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A.I.D. Land Reform

PART I

AGRICULTURE ON MARGINAL LANDS

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AGRICULTURE ON MARGINAL LANDS: AN ECOLOGICALLY ORIENTED, ANNOTATED BIBLIOGRAPHY

Introduction

This bibliography was originally motivated by a concern for peasant farmers in developing countries who farm marginal or unproductive lands. One group of peasant farmers was originally of particular interest, i.e., those who have in some way participated in a land redistribution program. Such farmers have often been assigned land which is not of the highest quality, particularly by programs of colonization or agrarian reforms which make land owners out of renters, sharecroppers or even non-farmers.

Notwithstanding this initial interest, the bibliography has a more general focus, in that the marginal land problems of colonization or agrarian reform beneficiaries are not peculiar to them, but rather plague many small, poor farmers in a variety of contexts. The bibliography, therefore, has attempted to collect studies of two problems: (1) what factors seem to propel the degradation of croplands and thereby the creation of "marginal lands"? and (2) what might be done to regenerate lands which are unproductive, what might be the costs of such regenerative efforts, and under what conditions should such efforts be undertaken?

This first draft was prepared through a general and widely based literature search. It was not intended to focus on specific types of marginal lands or regions, although subsequent versions should classify studies more specifically. The present version is multidisciplinary, in that it includes economic, technological, and policy studies. It is ecologically oriented in that it includes studies of permanent agricultural systems where people use land and other resources in relatively equitable and creative ways; it also includes studies of degenerating agricultural systems where people and land become marginal and where the system itself is breaking down.

The following bibliography is far from complete. It is intended to provide a base to build upon, to expand and to develop useful classifications. It does not deal only with marginal lands problems of underdeveloped countries, but with rather the general phenomena of land and people becoming marginal, or the regeneration of agricultural systems in "developed" and "developing" countries.

Agrawal, R.C. (editor)

A Study of Hill Agriculture in Almora (India): Present Status and Future Strategy for Development, Post-Graduate Training Centre for Agricultural Development, Institute of Socio-Economics of Agricultural Development, Technical University of Berlin, 1976, 195 pp.

The study covers four areas of agriculture: crop production, animal husbandry, extension organization and socio-economic aspects (p. 4). The main purpose of the study was to provide on-the-job training for the team members. The report suggests some steps for improving crop and livestock husbandry and increased crop production. It emphasizes the adaptior of appropriate technology for tapping water and energy resources, and the development of crop and livestock enterprises.

Agrawal, Ramesh Chandra

"Strategies for Development of Hill Agriculture in India," in Zeitschrift fur auslandisch landwirloshaft 16:2, 1977, pp. 146-159.

The paper provides an overview of the special attributes to hill agriculture and what that means for development. It briefly outlines and integrates strategy for agricultural development that have sectional, spacial and temporal dimensions. The author states that a development policy must be towards economic self-sufficiency and not only food self-sufficiency.

Barnett, Tony

The Gezira Scheme: An Illusion of Development, Frank Cass and Company Limited, 1977, 180 pp.

The book provides a critical evaluation of the Gezira Scheme. The author states, "It is the argument of this book that the Scheme cannot really be considered as a successful example of development. On the contrary, it is stagnant, holds little hope of continually rising living standards for its inhabitants, and, as a major component of the Sudanese economy, it exposes that economy, and thus the society, to considerable potential and actual instability." The book provides a framework for comparing the success, or lack of, to Gaitskell's evaluation of the Gezira Scheme.

Basivas, Asit K.

"Agricultural Development and Environment," Mazingira, No. 11, 1979, pp. 7-13.

The article focuses on the negative effects of the development process, i.e., loss of soil, pest control and toxic effects, irrigation and the spread of waterborn diseases. The author's theme is to work with nature and not against it, as the long-term strategy for increasing food production.

Benjamin, McDonald P.

Investment Projects in Agriculture: Principles and Case Studies, Longman Group Ltd., United Kingdom, 1981, 285 pp.

The author's objective is to assist practitioners of agricultural development in LDCs to improve their ability for designing, preparing and implementing projects. In that framework the book reviews several case studies of agricultural development projects.

Bennett, John W.

Of Time and the Enterprise: North American Family Farm Management in a Context of Resource Marginality, University of Minnesota, 1982, 482 pp.

The book is a case study of agricultural activities in southwestern Saskatchewan, North America over a period of twelve years. The authors are anthropologists, and their study focuses on social, economic and ecological analyses. Their study of the area led them to look at the conduct of agricultural activity as an organized adaptive system.

The book examines the agri-family system, the roles of the family members. It looks at their coping with the physical resources and the economic environment. It is a study of resource management style and community interaction in an agricultural setting.

Berry, Wendell

The Unsettling of America: Culture and Agriculture, Sierra Club Books, 1977, 228 pp.

The book constitutes an epic description of the interrelationship of agriculture, culture and the ecological makeup. It is based on a deep understanding of the requirements for an ecological balance. The book can provide the agricultural development specialists of any country with a sound workable approach to reclaim marginal lands and build a self-sustaining agricultural production base. In the chapter on "Margins" the author discusses Andean farmers who live in four different climatic zones, requiring four different types of agriculture. He explains how these farmers cope with the hazards of different agricultural problems, i.e., soil erosion, diseases, etc., without industrial technology. He provides other examples of sound animal, plant and soil husbandry.

Biggs, Huntley N. and R.L. Tinnermeier (editors)

Small Farm Agricultural Development Problems, Colorado State University, Fort Collins, Colorado, 1974, 168 pp.

The book pulls together various aspects of small-scale, subsistence farmers. The articles represent an interdisciplinary view of problems of subsistence farming in LDCs. Some of the more relevant articles are: Chapter 3: "Some Aspects of Resource Management by Traditional Farmers," by Gene C. Wilken; Chapter 5: "The Adoption of New Agricultural Inputs and Practices by Indian Farmers," by Linwood L. Hodgdon; Chapter 7: "Livestock Production on Small Farms as a Contribution to Economic Development," by Gerald M. Ward; Chapter 9: "New Technologies for Small Farmers: The Puebla Project," by Huntley Biggs.

Bookchin, Murray

"Ecology and Revolutionary Thought," in Antipode, Vol. 10:3, Vol. 11:1, double issue, 1979, pp. 21-32.

The author's theme is that people are undoing the organic evolution of the earth, they are replacing a highly complex organic environment with a simplified, inorganic one that focuses on technical inventions in order to dominate nature. The notion of people dominating nature is tied directly to the domination of persons by persons. If the reversal of the evolutionary process continues, the preconditions for high forms of life will be irreparably destroyed. The author sees the cause of the ecological destruction not as a world of scarcity but a "world of meaningless wants and needs. Production for the sake of production" (p. 22). He states that the environmental movement stands at a crossroads in its development. Will it follow the path of adapting to existing society or a path of revolutionary opposition? "And can the earth survive its exploitation long enough to replace the present destructive social system with a more humanistic ecologically oriented society?" (p. 26).

Boserup, Ester

The Conditions of Agricultural Growth: The Economics of Agrarian Change Under Population Pressure, Aldine Publishing Company, 1965, 121 pp.

The aim of the study is to show that agricultural developments are caused by population trends. In the process the author explains the different systems of agriculture, the interdependence of land use and technical change and the human adaptive behavior to changing needs.

Bromley, Daniel W.

"The Development of Natural Resource Economics: Concepts and Their Relevance to Development Countries," Center for Resource Policy Studies, School of Natural Resources, College of Agricultural and Life Sciences, University of Wisconsin, Madison, Working Paper No. 14, June 1979, 31 pp.

The paper outlines content and development of natural resource economics, from the author's viewpoint, and its relevance to LDCs. The author discusses certain concepts in natural resource economics which transcend cultural differences. Examples of specific resources are used to explain certain concepts of natural resource economics and cultural differences.

Bromley, Daniel W.

"Economic Issues in Forestry as a Development Program in Asia," Center for Resource Policy Studies, School of Natural Resources, College of Agricultural and Life Sciences, University of Wisconsin, Madison, Working Paper No. 16, March 1982, 21 pp.

The paper includes a discussion on the process of development, defined here as problem solving at both local and national levels. It defines "technology" as a combination of techniques and institutions. In order for new techniques to be successful at local levels, where agricultural production takes place, those techniques must be combined with the local institutional structure. Forestry as it relates to technique and institution is considered with forest technology as a

development of plant life and institutional arrangements that contr access to the produce from land. The author states that when forestry is understood in those terms it can provide economic opportunity.

Bromley, Daniel W., Donald C. Taylor, Donald E. Parker

"Water Reform and Economic Development: Institutional Aspects of water Management in Developing Countries," Economic Development and Cultural Change 28:2, January 1980, pp. 365-387.

Irrigation projects are a means to increase needed food production in many developing countries. Competition for the use of water in agriculture and hydro-electric power adds to the social opportunity cost of irrigation. The paper focuses on the inequities of farmers' access to existing-gravity (canal) irrigation systems. Guidelines are provided for improving water allocation within an irrigation system. The general theme of the report is that misallocation of water is a serious problem for agricultural development and is based on inadequate local water management institutions.

Brown, Lester

"Vanishing Croplands," Agenda, Vol. 1, No. 11, December 1978, pp. 5-12.

A provocative and graphic description of what has happened and is continuing to happen to the world's cropland. Accelerating soil erosion, the spread of deserts and the loss of cropland to non-farm use is greatly reducing the cropland base. The author points out that there is little verifiable information of what is happening to cropland in the Third World. Overgrazing, overplowing and deforestation use up soils and lead to erosion. "Below that thin layer comprising the delicate organism known as the soil is a planet as lifeless as the moon" (p. 11).

Calavan, Michael M.

"Decisions Against Nature: An Anthropological Study of Agriculture in Northern Thailand," Center for Southeast Asian Studies, Special Report No. 15, 1977, Northern Illinois University, 204 pp.

The central theme of this report is the strategic aspect of adaptation, and that successful adaptation is a process which involves making correct decisions. Attention is given to the crucial decisions involving agricultural activity. In this report the focus is on the patterns of crop production. Chapter 4 of the report contains direct quotations from farmers which reveal certain aspects of their decision-making.

The method is quantitative data gathering and the use of mathematical decision models for the interpretation of human behavior.

Campbell, David J. and James C. Riddell

"Social and Economic Change and the Intensity of Land Use in the Mandara Mountains Region of North Cameroon," accepted for publication in the Journal of Economic and Social Geography, November 1983, 26 pp.

The paper is a discussion of land use patterns in Mandara Mountains. It makes a brief assessment of the viability of those patterns in existing socio-economic and environmental trends. It contrasts land use and land

tenure, and mentions strategies for sustaining resources. It offers an overview to the changes and intensity of land use in the region.

Campos-Lopez, Enrique and Robert J. Anderson (editors)
Natural Resources and Development in Arid Regions, Westview, Special Studies in Natural Resources and Energy Management, 1983, 362 pp.

The book contains papers that were presented at the conference on "Renewable Resources and Regional Development: The Case of the Semi-Arid Zones," held in Cocoyac, Morelos, Mexico, October 1980 (p. x).

The authors' efforts are to integrate various perspectives of resource management, i.e., technical, individual and institutional. Their objective is to present a comprehensive view of aspects relevant to the management of renewable resources.

Chambers, Robert and Jan Moris (editors)
MWEA: An Irrigated Rice Settlement in Kenya, Weltforum Verlag., Munchen Humanities Press. Inc., New York, 1973, 529 pp.

The project started in 1951. The authors describe the MWEA Scheme as one of the most successful irrigation projects. They indicate that it has become an outstanding technical success. The Scheme has used modern technology in a manner that complements labor intensive techniques within the production system. The authors' viewpoint is that the key to MWEA's success has been managerial organization. The project has had the good fortune to have several capable managers (p. 7). Also, it is mentioned that MWEA apparently was a secure investment, with a very favorable physical and social setting.

The authors include a brief account of the Perlsevia Scheme which started at the same time as MWEA, but due to less favorable surrounding conditions has not been successful.

Cusack, David F. (editor)
Agroclimate Information for Development: Reviving the Green Revolution, Westview Press, 1983, 376 pp.

The author briefly explains why the Green Revolution has been unable to do for the world's poor what experts thought it would do. The central theme is that the Green Revolution must be revived and revised in a way which overcomes those factors which have limited its potential. That means, information on climate and weather variation must be taken into account. New food crops developed and traditional native crops revived to be more climate-resistant and genetically adaptable to their specific environment. The author's discussion for agricultural development focuses on the local setting of social, political, infrastructural, cultural and climatic attributes. Technology can play a major role if it is appropriately used. Information systems must be designed to meet the real needs and practical problems of the local people and not the perceived needs or theoretical problems. The author provides a few case studies as examples of how agroclimatic technology is being applied in tropical developing countries; Brazil and Venezuela are two examples.

Dasmann, Raymond F., John P. Milton, Peter H. Freeman
Ecological Principles for Economic Development, John Wiley and Sons Ltd., 1973, 235 pp.

The book discusses ecological and development concepts for the intended use of development specialists and environmentalists. These two groups need to be aware of each others concern and work together when approaching development and conservation problems. The authors indicate that techniques are available to undertake appropriate development, but many projects are not methodically planned to avoid undesirable consequence. The authors provide a physical description of several types of marginal lands and what types of development programs would be appropriate for those areas. They include the development of pastoral lands, humid tropics and a chapter on appropriate tourist development.

Dulby, David, R.J. Harrison Church (editors)

Drought in Africa, Report of the 1973 Symposium, Centre for African Studies, School of Oriental and African Studies, University of London, 124 pp.

The causes, nature and effects of recent drought in Africa and the means for alleviating them were discussed at the Symposium on Drought in Africa (p. 3). Contributing papers more relevant to marginal land included: (1) "The Development of the Water Resources of the Dry Zone of West Africa," by R.J. Harrison Church; (2) "The Practical Importance of Plant Ecology in Arid Zones," by F.N. Nepper; (3) "Meeting the Requirements of Cattle in Drought Conditions," by J.H. Topps; (4) "The Need for Long Term Strategies in Pastoral Nomadism," by Randall Baker; (5) "Extensive Development of the Agricultural Sector in the Semi-Arid and Northern Savanna Zones of West Africa," by Nicholas David; (6) "Some Sociological Factors in the Drought Situation in Africa," by H.A. Fosbrooke; (7) "Drought in Northern Nigeria and the Development of Future Strategy," from the Institute for Agricultural Research, Samaru.

Eckholm, Erik

"Forest for the People," Mazingira, No. 11, 1979, pp. 43-48.

The author explains that forest development must include the involvement of the local community. The requirement is a practical necessity not an ideological goal. He states that if the poor are to benefit from forestry then they must be involved.

Eckholm, Erik

"The Dispossessed of the Earth: Land Reform and Sustainable Development," Worldwatch Paper 30, June 1979, 48 pp.

A brief and insightful essay on how the poor, landless and insecure farm tenants of the world end up with marginal farm plots too small to support a family where their survival most often depends on the weather or the international economy. The chapter, "Land Tenure and Sustainable Development," explains the relationship between ecologically unsustainable farming practices and oppressive landownership.

Eckholm, Erik

Losing Ground: Environmental Stress and World Food Prospects, W.W. Norton and Company, Inc., Worldwatch Institute, 1976, 219 pp.

The author points out self-defeating attempts to increase the supply of food. He provocatively explains how humans are destroying the basis of

their own livelihood and poor people of the world who are the main victims, are being forced by institutional arrangements to degrade their own resources for agricultural production. The book contains a number of case examples that explain and describe these negative ecological trends. The author discusses agricultural systems that are considered backwards but are ecologically sound. In short, development has attempted to mold the environment in a way to fit human needs and aspirations, whereas an ecologically sound system requires human practices to fit the environment as it is. His view is that ecological destruction will lead to social and political upheaval.

Gaitskell, Arthur

Gezira: A Story of Development in Sudan," Colonial and Comparative Studies, edited by Margery Perham, 1959, 368 pp.

Gezira Scheme was an irrigation project in Sudan. Some of the underlying themes of the Gezira Scheme are participation and involvement in decision-making by the users of the resources, adaptability to surrounding resources, and systems approach to land resource use. The statement "the duty of proceeding slowly, of setting nothing on foot that has no real vital connection with the economic needs of the country . . ." (p. 13) illustrates the idea of carefully adapting a country's human and natural resource base to a development. The statement ". . . the core of Gezira success lay in the form of planned agriculture and a policy of control and help associated with it . . . a kind of composed cooperative, eliminated the weakness of an individual striving alone" (p. 278).

Many attributes of the Gezira Scheme may not be appropriate for present day development problems, but its overall approach can serve as an example to draw upon for methods.

Gilbert, E.H., D.W. Norman, F.E. Winch

"Farming Systems Research: A Critical Appraisal," Department of Agricultural Economics, Michigan State University, MSU Rural Development Paper No. 6, 1980.

FSR is a holistic approach to agricultural development. This paper describes and defines various attributes of farming systems research (FSR) and appraises their appropriateness to small farm agriculture. The FSR approach to development starts with the human elements, specifically the farm family, and its position and impact on farming systems. The technical element is given equal consideration, from the standpoint of how it complements or supplements the human resource.

The report discusses institutional linkages to FSR, integration of FSR into projects and monitoring and evaluation of FSR. It examines the methodological issues involved with FSR. The paper discusses several international and national institutes with some focus on FSR.

Glanty, Michael H. (editor)

Desertification: Environmental Degradation in and Around Arid Lands, Westview Press, 1977, 337 pp.

A comprehensive analysis of the causes of the desertification process. The book contains a series of excellent articles. Much

attention is given to ecological deterioration and evaluation of adverse changes in the climate and weather that result in desertification. Articles focus on population movement and the change in human activities which occur as a result of desertification. There are discussions on the problems with reclaiming desert land and strategies against desertification and famine through improved land management. Experience from Somalia and the USSR are included in the report.

Gonzalez, Nancie L. (editor)

Social and Technological Management in Dry: Past and Present, Indigenous and Imposed, AAAS Selected Symposiums, Westview Press, 1978, 199 pp.

The book provides a wide variety of useful examples of successes and failures of indigenous systems to manage marginal lands. Several of the contributions point out that intrusion of Western values has brought about ecological disaster for indigenous groups. The editor's own experience includes field research in the valley of Cibao in the Dominican Republic. It is an example of an irrigation project of the last decade of the 19th century that was dominated by a class of merchants who turned to agrobusiness. The irrigation system that did not provide adequate drainage, resulting in land degradation. The indians before had practiced successful intensive agriculture.

Goodland, R.J.A. and H.S. Irwin

Amazon Jungle: Green Hell to Red Desert?, Elsevier Scientific Publishing Company, Amsterdam, 1975, 141 pp.

The general purpose of the book is to make people aware of the irreparable destruction of the Amazon rain forest by the highway construction program in the Amazon basin. The chapter on deforestation and agriculture is useful description of what happens to lands in fragile tropical ecosystems. In this chapter the authors recommend alternative agriculture techniques and methods that should be implemented in order to develop agro-ecosystems that will also save the Amazon.

Harwood, Richard R.

Small Farm Development: Understanding and Improving Farming Systems in the Humid Tropics, Westview Press, Boulder, Colorado, 1979, 154 pp.

The author's central theme is the analysis of small farm systems which increase efficiency when production resources are limited. The author suggests an integration of traditional and modern technologies in order to enhance agricultural development. New research needs to be based on an understanding of actual farming systems and how they are connected to the social and physical environment. The author calls for collaboration between agricultural developers and farmers.

Higgs, John

"Strategies for Improving Small Farmer Development in the Tropics," Cooperative Extension Service, Miscellaneous Publication 154, University of Hawaii, May 23-26, 1977.

A discussion paper presented by John Higgs directed to the development of a methodology to reach the small, subsistence farmer in the

tropics. Response and comments to the paper were given by Heliodoro Diaz Cisneros, Apichai Karoonyaranich, A.U. Patel, Kenneth H. Parsons, and R.W. Rosbelley. Emphasis was on developing outreach strategies for the small farmer. Diaz's development considerations were ecological conditions, resources available to the subsistent farmer and relevant aspects of traditional technology.

Iltis, Hugh H., Orie L. Loucks, Peter Andrews

"Criteria for an Optimum Human Environment," Bulletin of the Atomic Scientists, Social and Public Affairs, Vol. 26, No. 1, January 1970, pp. 2-6.

A brief discussion outlining a series of studies that would focus on an environmental optimum for people. His major concern is an ethical one in the use of technology and resources.

Jaffee, Steven

"The Opportunities for Development in Less Favorable Areas and Remote Regions," AID Bureau of Science and Technology, Regional and Rural Development, Office of Multisectoral Development, Working Paper, 1983, 18 pp.

The report provides a brief statement of development related problems, e.g., environmental degradation, political-economic complaints, population pressure, human capital, resource base, etc. The report briefly states some of the conditions and characteristics of marginal areas, and possible components of a development strategy. It points out some of the possible costs and benefits and many of the questions related to development of marginal lands.

James, Jeffrey

"Growth, Technology and the Environment in Less Developed Countries: A Survey," World Development, Vol. 6, July/August 1978, pp. 937-965.

The survey attempts to explain the interrelationships between growth, technology and the environmental aspects of economic development in LDCs. It points out that growth and preservation need not be mutually exclusive. The author briefly describes several ecological disasters as a result of inappropriate and poorly planned projects. He discusses the development experiences of the Soviet Union and China, and how they differ.

Johnston, Bruce F. and William C. Clark

Redesigning Rural Development: A Strategic Perspective, The Johns Hopkins University Press, 1982, 297 pp.

The work presents a policy analysis of rural development in LDCs for a strategic perspective. The authors focus on specific interventions in three areas: (1) production-oriented interventions that deal with rural employment opportunities and agricultural development; (2) organization-oriented interventions that deal with institutional structures and managerial procedures; and (3) consumption-oriented interventions that focus on health, nutrition, and family planning. The emphasis of the authors is the design of rural development for long-term consequences of

policies and individual programs. Immediate objectives and action are important, but must be considered in the manner that they fit into long-term goals. The authors attempt to explain why the development community has failed to learn from experience. They emphasize an integrated approach to development and an adaptive policy which is consistent with adapting to the physical environment. The following statement sums up this view: "Good policy analysis, as opposed to good intentions, consists in learning to understand the constraints of power--be it man's or nature's--and in learning to shape feasible programs within the limits they impose" (page 13).

Kassas, M., V.A. Kovda, P.W. Richards, L.J. Mostertman

"Overviews of Four Priority Areas in the United Nation's Environment Program," Agro-Ecosystems (an international journal sponsored by the International Association for Ecology), Vol. 3, No. 3, June 1977, pp. 185-251, Special Issue, Amsterdam.

This special issue provides a concise description of some of the varied aspects of marginal land use. It points out important problems related to the use of marginal lands for agriculture. The issue contains four main articles: (1) "Arid and Semi-Arid Lands: Problems and Prospects," by M. Kassas (Giza, Egypt). The article gives a survey of the world's deserts and the process of desertification. It identifies the processes that are due to physical factors and those that are anthropologist. The author identifies areas of needed study.

(2) "Soil Loss: An Overview," by V.A. Kovda (Moscow, USSR). The article provides an estimation of the earth's soils and describes the major causes of soil degradation. The author gives a guideline for efforts to solve the problem of soil loss.

(3) "Tropical Forests and Woodlands: An Overview," by P.W. Richards (Great Britain). A discussion of the transformation of tropical forests. Significance of these forests to the human environment is reviewed. Provides an outline of current forest research activities and an evaluation of action to stop tropical forest destruction.

(4) "Water Quality: An Overview," by L.J. Mostertman (The Netherlands). The author describes the world's water resources and the relationship to human needs, pollution, salinity and alkalinity, organic waste treatment, need for a systems approach, etc.

Kaul, R.N. (editor)

Afforestation in Arid Zones, Dr. W. Junk N.V. Publishers, The Hague, 1970, 414 pp.

The book is a compilation of the results of research on afforestation in arid zones of many regions of the world. It provides a brief physical and geological description of the region, objectives of afforestation, kinds of trees used. The authors discuss the techniques and results of afforestation and further research needs. For some regions a discussion of the economic and social objectives and land use patterns is offered.

King, K.F.S. (Kenya)

"Agroforestry and the Utilization of Fragile Ecosystems," Forest Ecology and Management (an international journal), Vol. 2, No. 3, November 1979, Elsevier Scientific Publishing Company, Netherlands, pp. 161-168.

The author explains the need for a system that will combine good land management of fragile marginal lands with food production for an increasing number of people who depend on these lands for survival. Agroforestry is the system that can provide food, wood, and preserve the ecosystem.

Klee, Gary A. (editor)

World Systems of Traditional Resource Management, V.H. Winston and Sons, 1980, 286 pp., John Wiley and Sons, New York: Halsted Press.

The book provides a survey of resource management for several regions of the world. The discussion of each region is divided into five sections: (1) the resource base and resource users; (2) the evolution of a tradition-conservation practice and their effectiveness; (3) the existing traditional resource-using systems and their effectiveness for conservation; (4) the region in transition: what elements of cultural change support traditional systems of resource management; and (5) regional assessment: what methods are available for conscious resource preservation from attitudes, technologies, etc.

Kunstadter, Peter, E.C. Chapman, Sanga Sabhasri (editors)

Farmers in the Forest: Economic Development and Marginal Agriculture in Northern Thailand, East-West Population Institute, The University Press of Hawaii, Honolulu, for the East-West Center, 1978, 392 pp.

Environmental degradation associated with marginal land use for agriculture is common in tropical lands. The authors' objective is to provide detailed accounts of shifting cultivation, or swidden agriculture, and the implications it has for the future of the people and environment of Thailand.

The authors attempt to integrate social and ecological aspects of this land use system of swidden agriculture from the perspective of soil, agriculture, and forestry science, law, administrative and from forest farmers themselves. They examine four areas of social and economic problems: sustained population growth, socio-economic inequalities of the marginal agricultural areas, low productivity per unit area of swidden cultivation, and the problems of conserving soil, watershed and forest resources.

MAB Technical Notes

The Sahel: Ecological Approaches to Land Use, the UNESCO Press, Paris, 1975, 99 pp.

The purpose of the report is the development of the Sahel. A brief climatic and pedologic description of the Sahel is provided. Remote sensing techniques are suggested for doing ecological research. A good description of plant cover and pasture and livestock is provided. Some proposals are mentioned that would follow an adaptive approach to management of the Sahel.

Mahbutt, J.A. and C. Floret (editors)

Case Studies on Desertification, UNESCO, 1980, 279 pp.

The report includes studies on desertification from the governments of Tunisia, Chile, Niger, India, Iraq, Pakistan and an association of other various countries. Certain regions of each participating country are studied.

Murray, Gerald

"Land Tenure, Land Insecurity and Planned Agricultural Development Among Haitian Peasants," August 25, 1978, unpublished, 53 pp.

Description of different land tenure arrangements in Haiti, e.g., inheritance plots cropped by siblings on a rotation basis, inheritance plots used in common, etc. Includes pattern of land transaction. Intra class value of most land sales.

Women inherit land equally with males, however research suggests that they are excluded from full exercise of land rights.

State land, as a source of public revenue, may be held, sold or rented. Other ownership of land includes hidden deeds, master's deeds. The report is a descriptive overview of certain types of land tenure dynamics in rural Haiti. Land tenure considerations influence an erosion control and irrigation project.

Myers, Norman

"The Exhausted Earth," Foreign Policy, No. 42, Spring 1981, pp. 141-155.

A discussion on how the species of the earth serve the welfare of humankind. These species supply a range of goods from rubber to germ plasm, and through techniques of bioengineering new products for agriculture, medicine and industry are devised. "Extinction of species constitute an irreversible loss of a unique natural resource" (p. 143). North-South relations need to address the issue of preserving the species resource in the development process in order to benefit both the developed and less developed countries. Some suggestions are made by the author that would preserve the species resources.

Myers, Norman

The Sinking Ark: A New Look at the Problem of Disappearing Species, Pergamon Press, 1979, 302 pp.

The book centers around the problem of species extinction, but does not advocate the conservation of species as an overriding objective. The author's purpose is to enhance the long-term human welfare in all ways. His discussion is that the consumer-oriented behavior of the most industrialized countries is detrimental to life on earth. The author suggests that our children will live in a world made poorer through the elimination of the myriad of life form. Descriptions of the exploitation trends of tropical moist forests for several countries is provided. The author gives examples and discusses ways to reduce excessive exploitation. He describes the roles that developing and developed countries and international aid agencies can pursue to stop the impoverization of the earth. For example, he suggests that all countries, especially tropical regions, set aside representative examples of their ecosystems. The book provides a well-balanced approach to economic and social development.

Netting, Robert

Hill Farmers of Nigeria: Cultural Ecology of the Kofyar of the Jos Plateau, University of Washington Press, 1968, 246 pp.

A case study of the subsistence adaptation of the Kofyar and analysis of their cultural ecology. The author explains the functional relationship between resources, technology and cultural features in an agricultural society.

Netting, Robert M., Stephen B. Brush, Donald A. Messerschmidt

"Cultural Adaptations to Mountain Ecosystems," a symposium given at the Annual Meeting of the American Anthropological Association, New Orleans, Louisiana, November 28, 1973, in Human Ecology, Vol. 4, No. 2, April 1976, pp. 125-185.

Three major discussions are presented: (1) "What Alpine Peasants Have in Common: Observation on Communal tenure in a Swiss Village," by Robert M. Netting. This article concerns the ecological approach to the persistence of communal tenure in a Swiss village. Adaptive value of group holdings is compared to that of individual rights.

(2) "Man's Use of an Andean Ecosystem," by Stephen B. Brush. The article discusses the natural and crop zonation in one valley of the Andes in Peru. It describes land use patterns of a community and compares that valley system with others on the eastern slopes.

(3) "Ecological Change and Adaptation Among the Gurungs of the Nepal Himalaya," by Donald A. Messerschmidt. A study of shepherding among the highland Gurungs of Nepal. The discussions focus on early high-altitude ecological adaptations and later shifts to lower-altitude ecological zones. Also, a present day village is described, explaining cultural adaptations and economic strategies. Comparisons are made to villages of other regions.

Nickum, James E.

"Irrigation Management in China: A Review of the Literature," World Bank Staff Working Papers, No. 545, 1982, 106 pp.

The report's purpose is to provide an outside view of China's water management. The paper focuses on major issues, such as institutional management, organizational structure including staffing, water fees and funding, and water allocation and conjunctive use of multiple source. Mentioned are the case studies that provide the primary data base.

O'Keefe, Phil and Ben Wisner (editors)

Land Use and Development, African Environment Special Report 5, International African Institute, 1979, 232 pp.

The book's focus is on the constraints of development in rural Africa, i.e., economic, ecological, political. The article discusses the husbandry of tropical forests and soils, forest influence on environment stability and vegetation and environmental change. Included is a case study of the scheme at Khashm el Girbu which attempted to settle nomads. Other case examples are included in the description of development constraints.

Parsons, James J.

"Forest to Pasture: Development or Destruction?" Revista de Biologia Tropical, Vol. 24 (Supplement 1), 1978, pp. 121-138.

The author's discussion is development strategies need to focus on the allocation of resources towards a long-term benefit; that commercial export crops must be replaced by a self-sustaining agro-ecosystem. He states that the conversion of forest to pasture is a loss of wealth and requires high-cost inputs in order to sustain productivity.

Posner, Joshua L. and Malcolm F. McPherson

"Agriculture on the Steep Slopes of Tropical America: Current Situation and Prospects for the Year 2000," World Development, Vol. 10, No. 5, pp. 341-353, 1982.

Three main questions are discussed in the article: (1) what is the contribution to national agricultural output of the steep slopes of Tropical America; (2) what is the economic status of the people who live there; and (3) what are the prospects for the area in the year 2000 (p. 341).

The authors point out diverse opinions on farming steep slopes: some emphasize the ecological fragility of the slopes, and that there is severe erosion that is increasing, and others say that the traditional systems of resource use are adaptive. The authors argue that there is a lack of reliable data. Their work shows that steep slopes make a large contribution to agricultural production and that environmental degradation is not widespread but confined to specific areas where the physical resource base has been pushed beyond its sustainable productive capacity. Farmers have adapted to hill farming with supplemental income from off-farm activities.

Prat, D.J. and M.D. Gwynne (editors)

Rangeland Management and Ecology in East Africa, London, Hodder and Stoughton, 1977, 303 pp.

The book provides a survey of the range environment of East Africa. The range is a basic resource that combined with an understanding of the ecosystem can provide increased utilization and development. Thus, the authors provide guidelines for proper use of the rangeland. Water development, plant growth and utilization and bush control are discussed. They discuss group ranches and marketing.

Ruthenberg, Hans

Farming Systems in the Tropics, Oxford University Press, Second Edition, 1976, 356 pp.

Farm-system approaches are relevant to agricultural development policies which require information about the existing farming situations. The farm as a system consists of sub-systems which form a hierarchy of systems (p. 3). Farm systems typically change the natural systems which are considered unproductive. When an artificial farming system is not or cannot be maintained, it usually declines towards a lower level state than the original natural one. The author classifies different farming systems

and describes general characteristics of tropical farming. He provides examples of the different systems in different countries. Some systems discussed are fallow, ley, arable irrigation, shifting cultivation, grazing, perennial crops and continuous expansion of cultivation.

Ruthenberg, Hans (editor)

Smallholder Farming and Smallholder Development in Tanzania: Ten Case Studies, Munchen: Weltforum Verlag., 1968, 360 pp.

Theories and policies relating to agricultural development should be based on empirical research (p. 11). The report is a summary of ten case studies carried out in Tanzania that deal with farming systems. The emphasis is on the interaction between technical, economic and social attributes of farming. Two studies are "Permanent Farming on Ukara: The Impact of Land Shortage on Husbandry Practice," by N.D. Ludwig (p. 87) and "Coffee-Banana Farms at Mt. Kilimanjaro: The Evolution of an Integrated Farming System," by H. Ruthenberg (p. 213).

Shaner, W.W., P.E. Philipp, W.R. Schmehl

Farming Systems Research and Development, (FSR&D), A Consortium for International Development Study, Guidelines for Developing Countries, Westview Press, Boulder, Colorado, 1982, 405 pp.

FSR&D looks at farming as a system. It looks at the interaction of different components of the whole farm setting and measures the results of the interaction in terms of farmers' and society's goals.

The authors present the FSR&D activities, methods and illustrations of various approaches with an appendix to further describe those points.

The FSR&D approach concentrates on field activities and the close interaction of on-farm activities that are characteristic of subsistence farming. Its purpose is to develop greater insight into which technologies fit where and why. The idea is to adapt the farm family and production method in a manner that will build upon the existing local resource base. The authors state that the book was intended to serve as a general guideline especially for those in developing countries. Illustrations are provided to see how some of the principles have been applied to specific situations.

Shapiro, Kenneth (Project Director)

Science and Technology for Managing Fragile Environments in Developing Nations, Office of International Studies, School of Natural Resources, University of Michigan, September 1978, 378 pp. and appendix.

The volume provides the reader with a comprehensive analysis of fragile environments in LDCs from a technical perspective. The work is based on five study papers emphasizing different aspects of fragile regions in LDCs. They include: (1) ecological characteristics; (2) production systems; (3) remote sensing; (4) institutions for planning and management; and (5) community level change strategies (page 1). The study gives a description of what constitutes fragile environments and the need for care in their use. The book includes case descriptions of programs in different countries that attempt to address the problem of fragile land management. In short, it looks at problems and possible solutions from the view of seeking to better adapt science and technology to the cultural requirements of the local and regional populations.

Steinberg, David I.

"Irrigation and AID's Experience: A Consideration Based on Evaluations,"
AID Program Evaluation Report No. 8, August 1983, 237 pp.

The study is based on earlier AID investments in irrigation projects. The central theme of the report is the evaluation of the impact of those projects. Four main problems of irrigation projects are looked at: (1) policy questions, i.e., the requisite of a national resource policy; (2) overly optimistic assumption about the immediate effects of irrigation; (3) the technological choice in design of irrigation; and (4) issues of institutional administration and water management.

The purpose of the study is to determine if there are common causes of irrigation problems that can be identified and corrected which will help to improve project design. The paper attempts to ascertain what constitutes effective water management. It examines farm, community and agency based systems and evaluates projects in a country by country basis.

Stevens, Robert D. (editor)

Tradition and Dynamics in Small-Farm Agriculture: Economic Studies in Asia, Africa, and Latin America, The Iowa State University Press, Ames, Iowa, 1977, 255 pp.

The author's intent is to describe the decisions made by small farmers, i.e., technical, economic, familial. More specifically, examples of development strategies that have led to increased production and employment on small farms are provided.

Part 3, The Dynamics of Small-Farm Agriculture, describes three case studies (Pakistan, Venezuela and Mexico) and attempts to explain the difficulties, successes and in general, the interaction of factors affecting a development effort.

Tustin, J.R., R.L. Knowles, K.K. Klomp (New Zealand)

"Forest Farming: A Multiple Land Use Production System in New Zealand,"
Forest Ecology and Management (an international journal), Vol. 2, No. 3,
November 1979, Elsevier Scientific Publishing Company, Netherlands,
pp. 169-189.

The authors explain how forest farming practices in New Zealand can merge livestock farming and forestry into a two-tier production system. The concept has been shown to be technically feasible, and suitable to hill-country farms with higher financial returns.

USDA

"Planning for a Permanent Agriculture," Miscellaneous Publication 351,
including a summary of the programs administered by the Department of
Agriculture that influence the use of the land, June 1939, 71 pp.

This brief report provides an example of the plans and policies that the U.S. had developed toward land use and agricultural development. The value of the report is not so much the specific programs or problems that were outlined as it is the approach and underlying purpose of the programs. The document illustrates an adaptive and cooperative basis to resource utilization and the interaction with agricultural and community development. The report provides a framework for how to think about marginal land use.

United States Congress

Background papers for Innovative Biological Technologies for Lesser Developed Countries, an Office of Technology Assessment Workshop, November 24-25, 1980. Report prepared for the Committee on Foreign Affairs, U.S. House of Representatives 97th Congress, First Session, September 1981.

The report consists of ten papers covering a broad range of innovative technologies for LDCs. The overall approach of the report is towards developing sustainable, productive agro-ecosystems; an integrated agriculture suitable for tropical conditions. The reports discuss technologies such as native plants that are integrated into cropping systems that will reduce the need for fertilizers and water, and enhance resistance to pests and disease; developing multiple-cropping and inter-cropping systems; integrated agricultural systems that take advantage of nitrogen-fixing trees that could be used to revegetate deforested landscapes, while providing food, fodder, fuelwood, increased soil flexibility, etc. The discussions, in general, consider the restrictions of social, economic, political and others that are associated with LDCs.

United States Congress

"Sustaining Tropical Forest Resources: Reforestation of Degraded Lands," Congress of the United States, Office of Technology Assessment, Background Paper No. 1, May 1983, 55 pp.

The paper provides an overview of some reforestation technologies and their possible benefits or costs. It discusses constraints and opportunities of the technologies. It provides a good reference list on agroforestry.

United States Congress

"Sustaining Tropical Forest Resources: U.S. and International Institutions," Congress of the United States, Office of Technology Assessment, Background Paper No. 2, May 1983, 65 pp.

The paper explains how U.S. and international institutions affect the development and implementation of technologies to sustain tropical forest resources (p. iii). The report provides an overview of important institutions and points out some of the constraints and opportunities of these institutions. Short reference list.

United States Congress

"Water-Related Technologies for Sustainable Agriculture in Arid/Semi-Arid Land: Selected Foreign Experience," Background Paper, Congress of the United States, Office of Technology Assessment, May 1983, 82 pp.

The paper's purpose is to focus on foreign and cooperative examples of what other countries are doing to manage agriculture in arid and semi-arid environments. Some of the countries and examples that are noted are: managing water on farms in Pakistan; Israel's water policy as a national commitment; breeding beans and cowpeas for drought resistance and heat tolerance in Guatemala, Mexico and Senegal. It is intended to be used more for U.S. water policies and programs. It provides some brief examples of successful programs in other countries that may be helpful. Contains a list of contacts.

United States Congress

"Water-Related Technologies for Sustainable Agriculture in U.S. Arid/Semi-Arid Lands," Congress of the United States, Office of Technology Assessment, October 1983, 412 pp.

Although this report was done for U.S. agriculture, some of its major findings have relevancy to other countries; such as (1) in order to maintain sustainable agriculture in the arid U.S., a systems approach to decision-making regarding policies, plans and programs that affect the agricultural resource base and water-related technologies is a fundamental need; (2) the goal of sustaining long-term productivity of the resource base is not being advanced; (3) to ensure a sustainable agriculture in and on marginal regions, the users of the land must perceive equity and fairness in decision-making about needed technologies and conflict resolution (p. 5).

The underlying theme in this report is the need to develop a land use policy for arid/semi-arid lands that will ensure and sustain long-term productivity. With that in mind, the report assesses existing and emerging water-related technologies.

Vermer, Donald E.

"Collision of Climate, Cattle and Culture in Mauritania During the 1970s," The Geographical Review, Vol. 71, 1981, pp. 281-297.

The author provides a brief description of the climate, cattle and culture of west-central Mauritania. It is an area of Mauritania that is most intensively used by migratory herdsman. The author explains the three factors combined in the 1970s to create disaster. Provides some historical discussion of drought cycles and prescribes that plans must be developed for the area which envisions future drought situations.

West Virginia University

Hill Lands: Proceedings of an International Symposium, West Virginia University, October 3-9, 1976, 770 pp.

The volume consists of 137 articles that emphasize the agricultural potential of hill country and mountain environments in contributing to the world's food needs. Certain discussions focus on hill ecosystems and the use of the areas for purposes other than agriculture. The purpose of those discussions was the impact on cultural relationships among mountain communities that would affect the reclamation of fragile and marginal lands.

Wilken, Gene C.

"Microclimate Management by Traditional Farmers," The Geographical Review, Vol. 62, 1972, pp. 544-560.

The article provides a review of the common methods that traditional farmers use to alter the microclimates affecting their crops. Irrigation and drainage are not included. Some aspects which are included: shade management, different tillage systems, surface mulches (including rock mulches), induced dew formation, windbreaks, and others. The microclimate of small plots or single planting is considered manageable whereas large areas are not.

Wilken, Gene C.

"Integrating Forest and Small-Scale Farm Systems in Middle America," Agro-Ecosystems, Vol. 3, No. 4, September 1977, pp. 291-302.

A discussion on adapting small-scale farming techniques in forested areas of Central America. An explanation that deforestation and open fields are not self-sufficient or stable. That situation leads to increased soil loss, disease, nutrient depletion, etc. The article points out several systems where forests provide a valued source of inputs to small-scale farming.

Wilkinson, J.C.

"Problems of Oasis Development," School of Geography, University of Oxford Research Paper No. 20, October 1978, 40 pp.

The author states that the breakdown of traditional organization has caused the collapse of the old culture on which desert life was based (p. 3). His argument is that regeneration of desert life cannot happen by simply adding more water for agriculture, it must happen by reversing the processes which led to decay.

The author's discussion includes the ill-effect of urbanization on oases, inappropriate mechanization and government policy. He points out that planning must take into account the particular attributes and needs of each settlement and its relationship to the whole national pattern of agricultural production and distribution.

Wionczek, Miguel S., Gerald Foley, Ariane Van Burean (Coordinadores)

"La energia en la transicion del sector agricola de subsistencia," El Colegio de Mexico, 1983, 222 pp.

The authors discuss the demand and various types of energy sources and supply in the agricultural sectors of poor countries. They describe a number of characteristic uses of energy, different energy supplies, limitations, energy technologies, etc., that make up the agricultural sector. This established description serves as a framework to analyze on a case by case basis several countries and their energy resources and use. Different energy technologies are evaluated and their relevance to agricultural production, farming traditions, economic factors affecting energy supply, political considerations, etc. They discuss strategies to adapt energy supply and use to local agricultural methods.