacles to the use of knowledge by decision makers: (1) knowledge does not exist; (2) decision makers are ignorant of knowledge that does exist; and (3) decision makers know about knowledge but refuse to utilize it. Delineates seven levels of utilization and emphasizes the need to keep the

levels distinct and to relate strategies of dissemination to a particular level of utilization using the seven standards of utilization. The authors then proceed with several examples of dissemination efforts and possible reasons for whether or not the knowledge was actually utilized. Outlines some of the pitfalls of premature or inappropriate dissemination. Lastly, they outline three types of linkage strategies which might be substituted when diffusion processes fail: (1) moving information from the place where it was developed to the place where it is needed; or (2) moving people by bringing together producers of studies with policy makers who want to learn about their findings; or (3) trying to stimulate diffusion by designing incentives to overcome the obstacles.

508. **Leaf, M. J.** 1984. *Song of hope: The Green Revolution in a Panjab village*. New Brunswick, NJ: Rutgers University Press. 281 p.

Utilization / Green revolution / Social change / India

An anthropological study of the Sikh village of Shahipur in the Panjab before and after the Green Revolution to assess whether life had changed in the village. Explaining the changes and increased options on daily life, the author shows how four villagers weighed their alternatives and decided on strategies during the Green Revolution. The information they needed to make choices had changed, but the skills they needed, learned through the kinship system and their religion, remained the same. Maintains that the values found in the kinship system, the Sikh religion, and the political party have supported modernization. Suggests there are several lessons to be learned from this case study for development planners.

509. **McAllister, J.** 1981. *Rural innovators: A struggle for power*. In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 1: *International experience in communication and innovation* (pp. 135-145). Chichester, England: John Wiley.

Social behavior / Innovation adoption / Models / New South Wales

Seeks to formulate a conceptual framework to explain the innovative behavior of potato growers in New South Wales. The model takes into consideration the local community in which farmers live and the idea that their community is part of the wider society. Shows that Galjart's concept "distribution of resources" is particularly useful as a first step in classifying local communities with regard to their likely reaction to innovations. Shows that the dichotomy between those possessing power and those who do not must be borne in mind when studying any empirical situation.

510. **Rajagopalan, C., Singh, J.** 1971. Adoption of agricultural innovations: A sociological study of the Indo-German Project Mandi. Delhi: National Publishing House.
Utilization / Innovation adoption / Sociological analysis / Communication / India

The study aims to find out (1) to what extent various improved agricultural practices recommended under the Indo-German Project have found acceptance by the farmers and (2) to locate and identify the factors which help or hinder their acceptance. The emphasis was on the socio-cultural factors, although other factors were not excluded. The study established the close connection between communication and the degree of adoption. It also found that adoption tends to vary in direct relation to the level of economic conditions. Points out that the major obstacles in the way of adoption of certain agricultural practices is the lack of certain prerequisites, inadequacy of necessary facilities, and non-availability of required inputs in time and on reasonable terms.

511. **Rich, R.F. (Ed.)** 1981. The knowledge cycle. Beverly Hills, CA: Sage Publications. 222 p.
Diffusion of information / Utilization / Linkages / Bibliographies

Includes critical review essays in the sub areas of the knowledge cycle--creation, diffusion, utilization--as well as a review article on linkages between these sub areas. Two other articles are included which contribute to a basic understanding of the state of the art of the field: (1) a historical overview of the roots and traditions and empirical studies in the field; and (2) a review essay on the dissemination process. Each section is followed by an extended bibliography.

512. **Sabato, J. F.** 1983. Agriculture in the Argentine Pampas: Technology adoption in corn cultivation from 1950 to 1978. In M. Pineiro and E. Trigo (Eds.), Technical change and social conflict in agriculture: Latin American perspectives (pp. 71-124). Boulder, CO: Westview Press.
Technology transfer / Innovation adoption / Public sector / Argentina / Agricultural development / Policy

Presents an extensive examination of agriculture in the Argentine pampas with special attention given to technology adoption. Detailed account addresses the questions: (1) why did technical progress cease for a twenty-year period, from World War II to the 1960s, and what caused it to begin again, (2) why was better land use not emphasized, especially as it was becoming somewhat scarce, and (3) why did agricultural producers not have the incentive to use available resources to achieve full productive capacity? A single commodity, corn, was studied to examine these questions. Producer behavior, risk, land allocation and public policy are discussed. Supplemented by numerous tables and figures.

513. **Sattar, A., Lancaster, F. W.** 1984. The role of the information specialist in the dissemination of agricultural information. Urbana, IL: International Program for Agricultural Knowledge Systems, Office of International Agriculture, University of Illinois at Urbana-Champaign. 11 p. (INTERPAKS series no. 2).
Information flow / Information services

Describes the unique aspects of information services in agriculture that are not necessarily common to other disciplines. Delineates the various levels of users of agricultural information (e.g. scientific, extension and trade) and the special needs of each group. Concludes with a section on the competencies and skills required of agricultural information specialists to meet the information needs of the larger agricultural community.

514. **Shingi, P. M., Fliegel, F. C., Kivlin, J. E.** 1981. Agricultural technology and the issue of unequal distribution of rewards: An Indian case study. *Rural Sociology*, 46, 430-445.

Technology transfer / Agricultural development / Case studies / Innovation adoption / India

Explores the long-term implications of the diffusion of agricultural innovations. Data from a sample of 228 Indian farmers were collected in order to determine the effects of differential acceptance of improved agricultural technology on changes in equality of reward distribution over time. Shows that inequality increases over time with respect to gross agricultural production. But lagging behind in adoption of agricultural technology has to be answered in the negative. Notes that inequalities in both level and standard of living are reduced over time. Early failure to adopt ag-

ricultural technology does not seem to lead to disadvantage. Discusses the results in terms of the assumptions made about categories of adopters in diffusion research, and in terms of equity assumptions with regard to technological change.

515. **Westermarck, H.** 1981. Demonstration farmers' role in the adoption of innovations. In B. R. Crouch and S. Chamala (Eds.), *Extension education and rural development*. Vol. 1: International experience in communication and innovation (pp. 309-317). Chichester, England: John Wiley.

Diffusion of information / Interpersonal relations / Communication / Innovation adoption

Shows the place of interpersonal communication and influence in the diffusion and adoption of recommended farm practices with particular emphasis on the role of the demonstration farmer. Results show that although farmers learn from other farmers to a considerable extent, they do not learn from just anyone. The study confirms that farmers, who have close contacts with extension service and other outside sources of information and who are also socially integrated in their own system and respected by their peers have a great potential for spreading new farming information to their colleagues.

Reference

516. **Food and Agriculture Organization of the United Nations.** 1984. Socio-economic indicators relating to the agricultural sector and rural development. Rome: Food and Agriculture Organization of the United Nations. 104 p. (FAO economic and social development paper 40).

Agricultural development / Rural development / Indicators / Developing countries

Provides a compendium of internationally comparable series of statistical indicators which are currently available through the FAO ICS data bank. Includes statistics on population and labor force, land use, livestock, farm machinery, agricultural production requisites, agricultural production, agricultural trade, nutrition, and self-sufficiency in food.

517. **International Agricultural Development Service.** 1981. Agricultural development indicators: Statistical comparisons of 139 developing countries. New York: International Agricultural Development Service. 3rd edition. 17 p.

Agricultural development / Indicators / Developing countries

Includes 25 indicators on population, child mortality, physical quality of life, gross national product, cereal production and output, land use, fertilizer use and tractor density for 139 developing countries.

518. **Leatherdale, D., Tidbury, G. E., Mack, R.** 1982. AGROVOC: A multilingual thesaurus of agricultural terminology. Rome: Published by Apimondia for the Food and Agricultural Organization of the United Nations and the Commission of the European Communities. English version, 530 p. Trilingual index: Spanish-English-French, 306 p.

Agriculture / Thesauri

Presents an extensive listing of descriptors, or terms, required to retrieve bibliographic data contained in the International Information System for the Agricultural Sciences and Technology (AGRIS), co-ordinated by the Food

and Agricultural Organization of the United Nations (FAO). AGROVOC focuses on world agriculture, relating primarily to the applied facets of this wide field. Where biological topics are treated academically, they are not included in the listing. The listing is arranged alphabetically and hierarchically with emphasis put on effective retrieval. This version of the thesaurus is in English. It is also published in French, German, Italian, and Spanish.

519. **MacKay, S. E.** 1984. Field glossary of agricultural terms in French and English: Emphasis—West Africa. West Lafayette, IN: Purdue University. 103, 94 p.

Glossaries / Agriculture

Designed as a reference work for both expatriate and African agricultural specialists. It consists of a list in both French and English of 3500 technical agricultural terms commonly encountered in Africa.

520. **Roman, M. D.** 1983. Directory of development resources. Washington, D. C.: U.S. Agency for International Development, Division of Publications and Information. 337 p.

Development / Organizations / Directories

Describes international, regional, and national organizations; U.S.-based and AID-funded services; newsletters and journals; and data base services of development-oriented resources in both the United States and abroad.

521. **Tidbury, G. E.** 1983. CAB thesaurus. Farnham Royal, Slough, England: Commonwealth Agricultural Bureaux. 2 v.

Thesauri / Agriculture

Contains a listing of terms, one or more of which is required to retrieve information from the Commonwealth Agricultural Bureau's computerized bibliographic database. The terms are indexed alphabetically and sorted into hierarchies which may include up to seven

levels. While the listing is primarily agricultural, other fields are also included, such as engineering and meteorology. The thesaurus contains 48,000 terms chosen on the basis of frequency of occurrence and ease of retrieval. English spelling predominates where American and English alternatives exist.

522. **World Bank.** 1985. World development report 1985. Washington, D.C.: World Bank. 243 p.

Statistics / Indicators / Capital formation / Economic development / Finance / Economic policy

Focuses on the contribution that international capital makes to economic development. Emphasizes the growing interdependence between industrial and developing countries and shows how financial links have become as integral to the world economy as trade has hitherto been. The report looks at questions that have been raised about the role of international capital in economic development. It examines these questions from a broad and

long-term perspective and emphasizes that international capital can promote global economic efficiency and can allow deficit countries to strike the right balance between reducing their deficits and financing them. It analyzes the financial links between industrial and developing countries and addresses the question of why some countries have borrowed and encountered debt-servicing difficulties, while others have not. Reviews prospects for the next five years and concludes that there are policy choices available to governments that would contribute to faster and more stable growth and improved credit worthiness for every group of developing countries. Outlines policy objectives for industrial and developing countries and emphasizes that these policies need to be complemented by collaboration between debtors and creditors, including multiyear debt restructurings, in the context of countries' adjustment efforts. A statistical appendix, multicolored maps, and several graphics supplement the text. The final portion "World Development Indicators" presents tables containing economic and social profiles of 126 countries.

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