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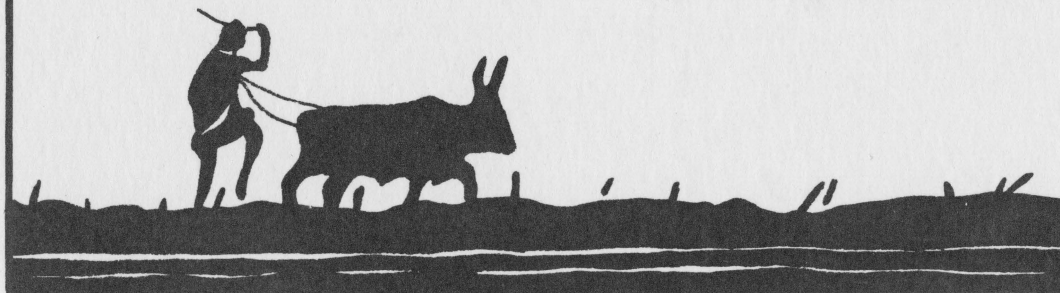
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A FARMING SYSTEMS RESEARCH  
BIBLIOGRAPHY OF KANSAS STATE  
UNIVERSITY'S VERTICAL FILE MATERIALS:  
1990 SUPPLEMENT

Tod L. Meyn and Nancy Donoghue  
Compilers and Editors

Paper No. 4S2  
(Supplement Two to the Revised Edition)  
Fall 1990

FARMING SYSTEMS RESEARCH  
PAPER SERIES



RESOURCES ON DEVELOPING COUNTRIES

KANSAS STATE UNIVERSITY  
MANHATTAN, KANSAS 66506 U.S.A.

A FARMING SYSTEMS RESEARCH  
BIBLIOGRAPHY OF KANSAS STATE  
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USA

## **FARMING SYSTEMS RESEARCH PAPER SERIES**

Kansas State University's Farming Systems Research (FSR) Paper Series is supported by the U.S. Agency for International Development Title XII Program Support Grant. The goal of the Program Support Grant is to increase the University's ability to implement Title XII agricultural and nutritional development assistance programs in developing countries. This paper series is maintained by the FSR Program Associates -- a multidisciplinary team of professors who are aiming their activities at applied research on farming from a systems perspective.

The purpose of the FSR Paper Series is to disseminate information on FSR. Publication categories include updated bibliographies from KSU's FSR data base; proceedings from KSU's FSR Systems Symposium; selected papers presented in KSU's FSR Seminar Series; and selected papers prepared by KSU's Program Associates.

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Vernon C. Larson  
Director  
International Agricultural Programs

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The Technical Advisory Committee's Review Team of Farming Systems Research has defined a farming system as:

"a complicated, interwoven mesh of soils, plants, animals, implements, workers, other inputs and environmental influences with the strands held and manipulated by a person called the farmer who, given his [or her] preferences and aspirations, attempts to produce output from the inputs and technology available to him [or her]. It is the farmer's unique understanding of his immediate environment, both natural and socio-economic, that results in his [or her] farming system."

It goes on to describe FSR as:

"research (including training) which: (1) is conducted with a recognition of and focusing towards the interdependencies and inter-relationships that exist among elements of the farm system, and between these elements and the farm environment; and (2) is aimed at enhancing the efficacy of farming systems through the better focusing of agricultural research so as to facilitate the generation and testing of improved technology.

"The major activities involved in FSR are:

- (a) The collection and analysis of base data;
- (b) The study of existing farming systems;
- (c) The design of new farming systems;
- (d) Farm systems experimentation; and
- (e) The evaluation and monitoring of new farming systems."<sup>1</sup>

## THE SUPPLEMENT . . .

is the result of the KSU Farming Systems Research Program's ongoing documentation effort, and lists FSR vertical file material and selected publications with Library of Congress classification numbers found within KSU's Farrell Library. A complete listing of FSR documents at KSU cited prior to this supplement can be found in the following two previously issued bibliographies:

Graham, Gretchen A., ed. A Farming Systems Research Bibliography of Kansas State University's Vertical File Materials (Revised). Farming Systems Research Paper Series no. 4. Manhattan, Kan.: Resources on Developing Countries, Farrell Library, Kansas State University. 1986.

Young, Noel D. and Elsa Eaton, eds. A Farming Systems Research Bibliography of Kansas State University's Vertical File Materials: Some Selections from the Peter E. Hildebrand Collection, Part One. Farming Systems Research Paper Series no. 4S1 (supplement 1 to the rev. ed.). Manhattan, Kan.: Resources on Developing Countries, Farrell Library, Kansas State University. 1988.

Two other bibliographies in the FSR Paper Series are:

Young, Noel D. and Tod L. Meyn, comps. and eds. Women in Development: Selections from Kansas State University's Vertical File Materials. Farming Systems Research Paper Series no. 21. Manhattan, Kan.: Resources on Developing Countries, Farrell Library, Kansas State University. 1989.

Young, Noel D. and Tod L. Meyn, comps. and eds. Botswana and Bechuanaland Items Held in Farrell Library: A Compendium of Books, Documents, Reports, Journal Articles, and Fugitive Literature, Part One. Farming Systems Research Paper Series no. 20. Manhattan, Kan.: Resources on Developing Countries, Farrell Library, Kansas State University. 1989.

The vertical file material includes unpublished papers, drafts, house organs and other non-conventional items. Keyword, title and primary author indices are provided. The standard for keywording is an "enhanced" CAB Thesaurus. Those items marked with a "++" in the location code have not yet been assigned a Library of Congress classification number.

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We welcome suggestions and donations of new materials for the Farming Systems Collection.

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accession number	title	place of publication	publisher	citation to larger work
2812	FOOD CONSUMPTION SURVEY IN GUIDIMAKA, GORGOL, BRAKNA AND TRARZA REGIONS.	IN: <u>Farming Systems Research Along the Senegal River Valley</u>	Frankenberger, T.R. (1986) Tucson, Ariz.: Univ. of Arizona, College of Agriculture.	(Mauritania Agricultural Research Project II; Report No.3, Apr. 1986) 105p.
	<u>KEYWORDS:</u> Africa, West Africa, Mauritania, semiarid zones, surveys, food consumption, food preferences, food preparation, food prices, food storage, food distribution, wild plants, diseases, women, gardens, food shortages, seasonality			
	keywords			location code
				MR.3.D

## ABBREVIATIONS, ACRONYMS, AND INITIALISMS

AAAS	American Association for the Advancement of Science
AABGA	American Association of Botanical Gardens and Arboreta
ACDI	Agricultural Cooperative Development International
ACIAR	Australian Centre for International Agricultural Research
AD	Agricultural Administration
ADB	Asian Development Bank
ADC	Agricultural Development Council
ADNP	Agricultural Development Ngamiland Project
AFTRCW/UNEC	African Training and Research Centre for Women/United Nations Economic Commission for Africa
AHS	American Horticulture Society
AIA	Agricultor-Investigacion-Agricultor
AICRPDA	?
AID/S&T	Agency for International Development/Bureau for Science and Technology
AID	Agency for International Development
ALDEP	Arable Lands Development Program
APCWD	Asian and Pacific Centre for Women and Development (Bangkok, Thailand)
ASA	American Society of Agronomy
ASAE	American Society of Agricultural Engineers
ASPAC/FFT	Food and Fertilizer Technology Center of the Asian and Pacific Region
ASTA	American Seed Trade Association
ATIP	Agricultural Technology Improvement Project (Botswana)
AVRDC	Asian Vegetable Research and Development Center
BAEP	Bureau of Economic Analysis and Planning
BARC	Bangladesh Agricultural Research Council
BIFAD	Board for International Food and Agricultural Development
BDPA	Bureau pour le developpement de la production agricole
c	copyright
C.I.A.T.	Centro de Investigacion Agricola Tropical (Bolivia)
CAEP	Caribbean Agricultural Extension Project
CARDI	Caribbean Agricultural Research and Development Institute (U. of the West Indies)
CATIE	Centro Agronomico Tropical de Investigacion y Ensenanza
CATIE/ROCAP	Centro Agronomico Tropical de Investigacion y Ensenanza/Regional Office for Central American Programs
CDR	Centre for Development Research
CENDA	Centro de Desarrollo Agropecuario (Zona Norte)

CENDERCO	Centro para el Desarrollo Rural y Cooperativo
CENDHRRRA	? (San Juan, Rizal, Philippines)
CENTA/BID	Centro Nacional de Tecnologia Agropecuaria/? (El Salvador)
CENTA	Centro Nacional de Tecnologia Agropecuaria
CEPAL	Economic Commision for Latin America (Santiago, Chile)
CES	Cooperative Extension Service (U.S.)
CGIAR	Consultative Group on International Agricultural Research
CIAR	Centro Internacional de Agricultura Tropical
CIARLA	Centro de Investigaciones Agropecuarias Region Los Andes
CIAT	Centro Internacional de Agricultura Tropical
CID	Consortium for International Development
CIDA	Canadian International Development Agency
CILSS	Comite permanent interetat du lutte contre le secheresse dans le Sahel- Permanent Interstate Committee for Drought Control in the Sahel)
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo
CIP	Centro Internacional de la Papa
CIPEA	Centre international pour l'elevage en Afrique
CLADES	Latin American Centre for Economic and Social Documentation
CLSR	Crop-Livestock Systems Research
CLSU	Central Luzon State University
comp., comps.	compiler, compilers
CRDI	Centre de recherche pour le developpementinternational
CRIA	Central Research Institute for Agriculture (Indonesia)
CRIFC	Central Research Institute for Food Crops
CRSP	Collaborative Research Support Program
DAI	Development Alternatives, Inc.
Dept.	Department
DESFIL	Development Strategies for Fragile Lands
ed., eds.	editor, editors
EFSaip	Evaluation of Farming Systems & Agricultural Implements Project (Sebele, Botswana)
EMBRAPA	Empressa Brasileira de Pesquina Agropecuaria
et al.	(used when there are more than 3 authors)
FAO	Food and Agriculture Organization of the United Nations
FAO/SID	Food and Agriculture Organization of the United Nations/Swedish International Development Agency
FONAIAP	F o n d o   N a c i o n a l   d e   I n v e s t i g a c i o n e s Agropecuarias(?)/Development(?)(Project)
FSDP-EV	Farming Systems Development Project - Eastern Visayas (Philippines)
FSIP	Farming Systems Improvement Project (Rwanda)
FSR	farming systems research
FSR/E	Farming Systems Research/Extension
FSR/D	Farming Systems Research/Development



FSSP	Farming Systems Support Project (University of Florida, Gainesville)
FSSP/GARD	Farming Systems Support Project (University of Florida, Gainesville)/Gambia Agricultural Research and Diversification (?)
FSSR	Farming Systems Southern Region
FY	fiscal year
GARD	Gambia Agricultural Research and Diversification (?)/Development (?) (Project)
GERDA	Groupeement d'etudes et du recherches pour le developpement de l'agronomie tropical
GIS	geographic information systems
HYVs	high yielding varieties
IAAE	International Association of Agricultural Economists
IADS	International Agricultural Development Service
IAF	Inter-American Foundation
IAFP	International Agricultural and Food Program (Cook College, Rutgers University)
IARCs	International Agricultural Research Centers
IARI	International Agricultural Research Institute
IBPGR	International Board for Plant Genetic Resources
ICA	Instituto Colombiano Agropecuario
ICAR	Indian Council of Agricultural Research
ICARDA	International Center for Agricultural Research in the Dry Areas
ICLARM	International Centre for Living Aquatic Resources Management
ICMRD	International Center for Marine Resource Development
ICRAF	International Center for Research in Agroforestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICRW	International Center for Research on Women
ICTA	Instituto de Ciencia y Tecnologia Agricolas-Institute of Agricultural Science and Technology (Guatemala)
IDIAP	Instituto de Investigaciones Agropecuarias de Panama
IDRC	International Development Research Centre
IDS	Institute for Development Studies
IDS	international development strategy
IDWSSD	International Drinking Water Supply and Sanitation Decade
IE&R, IPIA	International Education and Research, International Programs in Agriculture (Purdue U.)
IFAD	International Fund for Agricultural Development
IFDC/IRA	International Fertilizer Development Center/Institute du recherche agronomique
IFOAM	International Federation of Organic Agricultural Movements
IFPP	Integrated Farming Pilot Project (Pelotshetlha)
IFPRI	International Food Policy Research Institute
IIAP	Instituto de Investigaciones Agropecuarias de Panama

IICA/INR	Inter-American Institute for Cooperation on Agriculture/Institute national de recherches agronomiques
IICA/CIDIA	Inter-American Institute for Cooperation on Agriculture - Instituto Interamericano de Ciencias Agricolas de la Organizacion de Estados Americanos/Centro Interamericano de Documentacion e Informacion Agricola
IITA	International Institute of Tropical Agriculture
ILCA	International Livestock Center for Africa
ILO	International Labour Organisation
INCAP	Instituto de Nutricion de Centroamerica y Panama
INIA	Instituto Nacional de Investigaciones Agrarias
INIAP	Instituto Nacional de Investigacion Agropecuaria
INRA	Institute national de la recherche agricole
INRAN	Institute national de recherches agronomiques des Niger
Inst.	Institute
INSTRAW	International Research and Training Institute for the Advancement of Women
INTERPAKS	International Program for Agricultural Knowledge Systems (U. of Illinois, Urbana-Champaign)
INTSORMIL/CRSP	International Sorghum/Millet/Collaborative Research Support Program
INTSORMIL	International Sorghum/Millet
IPIA	International Programs in Agriculture (Purdue University)
IPM	integrated pest management
IRAEN	International Rice Agro-Economic Network
IRAT	Institute des recherches agronomiques tropicales et des cultures vivrieres
IRCs	International Research Centers
IRCT/Mali	Institut de recherche du coton et des textiles exotiques (Mali)
IRRI	International Rice Research Institute
ISA	Investigacion de Sistemas Agropecuarios
ISAR	Institute for Agricultural Research (Rwanda)
ISNAR	International Service for National Agricultural Research
ISRA	Institut Sénégalais de Recherche Agricole - Senegal Agricultural Research Institute
ISS	Institute of Social Studies
IUFS&T	International Union of Food Science & Technology (Goteborg, Sweden)
IUNS	International Union of Nutritional Sciences (Zurich)
KKU	Khon Kaen University, Thailand
KKU/FCSP	Khon Kaen University/Ford Cropping Systems Project
KSU	Kansas State University (Manhattan, Kansas)
LASA	Lesotho Agricultural Sector Analysis Project
MAFC	Ministry of Agriculture, Food and Consumer Affairs (Barbados)
MARC	Monitoring and Assessment Research Centre
MARIF	Malang Research Institute for Food Crops

MDP	Molapo Development Project (Maun)
MF	microfiche
MIAC	MidAmerica International Agricultural Consortium
MIDAS	Managed Inputs and Delivery of Agricultural Services
MP	miscellaneous papers
MSTT	Modular System for Technology Transference
MSU	Michigan State University (East Lansing, Michigan)
n.d.	no date of publication
NADP	Ngamiland and Agricultural Development Project (Gomare)
NARS	national agricultural research systems
NERAD	Northeast Rainfed Agricultural Development Project (Thailand)
NGA	National Grains Authority (Quezon City, Philippines)
NGO	non-governmental organization
NIEO	new international economic order
NOAA	National Oceanic and Atmospheric Administration
NRDP	National Rural Development Project (Malawi)
NSW/ACT	New South Wales/Australian Capital Territory
OAS	Organization of American States
OAU/STRC	Organization of African Unity/Scientific Technical Research Commission
OAU	Organization of African Unity
ODA	Overseas Development Administration
ODI	Overseas Development Institute
OECD	Organization for Economic Cooperation and Development
OLC	Overseas Liaison Committee (American Council on Education)
ORD	Organisme regional de developpement
ORSTOM	Office de la recherche scientifique et technique outre-mer
PACO	Projet Agricole du Centre-Ouest (Ivory Coast)
PAR	planning-centered approach to research
PARC	Pakistan Agricultura Research Council
PASITA	Program of Advanced Studies in Institution Building and Technical Assistance Methodology
PC	paper copy
PCARR	Philippine Council for Agriculture and Resources Research
PCARRD	Philippine Council for Agriculture and Resource Research and Development
PCCMCA	Programa Cooperativo Centroamericano para el Mejoramiento de Cultivos Alimenticios
PGRCE	Plant Genetic Resource Center for Ethiopia
PN	publication number
PR	progress report
PRC	People's Republic of China
PROTAAL	Proyecto Cooperativo de Investigacion sobre Tecnologia Agropecuaria en America Latina

PSCPA	Proyecto de Sistemas de Cultivo para Pequeños Agricultores y del Istmo Centroamericano
PTPA	Proyecto de Tecnología para Pequeños Agricultores
RD	reporting documents
ROC	Republic of China
ROCAP	Regional Office of Central American Programs
RPO	? (World Bank)/International Finance Corporation
RRFH	regular research field hearings
RTN	Research and Training Network
s.l.	no location of publisher/printer
s.n.	no name of publisher/printer
S&T/AGR/AP	Bureau for Science and Technology/Office of Agriculture/?
SACUC	Swaziland Agricultural College and University Centre
SADCC	Southern African Development Coordination Committee
SADDC	Southern African Development Coordination Committee
SAFGRAD	Semi-Arid Food Grains Research and Development Program
SAREC	Swedish Agency for Research Cooperation with Developing Countries
SAT	semi-arid tropics
SEADAG	Southeast Asian Development Advisory Group
SEARCA	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
SIRDO	Integrated System for Recycling Organic Wastes
SOA	School On-The-Air
SR-CRSP	Small Ruminant-Collaborative Research Support Program (Germany)
SSRC/SERP	Social Science Research Centre/Socio-Economic Research Project
STRC/OAU	Scientific Technical Research Commission/Organization of African Unity
SURIF	Sukamandi Research Institute for Food Crops (Subang, West Java, Indonesia)
T&V	training and visit system
TARO	Tanzania Agricultural Research Organization
TES	typical (Developing Country) extension systems
TFNC	Tanzania Food and Nutrition Centre
TIF	Technological Improvement File
Trans.	translation
U.	University
UN	United Nations
UN/ESCAP	United Nations/Economic and Social Commission for Asia and the Pacific
UNAZA	? (Zaire)
UNDP/FAO	United Nations Development Programme/Food and Agriculture Organization of the United Nations
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNU	United Nations University (Tokyo)
US	United States

USAID	United States Agency for International Development
USDA	United States Department of Agriculture
var.	various (paging)
VITA	Volunteers in Technical Assistance
VLS	village level studies
VLS	village level studies
vol., vols.	volume, volumes
WA	West Africa
WARDA	West Africa Rice Development Association
WHO	World Health Organization
WIADP	Women in Agriculture (Development Project)
WIDRIC	Women and International Development Research and Information Center (U. of Minnesota, Minneapolis, Minnesota)
Winrock	Winrock International Institute for Agricultural Development
WIP	Winrock International publication
WIRFS	Women in Rice Farming Systems
WP	working papers
WSARP	Western Sudan Agricultural Research Project

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# FARMING SYSTEMS RESEARCH BIBLIOGRAPHY: 1990 SUPPLEMENT

## 1 FARMING SYSTEMS: DESCRIPTIVE (GENERAL AND INCLUSIVE)

- 2668 **ANNOTATED BIBLIOGRAPHY OF FARMING SYSTEMS STUDIES IN TANZANIA.** Minde, I. (1986)\* s.l.: Tanzania Agricultural Research Organization (TARO). (Tanzania Farming Systems Publications No.137; Contract AFR-0156-C-00-3033-00) 52p. **KEYWORDS:** Africa, Tanzania, bibliographies ++
- 2669 **BASILINE SURVEY FOR HANANG DISTRICT, TANZANIA: A DESCRIPTION OF AGRO-ECOLOGICAL ZONES, AGRICULTURAL PRODUCTION AND THE IMPACT OF VILLAGIZATION.** Kjærby, F. (1982)\* Copenhagen: Centre for Development Research. (CDR Project Papers, No.D.82.1, Jan. 1982) 47p. **KEYWORDS:** Africa, Tanzania, baseline data, surveys, agricultural production, villages, agroecosystems TZ.1
- 2670 **BENEFICIARY PROFILE OF HAUTE CHAOUIA (MOROCCO).** Morton, A. (1982) s.l.: s.n.. (Contract Number USAID/M-PSC-608-136-S-00-2006-00) 148p. **KEYWORDS:** Africa, Morocco, socioeconomic constraints, Rainfed Agriculture Project, woman's status, small farms, medium sized farms, large farms, cereals, credit, mechanization, FSR, cropping systems, social history, social organization, land accumulation, land fragmentation, animal sharing, employment MA.1
- 2671 **BURUNDI SMALL FARMING SYSTEMS RESEARCH PROJECT.** [1982?] [Washington: U.S. Agency for International Development (USAID)]. (USAID Project No.695-0106; includes USAID Inspector General Audit Report No.3-695-88-27, Sep. 23, 1988) 130p. **KEYWORDS:** Africa, Burundi, programs and projects, small farmers, institutions, appropriate technology, nutrition, food crops, evaluation BI.1
- 2672 **DIAGNOSTIC SURVEY OF MASWA AND MEATU DISTRICTS.** (Phase 1: Informal Survey) (1989)\* Amsterdam: Royal Tropical Institute. (Tanzania/Netherlands Farming Systems Research Project, Lake Zone; Working Paper No.4, July 1989) 64p. **KEYWORDS:** Africa, Tanzania, surveys, problem identification, environment, soils, population, livestock, land use, livestock, crops, crop husbandry, marketing, socioeconomic conditions, zoning, cropping patterns TZ.1
- 2673 **DIAGNOSTIC SURVEY OF BUKOBA DISTRICT.** (1989)\* Amsterdam: Royal Tropical Institute. (Tanzania/Netherlands Farming Systems Research Project, Lake Zone; Working Paper No.3, April 1989) 53p. **KEYWORDS:** Africa, Tanzania, surveys, soils, population, livestock, land use, crops, marketing, socioeconomic conditions, zoning, ecology, cropping patterns TZ.1

- 2674 **EVALUATION, CHOICE AND USE OF POTATO VARIETIES IN KENYA.** Crissman, L.M. (1989) Lima: International Potato Center (CIP). (Social Science Dept. Working Paper No. 1989-1) 44p. KEYWORDS: Africa, East Africa, Kenya, potatoes, varieties, evaluation, food preferences, food crops, cash crops, food production KE.1
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- 2677 **FARMING SYSTEMS SURVEY OF MANYU DIVISION, SOUTH WEST PROVINCE, REPUBLIC OF CAMEROON.** Almy, S.W. [1989]\* Buea, Cameroon: S.W. Almy, Cameroon National Institute of Agricultural Research (IRA)-Ekona, National Cereals Research and Extension Programme. 54p. KEYWORDS: Africa, Cameroon, surveys, planning of research, baseline data, environment, resources, cropping systems, tree cropping, maize, cassava, cocoyams, taro, plantains, bananas, yams, groundnuts, melons, beans, potatoes, rice, households, land, labor, cash crops, income, extension, livestock, markets, recommendations, farmers' attitudes CM.1
- 2678 **FARMING SYSTEMS SURVEY OF NDIAN DIVISION, SOUTH WEST PROVINCE, REPUBLIC OF CAMEROON.** Almy, S.W. [1989]\* Buea, Cameroon: S.W. Almy, Cameroon National Institute of Agricultural Research (IRA)-Ekona, National Cereals Research and Extension Programme. 50p. KEYWORDS: Africa, Cameroon, surveys, planning of research, baseline data, environment, resources, cropping systems, objectives, households, livestock, food crops, management, maize, cassava, cocoyams, taro, plantains, bananas, yams, groundnuts, melons, markets, cash crops, problem identification, income, labor, land, recommendations, farmers' attitudes CM.1

- 2679 **FARMING SYSTEMS RESEARCH AT THE NDFRS KATUMANI.** (With Special Reference to Semi-Arid Areas of Eastern Province of Kenya) Bakhtri, M.N. (1983) Machakos, Kenya: Ministry of Agriculture, Dryland Farming Research and Development Project. (Project Field Document No.2; Farming Systems Economics Research Program; Dryland Farming Research and Development Project (UNDP/FAO/KEN/74/017)) 65p. KEYWORDS: Africa, East Africa, Kenya, arid regions, semiarid zones, surveys, land use, soils, maize, beans, pigeon peas, cowpeas, sorghum, millets, labor productivity, animal production, cropping patterns, problem identification, recommended technology, evaluation, innovation adoption KE.1
- 2680 **FARMING SYSTEMS DATA AND ON-FARM TRIALS OF BEANS (PHASEOLUS VULGARIS): MGETA AND KILOSA AREAS, TANZANIA, 1985.** Due, J.M. (1986) Morogoro, Tanzania: Sokoine Univ. of Agriculture, Dept. of Rural Economy, and Univ. of Illinois at Urbana-Champaign, Dept. of Agricultural Economics. (Technical Report No.5; Sponsored by USAID through a Title XII Bean CRSP between Washington State Univ. and Sokoine Univ. of Agriculture) 97p. KEYWORDS: Africa, Tanzania, beans, phaseolus vulgaris, on-farm trials, economic analysis, pests, diseases, seeds, soils, precipitation, households, cropping patterns, food preferences TZ.1
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- 2684 **INDEX TO LIVESTOCK LITERATURE MICROFICED BY THE ILCA/IDRC TEAM IN ZIMBABWE.** Berhane, T. (comp.) (1986) Addis Ababa, Ethiopia: International Livestock Centre for Africa (ILCA). (IDRC - MP/RH - 1542/83) 235p. KEYWORDS: Africa, Zimbabwe, ILCA, IDRC, indexes, bibliographies, livestock, research centers, databases Z5074/L7/I57/1986b
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### **1.A CROPPING PATTERNS**

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2693 **METHODOLOGIE DE RECHERCHE-DEVELOPPEMENT EN AGRICULTURE.** Trebuil, G. (1982) Songkla, Thailand: Universite Prince de Songkla. (Projet de recherches sur les systemes de production agricole) 19p. **KEYWORDS:** research methodology, development theory, foundations, research development objectives, labor, production systems, rotations, cultivation 1.A

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### 1.A.1 POLYCULTURE

- 2696 **COMPETITION FOR RADIATION AND OTHER GROWTH RESOURCES IN MULTIPLE CROPPING SYSTEMS.** IN: Animal and Plant Sciences Francis, C. (1988) (Vol.1 no.1 p.105-09) 5p. **KEYWORDS:** cropping systems, multiple cropping, intercropping, polyculture, solar radiation, sustainability, plant competition, resource utilization, nutrients, water use 1.A.1
- 2697 **FARMING SYSTEMS ECONOMICS: FITTING RESEARCH TO FARMERS' CONDITIONS.** (Paper presented at the Second Symposium on Intercropping in Semi-Arid Areas, University of Dar-es-Salaam, Tanzania, August 1980) Gathee, J.W. (1980)\* Thika, Kenya: J.W. Gathee, Grain Legume Project, National Horticultural Research Station. 10p. **KEYWORDS:** Africa, East Africa, Kenya, semiarid zones, intercropping, maize, beans, recommendations, economic analysis, socioeconomic constraints KE.1.A.1
- 2698 **INTERCROPPING IN TROPICAL SMALLHOLDER AGRICULTURE WITH SPECIAL REFERENCE TO WEST AFRICA.** (2nd ed.) Steiner, K.G. (1984) Eschborn, W. Germany: Deutsche Gesellschaft für Technische Zusammenarbeit. (AID Doc. No. 080-PN-AAT-797) 304p. **KEYWORDS:** Africa, West Africa, tropics, intercropping, small farms, cropping systems, multiple cropping, agricultural production, constraints, food production, cassava, plantains, yams, rice, sorghum, millets, maize, environmental factors, polyculture, agronomy, yields, hybrids, soil fertility, fertilizers, pest management, weed control, plant diseases, problem identification, planning of research, land use, socioeconomic analysis, objectives, extension, methodology ++

### 1.A.3 FALLOWING AND COVER CROPPING, TILLAGE SYSTEMS

- 2699 **EVALUATION OF PRELIMINARY FARMING SYSTEMS TECHNOLOGIES: ZERO-TILLAGE SYSTEMS IN WEST AFRICA.** IN: Agricultural Systems Knipscheer, H.C. (1983) (Vol.11 p.95-103, 1983) 9p. **KEYWORDS:** Africa, West Africa, appropriate technology, technology development, evaluation, legumes, leuceana, maize, alley farming, minimum tillage systems S3/.A45

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- 2700 **SUMMER CROPS IN SYRIA.** IN: Studies of Farming Systems in Syria, 1977-79 Harvey, J. (1980) Norwich, England: ICARDA Farming Systems Research Programme, Overseas Development Group, Univ. of East Anglia. (Complementary to Vol.2, Farming Systems in Six Aleppo and Two Hama Villages) 36p. **KEYWORDS:** Asia, Middle East, Syria, farming systems research, FSR, crop production, watermelon, sesame, musk melon, agricultural zones, soil types SY.1.A.4

#### **1.A.5 SHIFTING CULTIVATION**

- 2701 **CROPPING SYSTEMS AND ROTATIONS DEVELOPMENT FOR IMPROVING SHIFTING CULTIVATION AND RELATED INTERMITTENT PRODUCTION SYSTEMS IN TROPICAL AFRICA.** IN: FAO Soils Bulletin Okigbo, B.N. (1984) (Vol.53 p.121-40, 1984) 20p. **KEYWORDS:** Africa, tropics, shifting cultivation, cropping systems, rotations, traditional farming, alley farming AFRICA.1.A.5

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- 2702 **ALLEY SHRUBS IN A HIGH-ALTITUDE, SEMI-ARID ENVIRONMENT.** IN: IITA Research Briefs Balasubramanian, V. (1989) (Vol.9 no.1, p.3, Mar. 1989; abstracted in Heifer Project Exchange, No.50 p.4, Sep./Oct. 1989) 1p. **KEYWORDS:** Africa, Rwanda, semiarid zones, woody plants, alley farming, shrubs, biomass, byproducts, fuelwood, hedges, altitude, agroforestry RW.1.A.6
- 2703 **OPPORTUNITIES AND CONSTRAINTS OF SMALL SCALE FARMS TO ADOPT AGROFORESTRY METHODS IN THE WESTERN USAMBARAS OF TANZANIA.** IN: Der Tropenlandwirt, Zeitschrift für die Landwirtschaft in den Tropen und Subtropen Baum, E. (1984) (p.67-76, Apr. 1984) 10p. **KEYWORDS:** Africa, Tanzania, small farms, agroforestry, erosion, soil conservation, constraints, land use, livestock farming TZ.1.A.6
- 2704 **PROMOTING THE "FERTILIZER BUSH" AMONG NIGERIAN FARMERS.** IN: VITA News Cashman, K. (1988) (p.7-10, July/Oct. 1988; to locate at KSU see Johnson, "Skits, Extension Agents...") 4p. **KEYWORDS:** Africa, Nigeria, alley farming, participation, agroforestry, fertilization, soil fertility, cropping systems CF.3.E.1.B.AA



- 2705 **PROMOTION OF TREE PLANTING ON SMALL FARMS IN THE AREA OF ACOSTA-PURISCAL, COSTA RICA.** (Prepared for the planning workshop "Planting Trees With Small Farmers," organized by the Pan American Development Foundation (PADF), Port-au-Prince, Haiti, Aug. 1985) Beer, J. (1985)\* Turrialba, Costa Rica: J. Beer, Centro Agronómico Tropical de Investigación y Enseñanza (CATIE). 9p. KEYWORDS: Latin America, Central America, Costa Rica, agroforestry, fruit trees, tree cropping, constraints, timber production, afforestation, demonstrations, objectives CR.1.A.6
- 2706 **ROLE OF FORESTRY IN DRY AFRICA.** IN: Journal of Forestry Harou, P.A. (1985) (p.142-47, Mar. 1985) 6p. KEYWORDS: Africa, Sahel, Sudan, arid regions, forestry, deforestation AFRICA.1.A.6
- 2707 **USE OF ETHNOECOLOGY IN AGROFORESTRY SYSTEMS RESEARCH: AN EXAMPLE OF AF TECHNOLOGY AND PEST MANAGEMENT RESEARCH IN KENYA.** (Paper presented at the Farming Systems Research and Extension Symposium, University of Arkansas, Fayetteville, Arkansas, Oct. 18-21, 1987 Rocheleau, D. (1987)\* [Nairobi: D. Rocheleau, International Center for Research in Agroforestry (ICRAF)]. 50p. KEYWORDS: Africa, East Africa, Kenya, agroforestry, case studies, appropriate technology, pest management, indigenous knowledge systems, ethnic groups, land use, traditional farming, ecology, cultural ecology, anthropology KE.1.A.6

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- 2708 **ADAPTATIONS OF FARMING SYSTEMS RESEARCH TO THE STUDY OF PASTORAL PRODUCTION SYSTEMS: THE NIGER RANGE AND LIVESTOCK PROJECT.** IN: Social Sciences and Farming Systems Research: Methodological Perspectives on Agricultural Development. J.R. Jones and B.S. Wallace, eds. Curry, J.J., Jr. (1986) Boulder, Colo.: Westview Press. (Westview Special Studies in Agriculture Science and Policy; p.195-220) 26p. KEYWORDS: Africa, West Africa, Niger, livestock production, animal husbandry, pastoralism S494.5/.S95/S6/1986
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- 2710 **FARMING SYSTEMS IN SIX ALEPPO AND TWO HAMA VILLAGES.** IN: Studies of Farming Systems in Syria, 1977-79 Harvey, J. (1980) Norwich, England: ICARDA Farming Systems Research Programme, Overseas Development Group, Univ. of East Anglia. (Vol.2; originally produced as an ICARDA Internal Document: Research Report No. 2, Sections 3 and 4; see also: Harvey, J., "Post-harvest Processing of Winter Crops in NW Syria") 346p. **KEYWORDS:** Asia, Middle East, Syria, farming systems research, FSR, comparative analysis, crop production, agricultural productivity, agricultural planning, rotations, commodity system analysis, labor, livestock, sheep, cash flow analysis, wheat, barley, lentils, vetch ++
- 2711 **GETTING MARKETING INTO FARMING SYSTEMS RESEARCH: A CASE STUDY FROM WESTERN SUDAN.** IN: Social Sciences and Farming Systems Research: Methodological Perspectives on Agricultural Development. J.R. Jones and B.S. Wallace, eds. Reeves, E.B. (1986) Boulder, Colo.: Westview Press. (Westview Special Studies in Agriculture Science and Policy; p.99-121) 23p. **KEYWORDS:** Africa, Sudan, methodology, agricultural economics, marketing, technology analysis, target selection, economic analysis, recommendation domains, market prices, surveys, prices, evaluation, anthropology S494.5/.S95/S6/1986
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- 2714 **MARGINAL AND STEPPE LIVESTOCK FARMING SYSTEMS IN ALEPPO PROVINCE.** IN: Studies of Farming Systems in Syria, 1977-79. Martin, A. (1980) Norwich, England: ICARDA Farming Systems Research Programme, Overseas Development Group, Univ. of East Anglia: (Vol.3; originally produced as an ICARDA Internal Document: Research Report No. 2, Section 6). 66p. **KEYWORDS:** Asia, Middle East, Syria, farming systems research, FSR, livestock, sheep, crop production, cropping patterns, agricultural productivity, livestock feeding, metabolizable energy, feeding habits ++

- 2715 **PRODUCTION RATIONALES: THE COMMERCIALIZATION OF SUBSISTENCE PASTORALISM.** Behnke, R.H. [1983?]\* s.l.: s.n.. 33p. **KEYWORDS:** Africa, East Africa, Libya, Somalia, Botswana, Finland, pastoralism, commercial farming, subsistence farming, livestock, history, labor, ranching, changes, land tenure, animal husbandry, demography, reindeer, sheep, goats, camels, cattle, productivity, economic analysis, range management, domestication, herd size, programs and projects 1.B
- 2716 **UNDERSTANDING EAST AFRICAN PASTORALISM: AN ECOSYSTEMS APPROACH.** IN: The Keeping of Animals: Adaption and Social Relations in Livestock Producing Communities. R. Berleant-Schiller and E. Shanklin, ed. Dyson-Hudson, R. (1983) Totowa, N.J.: Allenheld Osmun and Co.. (p.1-36) 36p. **KEYWORDS:** Africa, East Africa, pastoralism, agroecosystems, livestock HT421/.K43/1983
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- 1.C MIXED SYSTEMS**
- 2718 **ANIMAL TRACTION IN SUB-SAHARAN AFRICA.** IN: ILCA Bulletin (1981) (No.14 p.2-17, Dec. 1981) 16p. **KEYWORDS:** Africa, animal traction, draught animals, environmental factors, constraints, feed requirements, socioeconomic constraints, productivity SF15/.A25/I11
- 2719 **ANIMAL TRACTION IN AFRICA.** Munzinger, P., (comp.) (1982) Eschborn, Germany: German Agency for Technical Cooperation. (Translated by H. Burgess) 490p. **KEYWORDS:** Africa, Cameroon, Mali, Madagascar, Ghana, animal traction, animal husbandry, harnesses, oxen SF180/.H3613/1982
- 2720 **COWPEAS: THE PERFECT LISA CROP FOR LAMBS.** IN: Sheep! Magazine Swartz, H. (1990) (p.29, June 1990) 1p. **KEYWORDS:** sustainability, cowpeas, legumes, feed crops, sheep 1.C
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- 2723 **ECONOMIC ANALYSIS OF THE ROLE OF OX-PLOWING AND CATTLE-FEEDING IN THE STRATIFICATION OF WEST AFRICAN LIVESTOCK PRODUCTION.** (M.S. Thesis, University of Maryland) Sleeper, J.A. (1979) Ann Arbor, Mich.: Univ. of Michigan, Center for Research on Economic Development. (Livestock Production and Marketing in the Entente States of West Africa; Working Paper No.4; USAID Contract No.AID/afr-c-1169) 160p. KEYWORDS: Africa, West Africa, Sahel, Sudan, oxen, cattle, plowing, livestock production, stratification, economic analysis, grazing, crop production, fodder crops, pastures, animal traction, mixed farming, conservation, feeding, forestry, desertification, meat, yields, animal manures, intensive husbandry, small farms, technology transfers, income, problem identification, constraints, innovation adoption, integrated systems, appropriate technology, climatic factors AFRICA.1.C
- 2724 **FARMING SYSTEMS RESEARCH AND EXTENSION: INTRODUCING OXEN CULTIVATION IN ZAIRIAN FARMING SYSTEMS.** (M.S. Thesis) Lianabo, S. (1986) Athens, Ga.: S. Lianabo, Univ. of Georgia. 119p. KEYWORDS: Africa, Central Africa, Zaire, temperate zones, oxen, draught animals, animal power, mixed farming, budget analysis, risk analysis, agricultural economics, technology transfers S473/.Z28/L53/1986a
- 2725 **IMPROVED INTEGRATION OF LEGUME CROPS INTO THE AGRO-PASTORAL SYSTEM OF THE NUBA MOUNTAINS, SUDAN.** (Paper submitted to the Fifth Annual Farming Systems Research and Extension Symposium, Kansas State University, Manhattan, Kansas, Oct. 13-16, 1985) Bunderson, W.T. (1985)\* [Khartoum, Sudan?: W.T. Bunderson, Western Sudan Agricultural Research Project (WSARP) & Agricultural Research Corporation]. 27p. KEYWORDS: Africa, Sudan, semiarid zones, mixed farming, legumes, diet, cash crops, constraints, cropping systems, intercropping, animal husbandry, food shortages, land use, planning of research, economic analysis, livestock, on-farm trials, forage, animal production, problem identification SD.1.C
- 2726 **LIVESTOCK ECONOMY IN EGYPT: AN APPRAISAL OF THE CURRENT SITUATION.** Fitch, J. (1981) Davis, Calif.: Agricultural Development Systems: Egypt Project, Univ. of California. (Economics Working Paper Series, no.29) 41p. KEYWORDS: Africa, Egypt, livestock production, livestock planning, irrigated farming, mechanization, feedstuffs, policy, livestock sector, data evaluation, tenure systems, production trends, technological improvements EG.1.C

- 2727 **LIVESTOCK PRODUCTION IN CENTRAL MALI: THE 'MOUTON DE CASE' SYSTEM OF SMALLHOLDER SHEEP FATTENING.** IN: Agricultural Systems Kolff, H.E. (1985) (Vol.16 p.217-230, 1985; USAID Doc. No. PN-AAT-644) 14p. **KEYWORDS:** Africa, West Africa, Mali, semiarid zones, livestock, sheep, animal husbandry, feeding, diet, animal protein, value systems, rice, millets, mixed farming, socioeconomic status, constraints S3/.A45
- 2728 **MARKET FORCES AND LIVESTOCK DEVELOPMENT IN AFRICA: PART II: INTENSIVE PRODUCTION.** (Draft) (1982)\* Ann Arbor, Mich.: Univ. of Michigan, Center for Research on Economic Development. 29p. **KEYWORDS:** Africa, West Africa, Sahel, intensive production, objectives, rangeland, income, livestock, meat, feedlots, migration, exports, animal traction, feeding, cattle, small ruminants, seasonality, animal manures, oxen, feed supply, problem identification, programs and projects, marketing, stratification AFRICA.1.C
- 2729 **NOTE ON SELECTED EFFECTS OF ALTERNATIVE TECHNOLOGIES ON FARMING IN THE SALOUM AREA OF SENEGAL.** (Paper presented for Workshop on Sahelian Agriculture, West Lafayette, Ind., Purdue University, Department of Agricultural Economics, May 1980) Versel, M. (1980)\* s.l.: M. Versel. 9p. **KEYWORDS:** Africa, Senegal, Sahel, USAID, groundnuts, millets, animal traction, alternative technology, planting methods, intensive farming, traditional farming, fertilizers SN.1.C
- 2730 **ROLE FOR SMALL RUMINANTS IN SUSTAINABLE CROPPING SYSTEMS IN THE HUMID ZONE OF WEST AFRICA.** (Paper prepared for the Conference on Land Clearing and Development in the Tropics, International Institute for Tropical Agriculture, Ibadan, Nigeria, Nov. 23-26, 1982) Sumberg, J.E. (1982)\* Ibadan, Nigeria: J.E. Sumberg, Small Ruminant Programme, International Livestock Centre for Africa (ILCA). 11p. **KEYWORDS:** Africa, West Africa, humid zones, ruminants, small ruminants, cropping systems, sustainability, alley farming, crop production, animal production, livestock feeding, grazing, sheep, goats, mixed farming NG.1.C
- 2731 **SUMMARY REPORT OF A TOGO NETWORKSHOP: ANIMAL TRACTION IN A FARMING SYSTEMS PERSPECTIVE.** (FSSP Networkshop, Lama-Kara, Togo, Mar. 4-8, 1985) Poats, S. (1985) Gainesville, Fla.: S. Poats, Univ. of Florida, Institute of Food and Agricultural Sciences. 18p. **KEYWORDS:** Africa, West Africa, FSSP, animal traction, technology transfers, mixed farming, appropriate technology, programs and projects, diffusion of information, baseline data, surveys, solution design, training, planning of research, cattle, animal feeding, innovation adoption, methodology, tillage, livestock, soil fertility, evaluation, weeding, extension, on-farm testing AFRICA.1.C

## 1.D AQUACULTURE AND AGRICULTURE

- 2732 **ECONOMICS OF TILAPIA CULTURE IN KASAI OCCIDENTAL, ZAIRE.** Low, J.W. (1985) Ithaca, N.Y.: Cornell University, Department of Agricultural Economics. (Cornell International Agriculture Mimeograph 109) 43p. **KEYWORDS:** Africa, Zaire, fish culture, fish farming, USAID, economic analysis, food production, tilapia, aquaculture, households, income, extension, protein, labor, feeding, waste utilization, appropriate technology, innovation adoption, programs and projects ZR.1.D

## 2 PHYSICAL AND BIOLOGICAL FACTORS

- 2733 **AGRICULTURAL DEVELOPMENT INDICATORS.** Winrock International. (1987) Morillon, Ark.: Winrock International Institute for Agricultural Development. (pamphlet; Statistical Comparisons of 138 Developing Countries) 12p. **KEYWORDS:** agricultural development, statistics 2
- 2734 **ANNUAL RESEARCH REPORT, 1986-87.** (1987?) Institut National de la Recherche Agronomique: Settat, Morocco. (Aridoculture program, INRA-MIAC, USAID project no. 608-0136) 77p. **KEYWORDS:** Africa, Morocco, farm size, tractors, cereals, legumes, operating costs, crop production, agricultural economics, cereal breeding, semiarid zones, arid regions, resistance genes, plant pathology, sociology, methodology ++
- 2735 **ANNUAL RESEARCH REPORT, 1985-86.** [1986?] Institut National de la Recherche Agronomique: Settat, Morocco. (Aridoculture program, INRA-MIAC, USAID project no. 608-0136) 320p. **KEYWORDS:** Africa, North Africa, Morocco, dry farming, insect pests, Hessian fly, wheat, cereals, plant diseases, fertilizers, water management, weed control, tillage systems, mechanization, forage crops, range management, legumes, crop production, livestock production, agricultural economics, plant breeding, semiarid zones, arid regions, resistance genes, plant pathology ++
- 2736 **BACK TO EDEN.** IN: The Atlantic Eisenberg, E. (1989) (p.57-89, Nov. 1989) 20p. **KEYWORDS:** USA, Kansas, sustainability, alternative farming, prairies, prairies-native, prairies--domestic, grasses, Land Institute, environment, plant genetics, genetic diversity, feral varieties, no-tillage systems, soil management, cultivation AP2/.A8
- 2737 **CIAT AND SUSTAINABLE AGRICULTURAL PRODUCTION.** IN: CIAT International (1989) (Vol.8 no.1 p.3-5, July 1989) 3p. **KEYWORDS:** sustainability, agroecosystems, pastures, savanna, beans 2

- 2738 **DEVELOPMENT PROJECTS FOR THE SMALL FARMER: LESSONS FROM EASTERN AND CENTRAL AFRICA IN ADAPTING CONSERVATION.** IN: Soil Erosion and Conservation. S.A. El-Swaify, W.C. Moldenhauer, and A. Lo, eds. Stocking, M. (1985) Ankeny, Iowa: Soil Conservation Society of America. (p.747-58) 12p. **KEYWORDS:** Africa, East Africa, Central Africa, Zambia, Tanzania, programs and projects, small farmers, environmental factors, soil erosion, soil conservation, cattle, intercropping, polyculture S622.2/.S65/1985
- 2739 **DRYLAND FARMING APPLIED RESEARCH PROJECT.** (1986) s.l.: Institut national de la recherche agricole (INRA) & MidAmerica International Agricultural Consortium (MIAC). (Scientific Review Panel Report, USAID Project No.608-0136 41p. **KEYWORDS:** Africa, North Africa, Morocco, arid regions, dry farming, problem identification, technology analysis, agronomy, cereal agronomy, soil fertility, weed science, entomology, plant pathology, forage agronomy, food legumes, cereal breeding, agricultural engineering, socioeconomic conditions MA.2
- 2740 **DRYLAND FARMING APPLIED RESEARCH PROJECT.** (1988) Settati, Morocco: Institut National de la Recherche Agricole (INRA) Centre Regional de la Recherche Agronomique & MidAmerica International Agricultural Consortium (MIAC). (Scientific Review Panel Report, USAID Project No.608-0136 41p. **KEYWORDS:** Africa, North Africa, Morocco, arid regions, dry farming, problem identification, technology analysis, plant pathology, cereal breeding, agricultural economics, socioeconomic conditions MA.2
- 2741 **DRYLAND FARMING APPLIED RESEARCH PROJECT: INTEGRATED PLAN OF WORK.** (Projet Aridoculture) [1986?]\* [Settati, Morocco: MidAmerica International Agricultural Consortium]. (An INRA-MIAC project; USAID Project No. 608-0136 307p. **KEYWORDS:** Africa, North Africa, Morocco, dry farming, project design, work plans, cereal breeding, food legumes, forage agronomy, soil fertility, soil management, entomology, training, institution building, technology transfers ++
- 2742 **FARMING SYSTEMS RESEARCH PROGRAM: BACKGROUND TO STUDIES IN ALEPPO PROVINCE.** (1980) Aleppo, Syria: International Center for Agricultural Research in the Dry Areas (ICARDA). (Internal Document, Research Report No.2, Section 2 of 7) 36p. **KEYWORDS:** Asia, Middle East, Syria, farming systems research, FSR, environment, agroclimatology SY.2
- 2743 **FARMING SYSTEMS RESEARCH PROGRAM: REVIEW, DISCUSSION AND RECOMMENDATION.** (1980) Aleppo, Syria: International Center for Agricultural Research in the Dry Areas (ICARDA). (Internal Document, Research Report No.2, Section 7 of 7) 28p. **KEYWORDS:** Asia, Middle East, Syria, FSR, environment, natural resources, farm inputs, agricultural productivity SY.2



- 2744 **INDEX OF SUSTAINABLE AGRICULTURE PERIODICALS.** IN: International Ag-Sieve (1989) (Vol.2 no.3 p.1-7, 1989) 7p. **KEYWORDS:** indexes, periodicals, sustainability, organic farming 2
- 2745 **KENYA: DRYLANDS CROPPING SYSTEMS RESEARCH PROJECT.** (1979)\* Washington: U.S. Agency for International Development (USAID). (Project Paper; USAID Project No.615-0180) 125p. **KEYWORDS:** Africa, East Africa, Kenya, semiarid zones, programs and projects, project proposals, appropriate technology, recommendations, technology transfers, cropping systems KE.2
- 2746 **OAU/STRC JOINT PROJECT 31: IITA/SAFGRAD FINAL REPORT, PHASE 1.** Rodriguez, M. (1986) Ouagadougou, Burkina Faso: International Institute of Tropical Agriculture (IITA). (USAID Doc. No.PD-AAU-169; Funded by USAID and IDRC) 42p. **KEYWORDS:** Africa, West Africa, Burkina Faso, Guinea, Sudan, semiarid tropics, savanna, maize, cowpeas, drought resistance, disease resistance, variety trials, varieties, soil fertility, fertilizers, crop rotations, tillage, crop residues, tie ridging, ditches, scarification, planting, animal traction, pest control, pest resistance, germplasm, soil management, water management, plant breeding, programs and projects, training, constraints, problem identification AFRICA.2
- 2747 **PAPEL DE LAS LEÑOSAS PERENNES EN LOS SISTEMAS AGROSILVOPASTORILES.** Torres, F. (1985)\* Turrialba, Costa Rica: Centro Agronómico Tropical de Investigación y Enseñanza (CATIE). (Originally published in Agroforestry Systems and titled: "Role of Woody Perennials in Animal Husbandry;" Vol.1 p.131-63, 1982) 46p. **KEYWORDS:** agroforestry, woody plants, animal husbandry, fuelwood, fodder crops, perennials, mixed farming, soil conservation, water conservation 2
- 2748 **POTENTIAL FOR REGENERATIVE AGRICULTURE IN THE DEVELOPING WORLD.** IN: American Journal of Alternative Agriculture Francis, C.A. (1986) (Vol.1 no.2 p.65-74, Spring 1986) 10p. **KEYWORDS:** sustainability, alternative farming, food production, inputs, nitrogen, nutrients, diseases, weeds, yields, organic farming, pest control, integrated pest management S605.5/.A475
- 2749 **SAHELIAN/SUDANIAN ZONES OF AFRICA: PROFILE OF A FRAGILE ENVIRONMENT.** Thomas, G.W. (1981) Las Cruces, N.M.: New Mexico State Univ., Center for International Programs. (New Mexico State Univ. International Publications Series Technical Information Publication 0001-81; Report to the Rockefeller Foundation) 139p. **KEYWORDS:** Africa, Sahel, Sudanian zone, environment, natural resources, demography, food production, infrastructure, development organizations, desertification, land use, education, training, technology transfers ++

- 2750 **SUSTAINABLE AGRICULTURAL PRODUCTION.** IN: International Agriculture Update York, E.T. (1989) (Univ. of Illinois at Urbana-Champaign; Vol.4 no.4 p.1-4, 1989) 4p. **KEYWORDS:** sustainability, environment, policy, agricultural production  
2

#### **2.A.1 LAND, SOILS, AND FERTILIZER**

- 2751 **ECONOMIC PERFORMANCE OF EIGHT FERTILIZER COMBINATIONS FOR GRAIN AND STRAW PRODUCTION DURING THE 1984-85 CROP YEAR.** Rafsnider, G.T. (1986)\* [Settat, Morocco?: G.T. Rafsnider, MIAC Agricultural Economist]. (MIAC Agric. Econ. Info Rpt. No. 2) 4p. **KEYWORDS:** Africa, North Africa, Morocco, fertilizers, economic performance, cereals, straw MA.2.A.1
- 2752 **FERTILIZER ALLOCATION, DISTRIBUTION, AND USE IN EGYPT.** Lynch, J. (1980) 55p. **KEYWORDS:** North Africa, Egypt, fertilizers, policy, allocation, chemical fertilizers, precipitation, arable land, crops, nitrogen production, credit, price policy, black market, soils EG.2.A.1
- 2753 **FOOD CROP FERTILIZATION AND SOIL FERTILITY: THE IRAT EXPERIENCE.** IN: Appropriate Technologies for Farmers in Semi-Arid West Africa. H.W. Ohm and J.G. Nagy, eds. Pieri, C. (1985) West Lafayette, Ind.: Purdue University. (p.74-109) 36p. **KEYWORDS:** Africa, West Africa, semiarid zones, IRAT, fertilization, soil fertility, food crops, yields, crop residues, nitrogen fixation, leguminosae ++
- 2754 **KENYANS SHORE UP HOPES - AND TOPSOIL - WITH TERRACES.** IN: Christian Science Monitor Press, R.M. (1988) (p.11, May 9, 1988) 1p. **KEYWORDS:** Africa, East Africa, Kenya, semiarid zones, erosion, soil conservation, terracing, terrace farming KE.2.A.1

#### **2.A.2 AGROCLIMATOLOGY**

- 2755 **AGROCLIMATOLOGY OF WEST AFRICA: BURKINA FASO.** Sivakumar, M.V.K. (1987) Patancheru, Andhra Pradesh, India: International Crops Research Institute for the Semi-Arid Tropics. (Information Bulletin no.23) 192p. **KEYWORDS:** West Africa, Burkina Faso, agroclimatology, physiology, soils, vegetation, animal husbandry, climate, data, precipitation, temperature, evapotranspiration, water balance, growing season, probability analysis ++

- 2756 **CASE STUDY OF A SUCCESSFUL SOIL MANAGEMENT RESEARCH AND EXTENSION PROJECT MOUNTED WITHIN THE SEMI-DECIDUOUS RAINFOREST ZONE OF GHANA.** Obeng, H.B. [198?] Ames, Iowa: H.B. Obeng, Visiting Scientist, Dept. of Agronomy, Iowa State Univ.. 55p. KEYWORDS: Africa, West Africa, Ghana, soils, soil management, agroforestry, case studies, programs and projects, rainforests GH.2.A.2
- 2757 **DEPENDABLE PRECIPITATION AND POTENTIAL YIELDS FOR SENEGAL: A PRACTICAL GUIDE FOR RAINFED AGRICULTURE.** Hargreaves, G. (1982) Washington: U.S. Agency for International Development (USAID). (USAID Doc. no. PN-AAL-110) 34p. KEYWORDS: Africa, Senegal, USAID, rain-fed farming, precipitation, growth factors, climate, climatic factors, crop research, crop production, cropping systems, methodology, yields, surveys--long term SN.2.A.2
- 2758 **FARMING SYSTEMS RESEARCH PROGRAM: PHYSICAL ENVIRONMENT AND CROP PRODUCTION.** (1980) Aleppo, Syria: International Center for Agricultural Research in the Dry Areas (ICARDA). (Internal Document, Research Report No.2, Section 5 of 7) 106p. KEYWORDS: Asia, Middle East, Syria, farming systems research, FSR, crop production, natural resources, agricultural productivity, agroclimatology SY.2.A.2
- 2759 **WHY THE POOR SUFFER MOST: DROUGHT AND THE SAHEL.** Twose, N. (1984) Oxford: Oxfam Publications Dept., 274 Banbury Rd., Oxford OX2 7DZ. (Behind the Weather Series) 20p. KEYWORDS: Africa, West Africa, Sahel, drought, famine, weather, climate, food production AFRICA.2.A.2

## 2.A.3 WATER AND WATER MANAGEMENT

- 2760 **EVALUATION INTERIME DE DEUX PROJETS DE LA PRODUCTION AGRICOLE AU SENEGAL: L'ANALYSE ECONOMIQUE DE CULTURE IRRIGUEE ET SUR TERRAIN SEC.** Franzel, S. 1979 East Lansing, Mich.: Michigan State University, Department of Agricultural Economics. (African Rural Employment/Economy Working Paper No. 28) 66p. KEYWORDS: Africa, Senegal, arid regions, evaluation, agricultural production, economic analysis, irrigation, rain-fed farming, dry farming HD2144.5/.F72/1979

## 2.B BIOLOGICAL FACTORS

- 2761 **CONSERVING THE WILD RELATIVES OF CROPS.** Hoyt, E. (1988) Rome: Food and Agriculture Organization of the U.N. (FAO), International Board for Plant Genetic Resources. 45p. KEYWORDS: genetic resources, genetic diversity, varieties, gene banks, conservation, plant genetics, food crops, feral varieties, wild plants 2.B

- 2762 **DESIGN OF A MILLET PRODUCTION/ INTEGRATED PEST MANAGEMENT PILOT PROGRAMME FOR THE GAMBIA.** (Report of a workshop held in Banjul, Gambia, April 11-20, 1984) (1984)\* s.l.: s.n.. (Report to the Food and Agriculture Organization of the U.N. (FAO)) 48p. **KEYWORDS:** Africa, Gambia, programs and projects, pilot projects, project design, FAO, millets, pest control, integrated pest management, surveys, planning of research, problem identification, baseline data, insects, weed control, crop production, seeds, fertilizers, technology transfers GM.2.B
- 2763 **GLIRICIDIA SEPIUM (JACQ.) STEUD: A SELECTED BIBLIOGRAPHY.** Sumberg, J.E. (1986) Addis Ababa, Ethiopia: International Livestock Centre for Africa. 12p. **KEYWORDS:** bibliographies, leguminosae, gliricidia sepium, agroforestry, green manure, fuelwood, fodder crops, alley farming 2.B
- 2764 **ROLE OF FODDER TREES IN LIVESTOCK PRODUCTION.** IN: Asian Livestock Samuel, C. (1990) (Vol.15 no.1 p.1-9, Jan. 1990) 9p. **KEYWORDS:** agroforestry, fodder crops, livestock feeding 2.B
- 2765 **WATER CAUSED DESERT, DESERT EVERYWHERE.** IN: Christian Science Monitor (1988) (May 19, 1988) 1p. **KEYWORDS:** Africa, East Africa, Kenya, water, desertification, deforestation, nomadism, environmental degradation KE.2.B

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- 2766 **AMARANTH: WILD GREENS AND ANCIENT GRAIN.** IN: New Mexico Magazine Seidel, M. (1983) (p.65-6, Dec. 1983; to locate at KSU see Masson, "Old-Time Honest...") 2p. **KEYWORDS:** cereals, food crops, amaranth, amaranthus hypochondriacus, amaranthus retroflexus, feral varieties, varieties 2.B.1
- 2767 **ANCIENT SEEDS AGAINST MODERN HUNGER.** IN: Santa Fe Reporter Basquin, S. (1985) (Living Section p.1, May 8, 1985; to locate at KSU see Masson, "Old-Time Honest...") 2p. **KEYWORDS:** cereals, seeds, vegetables, varieties, maize, amaranth, drought resistance 2.B.1
- 2768 **ANCIENT, NUTRITIOUS GRAIN REDISCOVERED BY SCIENTISTS.** IN: The New Mexican Brody, J.E. (1984) (p.C-8, Oct. 24, 1984; to locate at KSU see Masson, "Old-Time Honest...") 1p. **KEYWORDS:** amaranth, cereals, nutrition, varieties, heat resistance, vegetables 2.B.1

- 2769 **COLLOQUIUM ON GENETICS AND BREEDING OF SMALL GRAINS FOR SEMI-ARID CONDITIONS OF THE NORTH AMERICAN GREAT PLAINS AND MOROCCO.** (Proceedings of a Colloquium held at the University of Nebraska, Lincoln, Nebraska, July 11-12, 1985) Bigbee, D.E. Sr. (ed.) (1985) Lincoln, Neb.: Univ. of Nebraska, MidAmerica International Agricultural Consortium (MIAC). (Sponsored by MAROC/INRA/MIAC Dryland Farming Research Project and UNL/IANR International Programs Division) 78p. **KEYWORDS:** Africa, Morocco, North America, Great Plains, semiarid zones, cereals, food grains, plant breeding, genetics, disease resistance, pest resistance, nutritional value, wheat, barley MA.2.B.1
- 2770 **CROP IMPROVEMENT IN DEVELOPING NATIONS.** IN: Seed World Underwood, W. (1984) (p.38-9, June 1984; to locate at KSU see Masson, "Old-Time Honest...") 2p. **KEYWORDS:** crops, improved varieties 2.B.1
- 2771 **DEVELOPING COWPEA VARIETIES WITH IMPROVED YIELD UNDER CONDITIONS OF EXTREME DROUGHT AND HEAT.** IN: Research Highlights: Michigan State University, Bean/Cowpea CRSP Ghaderi, A. (ed.) (1984) (Vol.1 no.1 p.1-4, 1984) 4p. **KEYWORDS:** Africa, Sahel, Senegal, semiarid zones, cowpeas, drought, ISRA, cultivars, rain-fed farming, heat resistance, variety trials, performance testing, high yielding varieties, drought resistance SN.2.B.1
- 2772 **EVALUATION DU POIS-CHICHE D'HIVER PAR DES AGRICULTEURS DE LA CHAOUIA (1986-1987).** Herzenni, A. (?) (s.l.): (s.n.). 13p. **KEYWORDS:** Africa, Morocco, chickpeas--winter, food preparation, fertilization, mechanization, soils, yields, chickpea variation, grain calibre, commercialization MA.2.B.1
- 2773 **FARMER MANAGEMENT OF VARIETAL BEAN MIXTURES IN CENTRAL AFRICA: IMPLICATIONS FOR A TECHNOLOGY DEVELOPMENT STRATEGY.** Voss, J. [1988?]\* Cali, Colombia: J. Voss, Centro Internacional de Agricultura Tropical (CIAT). 26p. **KEYWORDS:** Africa, Central Africa, beans, seed mixtures, yields, food supply, farmers' attitudes, experiment stations, plant diseases, varieties, seed selection, women in agriculture, marketing, disease resistance, consumer preferences, phaseolus vulgaris, prices, genetic variation AFRICA.2.B.1
- 2774 **HIGH-YIELD CORN FROM ANCIENT SEED STRAINS.** IN: Christian Science Monitor Stea, V. (1985) (p.29, Aug. 20, 1985; to locate at KSU see Masson, "Old-Time Honest...") 2p. **KEYWORDS:** cereals, maize, varieties, seeds, drought resistance 2.B.1
- 2775 **HOW DOMESTICATED PLANTS CAME TO THE PREHISTORIC SOUTHWEST.** IN: El Palacio Tierney, G.D. [1983?] (Vol.? no.? p.11-17, 1983?; to locate at KSU see Masson, "Old-Time Honest...") 7p. **KEYWORDS:** cereals, legumes, varieties, seeds, maize, beans 2.B.1

- 2776 **KSU/INTSORMIL SORGHUM/MILLET AGRONOMIC RESEARCH IN NORTH KORDOFAN, SUDAN, AFRICA.** Berhe, T. (1985) Lincoln, Neb.: University of Nebraska, Institute of Agriculture and Natural Resources and International Sorghum/Millet Collaborative Research Support Program (INTSORMIL/CRSP). (Progress Report No. 7; Annual Report 1985; USAID Contract No. DSAN/XII-G-0149) 35p. **KEYWORDS:** Africa, Sudan, INTSORMIL, USAID, sorghum, millets, fertilizers, on-farm trials, dry farming, intercropping, seeds, sowing, legumes, germplasm, experiment stations, evaluation, recommendations, yields, technology transfers, genotypes, drought resistance SD.2.B.1
- 2777 **NEW DIMENSIONS FOR FABA BEAN RESEARCH AND PRODUCTION IN EGYPT AND SUDAN.** (A Profile of the ICARDA/IFAD Nile Valley Project) (1982) Aleppo, Syria: International Center for Agricultural Research in the Dry Areas (ICARDA). 20p. **KEYWORDS:** Africa, Egypt, Sudan, ICARDA, IFAD, dry farming, faba beans, constraints, on-farm trials, yields, nutrition, hybrids, water management, disease resistance, surveys, programs and projects, extension, experiment stations, seed production, objectives SD.2.B.1
- 2778 **NEW LOOK AT THE IMPORTANCE OF CULTIVARS IN COWPEA RESEARCH: EVIDENCE FROM NORTHERN CAMEROON.** IN: Research Highlights: Michigan State University Bean/Cowpea CRSP Ta'Ama, M.E. (1985) (Vol.2 no.5 p.1-4, 1985) 4p. **KEYWORDS:** Africa, Cameroon, semiarid zones, cowpeas, cultivars, SAFGRAD, on-farm testing, yields, disease resistance, drought resistance, variety trials, surveys CM.2.B.1
- 2779 **OLD-TIME HONEST AMARANTH IS A GOOD CROP FOR SUMMER.** IN: The New York Times Masson, W. (1984) (p.H-29, May 27, 1984) 1p. **KEYWORDS:** amaranth, amaranthus tricolor, heat resistance, vegetables 2.B.1
- 2780 **POTATOES IN CENTRAL AFRICA: A SURVEY OF BURUNDI, RWANDA AND ZAIRE.** Scott, G.J. (1988) Lima: International Potato Center (CIP). 159p. **KEYWORDS:** Africa, Central Africa, Burundi, Rwanda, Zaire, potatoes, crop production, food distribution and marketing ++
- 2781 **QUINUA: GRAIN OF THE INCAS.** IN: The Ecologist Cusack, D.F. (1984) (Vol.14 no.1 p.21-31, 1984) 11p. **KEYWORDS:** South America, Andean region, altiplano, cereals, food crops, staple crops, quinoa, varieties, drought resistance, Chenopodium quinoa, Chenopodium palidacuale, Chenopodium nuttalliae QH540/E295/E25
- 2782 **SEED POTATO PRODUCTION IN EAST AFRICA.** Wiersema, S.G. (1980) Lima: International Potato Center (CIP). 24p. **KEYWORDS:** Africa, East Africa, potatoes, seed potatoes, seed production, methodology AFRICA.2.B.1

- 2783 **SEEDS OF WEALTH - SEEDS OF RISK? THE VULNERABILITY OF HYBRID MAIZE PRODUCTION IN THE SOUTHERN HIGHLANDS OF TANZANIA.** Friis-Hansen, E. (1989) Copenhagen: Centre for Development Research (CDR). (CDR Project Paper No.88.2) 67p. **KEYWORDS:** Africa, East Africa, Tanzania, maize, seeds, hybrids, varieties, sustainability, pest resistance, high yielding varieties, food crops, plant genetics, environmental degradation TZ.2.B.1
- 2784 **SORGHUM IMPROVEMENT IN EASTERN AFRICA.** (Proceedings of the Regional Workshop on Sorghum Improvement in Eastern Africa, Oct. 17-21, 1982, Nazareth and Debre Zeit, Ethiopia Gebrekidan, B. (ed.) (1982) Nazareth, Ethiopia: Ethiopian Sorghum Improvement Project. 196p. **KEYWORDS:** Africa, Eastern Africa, Ethiopia, Rwanda, Kenya, Somalia, Sudan, Tanzania, Uganda, Yemen, Zimbabwe, sorghum, national programs and projects, plant genetics, institutions, diseases, pests, striga, nutrition, plant breeding ++
- 2785 **TEPARY BEANS: A RESOURCE FOR IMPROVEMENT OF COMMON BEANS.** IN: Research Highlights: Michigan State University Bean/Cowpea CRSP Webster, B.D. (1985) (Vol.2 no.3, 1985) 4p. **KEYWORDS:** Africa, East Africa, Kenya, arid regions, beans, tepary beans, phaseolus acutifolius, drought resistance, heat resistance, varieties, varietal improvement KE.2.B.1
- 2786 **TRUE POTATO SEED: A POTENTIAL ALTERNATIVE FOR POTATO PRODUCTION IN KENYA.** (Paper originally presented at a research seminar at Egerton University College, Njoro, Kenya, Feb. 7, 1985) M'Ribu, H.K. (1986) Njoro, Kenya: Egerton Univ. College. (Research Paper Series No.12, Dec. 1986) 13p. **KEYWORDS:** Africa, East Africa, Kenya, potatoes, seeds, crop production, food crops KE.2.B.1
- 2787 **USE OF LABLAB BEAN (DOLICHOS LABLAB) BY TRADITIONAL FARMERS IN HONDURAS.** Flores, M. (1989)\* Tegucigalpa, Honduras: International Cover Crop Clearinghouse; Apdo. 278-C; Tel.32-6474. 8p. **KEYWORDS:** Central America, Honduras, traditional farming, beans, lablab beans, dolichos lablab, intercropping, maize, fodder crops, food crops, feed crops, legumes HN.2.B.1
- 2788 **VARIETAL TRAITS LIMITING THE GRAIN YIELD OF TROPICAL MAIZE I, II, III, IV.** IN: Soil Science and Plant Nutrition Yamaguchi, J. (1974) (Vol. 20 nos.1-3 p.69-78 (I), p.145-54 (II), p.155-61 (III), p.287-304 (IV), 1974) 38p. **KEYWORDS:** Latin America, Mexico, tropics, cereals, maize, yields, growth yield relationship, growth analysis, growth factors, growth inhibitors, growth promoters, growth period, altitude, varieties, tillage MX.2.B.1

## **2.B.2 CROP PROTECTION**

- 2789 **INTEGRATED PEST MANAGEMENT: RICE CROP PROTECTION IN THE PHILIPPINES WITHOUT HAZARDS FOR THE ENVIRONMENT.** IN: AT Source Reus, J. (1990) (Vol.17 no.2 p.4-11, 1990) 8p. **KEYWORDS:** Asia, Pacific, Philippines, integrated pest management, pest control, environment, rice, diseases, pest resistance PH.2.B.2

### **2.B.2.C FUNGI AND BACTERIA**

- 2790 **ADAPTION OF THE POTATO TO THE LOWLAND TROPICS.** International Potato Center. (1975) Lima: International Potato Center (CIP). (Report of the International Potato Center Planning Conference held in association with the Sixth Triennial Conference of the European Association for Potato Research, Wageningen, Netherlands, Sep., 1975) 25p. **KEYWORDS:** potatoes, tropics, diseases, varieties 2.B.2.C

## **2.B.3 ANIMALS**

- 2791 **PERFORMANCE OF EXOTIC DAIRY CATTLE UNDER DIFFICULT ENVIRONMENTS.** IN: Asian Livestock Khan, U.N. (1990) (Vol.15 no.2 p.17-23, Feb. 1990) 7p. **KEYWORDS:** tropics, subtropics, dairy cattle, cattle breeds, diseases 2.B.3
- 2792 **POULTRY WASTE IN CATTLE RATIONS.** IN: East African Agricultural and Forestry Journal Odhuba, E.K. (1987) (Vol.52 p.16-26, 1986; abstracted in Heifer Project Exchange, No.50 p.4, Sep./Oct. 1989) 11p. **KEYWORDS:** Africa, East Africa, Kenya, livestock feeding, animal nutrition, ruminants, nitrogen KE.2.B.3

### **2.B.3.A ANIMAL PARASITES**

- 2793 **EFFECT OF PPR CONTROL AND DIPPING ON VILLAGE GOAT POPULATIONS IN SOUTHWEST NIGERIA.** IN: ILCA Bulletin Reynolds, L. (1988) (no.32 p.22-27, Nov. 1988) 6p. **KEYWORDS:** Africa, West Africa, Nigeria, goats, ruminants, diseases, livestock, animal health SF15/.A25/I11



### **3      HUMAN ELEMENT: EXOGENOUS FACTORS**

- 2794 **ANIMATION RURALE AND RURAL DEVELOPMENT: THE EXPERIENCE OF SENEGAL.** Gellar, S. (1980) Ithaca, N.Y.: Cornell University, Center for International Studies, Rural Development Committee. (Special Series on Animation RURale: No.2) 211p. **KEYWORDS:** Africa, Senegal, rural development, USAID, Animation RURale, development theory, extension, development projects, development policy, analysis, case studies, social policy, history    HN829.Z9C63
- 2795 **APPLIED AGRONOMIC RESEARCH PROGRAM FOR DRYLAND FARMING IN 200-400 MM RAINFALL ZONE OF MOROCCO.** (1977) [Lincoln, Neb.?: MidAmerica International Agricultural Consortium]. (Contract No. AID/NE-C-1284, Univ. of Nebraska) 187p. **KEYWORDS:** Africa, North Africa, Morocco, arid regions, agronomy, dry farming, training, participation, evaluation, USAID, agrarian reform, institutionalization, precipitation, soil moisture, cropping patterns, soil types, extension, fertilizers, soil fertility, productivity, tillage, soil testing, forage, livestock systems, range management, forage seed production, livestock nutrition, machinery, equipment, socioeconomic conditions, rural households, land use, cereals, draught animals, animal power, tractors, marketing, price policy, credit, cooperatives, land tenure, labor supply, women, land tenancy, technology transfers    ++
- 2796 **DEVELOPPEMENT ZONAL DANS LA TUNISIE CENTRALE: RAPPORT FINAL DE CONSULTATION.** Boyle, W. (1986) Worcester, Mass.: Clark University. (Cooperative Agreement on Human Settlements and Natural Resource Systems Analysis) 127p. **KEYWORDS:** Africa, Tunisia, development zones, exploitation model, socioeconomic analysis, annual production, financial planning, investment, credit, projects, environment, resources, social environment, population, living conditions, human resources, irrigation    TN.3
- 2797 **FARM AND VILLAGE PRODUCTION SYSTEMS IN THE SEMI-ARID TROPICS OF WEST AFRICA: AN INTERPRETIVE REVIEW OF RESEARCH.** Norman, D.W. (1981) Patancheru, Andhra Pradesh, India.: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). 94p. **KEYWORDS:** Africa, West Africa, semiarid tropics, agricultural production, production systems, village level studies, research, economic analysis, FSR, institutions    S472/.W4/N67
- 2798 **NEW APPROACH OF TACKLING ZAMBIA'S ECONOMIC ILLS - A CRITIQUE.** (Paper presented to Professor E.W. Nafziger as partial fulfillment of course requirements for "Economics of Underdeveloped Countries," KSU, Summer 1987) Mulenga, K.B. (1987)\* Manhattan, Kan.: K.B. Mulenga, Kansas State University. 39p. **KEYWORDS:** Africa, Zambia, economic analysis, poverty, income distribution, employment, migration, population growth, rural development, infrastructure, policy, economic theories    ZM.3

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### 3.A SOCIAL ORGANIZATION AND COMMUNITY STRUCTURE

- 2800 **ABSENTEE HERD OWNERS AND PART-TIME PASTORALISTS: THE POLITICAL ECONOMY OF RESOURCE USE IN NORTHERN KENYA.** IN: Human Ecology Little, P.D. (1985) (Vol.13 no.2 p.131-51, 1985) 21p. KEYWORDS: Africa, East Africa, Kenya, pastoralism, resource management, political economy, communal tenure, communal grazing, range management, environmental degradation, tenure, grazing patterns, livestock sector KE.3.A
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- 2812 **FOOD CONSUMPTION SURVEY IN GUIDIMAKA, GORGOL, BRAKNA AND TRARZA REGIONS.** IN: Farming Systems Research Along the Senegal River Valley Frankenberger, T.R. (1986) Tucson, Ariz.: Univ. of Arizona, College of Agriculture. (Mauritania Agricultural Research Project II; Report No.3, Apr. 1986) 105p. **KEYWORDS:** Africa, West Africa, Mauritania, semiarid zones, surveys, food consumption, food preferences, food preparation, food prices, food storage, food distribution, wild plants, diseases, women, gardens, food shortages, seasonality ++
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- 2814 **KENYA'S EXPERIENCE WITH WOMEN'S GROUPS IN AGRICULTURAL EXTENSION: STRATEGIES FOR ACCELERATING IMPROVEMENTS IN FOOD PRODUCTION AND NUTRITIONAL AWARENESS IN AFRICA.** IN: Agricultural Administration Muzaale, P.J. (1985) (Vol.19 p.13-28, 1985) 16p. **KEYWORDS:** Africa, East Africa, Kenya, women in agriculture, extension, nutrition, food production HD1401/.A36
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- 3.E EXTERNAL INSTITUTIONS**
- 2819 **MAINTIEN D'UNE PROMESSE: LE DEVELOPPEMENT AGRICOLE AU SAHEL.** (1987) Washington, D.C.: U.S. Congress, Office of Technology Assessment. (Rapport Special De L'OTA) 36p. **KEYWORDS:** West Africa, Sahel, background, development programs, poverty, technology, politics, USAID, development aid, Peace Corps Africa.3.E
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### **3.E.1 INFRASTRUCTURE, SUPPORT SYSTEMS**

- 2821 **CO-OPERATIVE VEGETABLE GROWING AND MARKETING IN THE GAMBIA.** IN: Agricultural Administration Sargent, M. (1986) (Vol. 21, p. 67-79, 1986) 13p. **KEYWORDS:** Africa, Gambia, vegetables, onions, cooperative farming, cooperatives, marketing HD1401/A36
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#### **3.E.1.A.BB EXTENSION**

- 2825 **1982 SORGHUM RESEARCH AND EXTENSION VILLAGE APPROACH PROGRAMME IN WESTERN KENYA.** IN: Farming Systems Newsletter Njeru, E.S. (1982) (No.10 p.16-27, July-Sep. 1982) 12p. **KEYWORDS:** Africa, East Africa, Kenya, semiarid zones, sorghum, millets, food production, extension, villages, programs and projects, evaluation KE.3.E.1.A.BB

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- 2833 **MAKING AGRICULTURAL EXTENSION TRAINING PRACTICAL: FROM EVALUATION TO CURRICULUM CHANGE IN SOUTHERN SUDAN.** IN: Agricultural Administration Jones, S. (1985) (Vol.18 p.81-88, 1985) 8p. KEYWORDS: Africa, Sudan, extension, training, evaluation, national programs and projects, institution building, curriculum, educational planning, teacher training, diffusion of information HD1401/.A36
- 2834 **MANUAL OF TEACHING METHODS FOR USE IN AGROFORESTRY INTENSIVE SHORT COURSES.** Major, M. (1985) Turrialba, Costa Rica: Centro Agronómico Tropical de Investigación y Enseñanza (CATIE). (Sponsored by USAID and CATIE) 72p. KEYWORDS: agroforestry, education, teaching methods 3.E.1.A.BB
- 2835 **PERFORMANCE OF AN AGRICULTURAL EXTENSION SERVICE: THE CENTRE DE TRAVAUX OF OULAD SAID.** (Draft) Frissel, M. (1988)\* Settat, Morocco: M. Frissel, MIAC-INRA. 27p. KEYWORDS: Africa, North Africa, Morocco, extension, agricultural production, productivity, evaluation, livestock, cattle, sheep, goats, wheat, barley, cereals, maize, mechanization MA.3.E.1.A.BB

### 3.E.1.B.AA MARKETING

- 2836 **ELEMENTS DE STRATEGIE DE COMMERCIALISATION DES PRODUITS AGRICOLES.** Driouchi, A. (1988)\* [Meknes, Morocco?: A. Driouchi?, Professor, Department D'Economie Rurale, Ecole Nationale D'Agriculture]. (Guide Numero 5 Pour L'Analyse en Economie Rurale; Working Paper, February, 1988; poor photocopy) 21p. KEYWORDS: Africa, North Africa, Morocco, commercial farming, marketing MA.3.E.1.B.AA
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- 2839 **EVALUATION OF THE ARID AND SEMI-ARID LANDS PROJECT.** (Working Draft of paper prepared for the Center for Development Information and Evaluation) Carloni. (1985)\* s.l.: s.n.. (USAID Project No.615-0172) 38p. **KEYWORDS:** Africa, East Africa, Kenya, arid regions, semiarid zones, programs and projects, evaluation, women KE.3.E.2
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- 2842 **IMPACT OF AGRICULTURAL DEVELOPMENT ON A PASTORAL SOCIETY: THE SHUKRIYA OF THE EASTERN SUDAN.** (Report submitted to the U.S. Agency for International Development (USAID)) Salem-Murdock, M. (1979)\* Binghamton, N.Y.: M. Salem-Murdock, State University of New York at Binghamton, Department of Anthropology and Institute for Development Anthropology. 57p. **KEYWORDS:** Africa, Sudan, USAID, agricultural development, semiarid zones, pastoralism, irrigation, pastoral society, animal husbandry, nomads, ethnic groups, socioeconomic analysis, irrigated farming, sorghum, wheat, groundnuts, cotton, women, history, evaluation, national programs and projects SD.3.E.2

- 2843 **INTEGRATED AGRICULTURAL DEVELOPMENT PROJECTS IN SIERRA LEONE – SOME IMPLICATIONS FOR THE FUTURE ADMINISTRATION OF AGRICULTURAL DEVELOPMENT.** IN: Agricultural Administration Cusworth, J (1985) (Vol.18 p.65-79, 1985) 15p. **KEYWORDS:** Africa, Sierra Leone, programs and projects, national programs and projects, evaluation, organization, management, personnel, problem identification, policy, planning, institution building, agricultural development HD1401/.A36
- 2844 **LOW-RESOURCE AGRICULTURE IN AFRICA.** (Draft) Staatz, J.M. (1986)\* East Lansing, Mich.: J.M. Staatz, Michigan State Univ.. (Draft of U.S. Congress Office of Technology Assessment document) 47p. **KEYWORDS:** Africa, sustainability, inputs, small farmers, appropriate technology, organic farming, alternative farming, economic development, food security, environmental factors, constraints AFRICA.3.E.2
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- 2846 **POLITICAL REALITIES OF AFRICAN MANAGEMENT.** (Paper prepared as background material for the AID Workshop on the Evaluation of Management in African Agricultural Development Projects) Leonard, D.K. (1984) Binghamton, N.Y.: Institute for Development Anthropology, 99 Collier St., Suite 302, P.O. Box 818. 39p. **KEYWORDS:** Africa, politics, development policy, agricultural policy, development administration, programs and projects, management, leadership, bureaucracy AFRICA 3.E.2
- 2847 **REPRESENTATIVE FARM MODELING FOR EVALUATION OF NEW TECHNOLOGIES AND ANALYSIS OF AGRICULTURAL POLICIES IN MOROCCO.** Roth, M. [1988]\* Madison, Wisc.: M. Roth, Land Tenure Center, Univ. of Wisconsin. 6p. **KEYWORDS:** Africa, North Africa, Morocco, innovations, technology development, farm models, evaluation, agricultural policy, appropriate technology, technology analysis, pest control, price support, price policy, subsidies MA.3.E.2
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### **3.F TECHNOLOGICAL AND MECHANICAL FACTORS**

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### 3.F.1 MECHANIZATION

- 2855 **AVERAGE SIZED FARM OPERATED BY TRACTOR OWNERS IN ABDA REGION OF SAFI PROVINCE, MOROCCO.** Rafsnider, G. (1987) Settati, Morocco: MidAmerica International Agricultural Consortium-Morocco Project Aridoculture Center. (MIAC Agric. Econ. Info. Rpt. No. 5) 4p. KEYWORDS: Africa, Morocco, Safi province, tractors, MIAC-INRA study, statistics, mechanization, rain-fed farming, farm size, cropping patterns, methodology, land tenure, cereals, legumes, land tenure, technology MA.3.F.1
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- 2857 **FARMING SYSTEMS RESEARCH AND PROJECT IMPLEMENTATION: THE EGYPTIAN/USAID AGRICULTURAL MECHANIZATION PROJECT, A CASE STUDY.** (Paper presented at the Farming Systems Research Seminar, Kansas State University, October 1984) El-Haddad, Z. (1984) s.l.: Z. El-Haddad. 10p. KEYWORDS: Africa, Egypt, project implementation, USAID, Agricultural Mechanization Project, productivity, technology, research, development, extension, service center, village workshop development, land improvement, manufacturing, planning, evaluation, farming systems EG.3.F.1
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- 2867 **FACTORS CONTRIBUTING TO THE RAPID DEVELOPMENT OF SMALL-SCALE IRRIGATION SCHEMES ALONG THE SENEGAL RIVER.** IN: Agricultural Administration van der Laan, E. (1984) (Vol.17 p.203-213, 1984) 11p. **KEYWORDS:** Africa, West Africa, Senegal, rural development, irrigated farming, irrigation systems, technology transfers, farmers' attitudes, land, labor, income, institution building, socioeconomic organization, women in agriculture, food production, rice, innovation adoption, political systems, methodology, small farms HD 1401/A36
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- 3.F.4 APPROPRIATE TECHNOLOGY**
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#### **4      HUMAN ELEMENT: ENDOGENOUS FACTORS (HOUSEHOLD)**

- 2880 **EMPLOYMENT GENERATED BY PROJECTS OF THE CENTRAL TUNISIA DEVELOPMENT AUTHORITY.** Schaefer-Davis, S. (1985) Worcester, Mass.: Clark Univ.. (Cooperative Agreement on Human Settlements and Natural Resource Systems Analysis) 128p. **KEYWORDS:** Africa, North Africa, Tunisia, farmer groups, CTDA projects, families, labor, expenditures, income, livestock, marketing, irrigation, project implementation, business conditions, credit    TN.4
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- 2883 **SOCIO-ECONOMIC FACTORS AFFECTING DECISIONS OF TRADITIONAL FARMER ON INVESTMENT IN LIVESTOCK IN SHARKIA GOVERNORATE.** Soliman, I. (1982) Davis, Calif.: Agricultural Development Systems: Egypt Project, University of California. (Economics Working Paper Series, no.65) 27p. **KEYWORDS:** Africa, Egypt, traditional farming, livestock, investment, land holdings, cropping patterns, family labor, family consumption, education, age, family size, occupation    EG.4
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- 2886 **RISK AS MEDIUM OF DIFFERENTIATION UNDER UNIMODAL DEVELOPMENT STRATEGIES IN THE SEMI-ARID TROPICS OF WEST AFRICA.** (Draft of paper prepared for presentation to the Society for Economic Anthropology, University of California-Riverside, Apr. 3-4, 1987) Carter, M.R. (1987)\* Madison, Wisc.: M.R. Carter, Dept. of Agricultural Economics, Univ. of Wisconsin. 28p. **KEYWORDS:** Africa, West Africa, semiarid tropics, risks, development planning, growth, socioeconomic analysis AFRICA.4.A
- 2887 **RISK BEARING BY SMALL FARMERS IN ABDA REGION OF SAFI PROVINCE, MOROCCO DURING THE 1985-86 CROP YEAR.** Rafsnider, G. (1988) Settat, Morocco: MidAmerica International Agricultural Consortium-Morocco Project Aridoculture Center. (MIAC Agric. Econ. Info. Rpt. No. 9) 5p. **KEYWORDS:** Africa, Morocco, risks, crops, crop production variabilities, methodology, cereals, legumes, land, data MA.4.A

#### **4.B ECONOMIC INPUTS**

- 2888 **COLONIZACIÓN Y DEFORESTACIÓN EN AMÉRICA CENTRAL: DISCUSIÓN SOBRE MATERIAS DE DESARROLLO.** Collins, J.L. (1986) Worcester, Mass.: Clark University and Institute for Development Anthropology, Binghamton, N.Y.. (Cooperative Agreement on Human Settlements and Natural Resource Systems Analysis; Working Paper No.31; also in english, see "Settlement and Deforestation...") 39p. **KEYWORDS:** Latin America, Central America, settlement, deforestation, labor, infrastructure development, policy, land use, land tenure, land tenancy, resource control LATIN AMERICA.4.B
- 2889 **ENTERPRISE BUDGETS FOR CEREALS PRODUCED BY FARMERS WHO OWNED TRACTORS AND OPERATED BETWEEN 10 AND 250 HECTARES IN THE ABDA REGION OF SAFI PROVINCE, MOROCCO DURING THE 1985-86 CROPPING YEAR.** Rafsnider, G. (1987) Lincoln, Neb.: University of Nebraska. (Morocco Dryland Agriculture Applied Research Program under USAID Project No. 608-0136, Agricultural Economics Bulletin Number 1) 21p. **KEYWORDS:** Africa, Morocco, enterprise budgets, cereals, tractors, barley, maize, hard wheat, wheat, technical production, farmer surveys, operating costs, revenues, capital, tillage, fertilization, planting, crop husbandry, harvesting, storage MA.4.B

- 2890 **ENTERPRISE BUDGETS FOR CEREALS PRODUCED BY FARMERS WHO RENTED TRACTOR SERVICES AND OPERATED LESS THAN TEN HECTARES IN THE ABDA REGION OF SAFI PROVINCE, MOROCCO DURING THE 1985-86 CROPPING YEAR.** (Research carried out as part of the Morocco Dryland Agriculture Applied Research Program under USAID Project No.608-0136 Rafsnider, G. (1987) Lincoln, Neb.: G. T. Rafsnider, Assoc. Professor, Univ. of Nebraska and MIAC Agricultural Economist. (Agricultural Economics Bulletin No.5) 13p. KEYWORDS: Africa, North Africa, Morocco, arid regions, evaluation, cereals, barley, maize, wheat, enterprise budgets, surveys--short term, statistical analysis MA.4.B
- 2891 **ENTERPRISE BUDGETS FOR CEREALS PRODUCED BY FARMERS WHO RENTED TRACTOR SERVICES AND OPERATED BETWEEN TEN AND THIRTY HECTARES IN THE ABDA REGION OF SAFI PROVINCE, MOROCCO DURING THE 1985-86 CROPPING YEAR.** Rafsnider, G. (1987) Lincoln, Neb.: University of Nebraska. (Morocco Dryland Agriculture Applied Research Program under USAID Project No. 608-1036, Agricultural Economics Bulletin Number 3) 16p. KEYWORDS: Africa, Morocco, crop enterprise budgets, cereals, tractors, barley, maize, wheat, technical production, production, tillage, planting, crop husbandry, cultivation, harvesting, storage, revenues MA.4.B
- 2892 **ENTERPRISE BUDGETS FOR FOOD LEGUMES PRODUCED BY FARMERS WHO RENTED TRACTOR SERVICES AND OPERATED LESS THAN TEN HECTARES IN THE ABDA REGION OF SAFI PROVINCE, MOROCCO DURING THE 1985-86 CROPPING YEAR.** Rafsnider, G. (1987) Lincoln, Neb.: University of Nebraska. (Morocco Dryland Agriculture Applied Research Program under USAID Project No. 608-0136, Agricultural Economics Bulletin Number 6) 15p. KEYWORDS: Africa, Morocco, crop enterprise budgets, legumes, tractors, chickpeas, faba beans, lentils, peas, technical production, surveys, operating costs, tillage, planting, crop husbandry, cultivation, harvesting, storage, revenues MA.4.B
- 2893 **ENTERPRISE BUDGETS FOR FOOD LEGUMES PRODUCED BY FARMERS WHO RENTED TRACTORS AND OPERATED BETWEEN 10 AND 250 HECTARES IN THE ABDA REGION OF SAFI PROVINCE, MOROCCO DURING THE 1985-86 CROPPING YEAR.** Rafsnider, G. (1987) Lincoln, Neb.: University of Nebraska. (Morocco Dryland Agriculture Applied Research Program under USAID Project No. 608-0136, Agricultural Economics Bulletin Number 2) 21p. KEYWORDS: Africa, Morocco, enterprise budgets, legumes, tractors, chickpeas, faba beans, peas, lentils, technical production, farmer surveys, operating costs, revenues, capital, tillage, cultivation, planting, crop husbandry, harvesting, storage MA.4.B

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- 2895 **GUIDE GENERAL POUR L'EVALUATION DES COUTS DES ANIMAUX ET PRODUITS ANIMAUX.** Driouchi, A. (1988)\* Settlat, Morocco: Centre Regional de la Recherche Agronomique de la Chaouia Abda et Doukkala. (Guide Numero 2 Pour L'Analyse en Economie Rurale; Working Paper, January, 1988; USAID Project No. 608-0136) 35p. KEYWORDS: Africa, North Africa, Morocco, production costs, livestock production, animal products, economic evaluation MA.4.B
- 2896 **GUIDE GENERAL POUR L'EVALUATION DES COUTS DE PRODUCTION DES CULTURES.** Driouchi, A. (1988)\* Settlat, Morocco: Centre Regional de la Recherche Agronomique de la Chaouia Abda et Doukkala. (Guide Numero 1 Pour L'Analyse en Economie Rurale; Working Paper, January, 1988; USAID Project No. 608-0136) 38p. KEYWORDS: Africa, North Africa, Morocco, production costs, crop production, economic evaluation MA.4.B
- 2897 **HOUSEHOLD DYNAMICS AND THE ORGANIZATION OF PRODUCTION IN CENTRAL TUNISIA.** Salem-Murdock, M. (1986) Worcester, Mass.: Clark University. (Cooperative Agreement on Human Settlements and Natural Resource Systems Analysis) 81p. KEYWORDS: Africa, North Africa, Tunisia, households, irrigation, farming systems, labor, agricultural productivity, inter-household research, intra-household research, land, water, capital, livestock, kinship, tribal affiliation, social status, political position, marketing, production strategies TN.4.B
- 2898 **LESOTHO FARMING SYSTEMS: A CLOSER LOOK AT WOMEN FARM MANAGERS AND THE PROBLEMS OF SUBSISTENCE PRODUCTION.** (Paper presented at the Eleventh International Congress of Anthropological and Ethnological Sciences, Vancouver, British Columbia, Aug. 21, 1983) Butler, L.M. (1983)\* Puyallup, Wash.: L.M. Butler, Dept. of Rural Sociology and Extension Anthropology, Washington State Univ.. 21p. KEYWORDS: Africa, Southern Africa, Lesotho, women in agriculture, management, subsistence farming, socioeconomic status, land, labor, animal traction, migration, baseline data LS.4.B

- 2899 **SETTLEMENT AND DEFORESTATION IN CENTRAL AMERICA: A DISCUSSION OF DEVELOPMENT ISSUES.** Collins, J.L. (1986) Worcester, Mass.: Clark University and Institute for Development Anthropology, Binghamton, N.Y.. (Cooperative Agreement on Human Settlements and Natural Resource Systems Analysis; Working Paper No.31; also in spanish, see "Colonización y Deforestación...") 36p. **KEYWORDS:** Latin America, Central America, settlement, deforestation, labor, infrastructure development, policy, land use, land tenure, land tenancy, resource control  
LATIN AMERICA.4.B
- 2900 **SIGNIFICANCE OF DISTANCE CONSTRAINTS IN PEASANT FARMING SYSTEMS - WITH SPECIAL REFERENCE TO SUB-SAHARAN AFRICA.** McCall, M.K. [1985?]\* Enschede, Netherlands: M.K. McCall, Twente University of Technology, Technology and Development Group. 41p. **KEYWORDS:** Africa, farming systems, work studies, time allocation, geography, geographical distribution, distance travelled, constraints, women, labor, planning, settlements, intensification  
AFRICA.4.B
- 2901 **SUMMARY OF THE FOUR PRINCIPAL CEREAL AND FOUR PRINCIPAL FOOD LEGUME PRODUCTION COSTS PER QUINTAL FOR EACH OF THE THREE CLASSES OF FARMERS IN ABDA REGION OF SAFI PROVINCE, MOROCCO DURING THE 1985-86 CROP YEAR.** Rafsnider, G.T. (1988)\* [Settat, Morocco?: G.T. Rafsnider, Assoc. Professor, Univ. of Nebraska and MIAC Agricultural Economist]. (Agricultural Economics Bulletin No. 7; Research carried out as part of the Morocco Dryland Agriculture Applied Research Program under USAID Project No. 608-0136) 14p. **KEYWORDS:** Africa, North Africa, Morocco, cereals, legumes, production costs, food production  
MA.4.B
- 2902 **TRACTOR OWNER OPERATING CAPITAL AND LABOR REQUIREMENTS FOR CEREAL PRODUCTION IN ABDA REGION OF SAFI PROVINCE.** Rafsnider, G. (1987) Settat, Morocco: MidAmerica International Agricultural Consortium-Morocco Project Aridoculture Center. (MIAC Agric. Econ. Info. Rpt. No. 7) 4p. **KEYWORDS:** Africa, Morocco, Safi province, tractors, mechanization, capital, labor, cereal production, technology, dryland agricultural research, tillage, fertilization, planting, crop husbandry, cultivation, harvesting, storage  
MA.4.B
- 2903 **VARIABLE COSTS OF PRODUCTION FOR CEREAL AND FOOD LEGUME CROPS IN ABDA REGION OF SAFI PROVINCE.** Rafsnider, G. 1987\* Settat, Morocco: G. Rafsnider, MIAC-Morocco Project, Aridoculture Center. (MIAC Agric. Econ. Info. Rpt. No.8) 3p. **KEYWORDS:** Africa, Morocco, Safi province, production costs, cereals, legumes, economic analysis  
MA.4.B

#### **4.B.1 LAND**

- 2904 **FACTORS INFLUENCING THE REDUCTION OF MAIZE ACREAGE ON SWAZI NATION LAND.** IN: Agricultural Administration and Extension Sithole, V.M. (1987) (Vol.27 p.201-213, 1987) 13p. **KEYWORDS:** Africa, Swaziland, maize, land tenure, farmers' attitudes, food production, production costs, self sufficiency, national programs and projects, labor, land use, markets, policy HD1401/.A36
- 2905 **LAND TENURE AND TECHNOLOGICAL INNOVATIONS IN THE ETHIOPIAN HIGHLANDS.** (Draft prepared for the ARPT/CIMMYT Workshop on the Role of Rural Sociology in Farming Systems Research, Lusaka, Zambia, Nov. 27-29,1984) Whalen, I.T. (1984)\* s.l.: I.T. Whalen. 14p. **KEYWORDS:** Africa, Ethiopia, land tenure, ILCA, rural organization, land use, appropriate technology, livestock, rural sociology, planning of research, forage crops, problem identification, animal production, mixed farming, cooperatives, peasant farming, innovation adoption ET.4.B.1

#### **4.B.2 LABOR MANAGEMENT**

- 2906 **PROBLEMATIQUE D'UN THEME TECHNIQUE AGRICOLE: LE LABOR DE FIN DE CYCLE AVEC ENFOUISSEMENT DES PAILLES.** (Séminaire sur les technologies combinées dans l'écosystème Sahélien du 4 au 14 Janvier 1977 à Dakar) Faye, J. (1977)\* Bambey, Senegal: J. Faye, Centre National de Recherches Agronomiques. (Delegation Generale a la Recherche Scientifique et Technique 10p. **KEYWORDS:** Africa, Senegal, arid regions, Sahel, problem identification, labor, labor allocation, labor requirements, mechanization, seasonal labor SN.4.B.2

#### **4.C ECONOMIC OUTPUT**

- 2907 **SOCIO-ECONOMIC DETERMINANTS OF FOOD CONSUMPTION AND PRODUCTION IN RURAL SIERRA LEONE: APPLICATION OF AN AGRICULTURAL HOUSEHOLD MODEL WITH SEVERAL COMMODITIES.** Strauss, J (1983) East Lansing, Mich.: Michigan State University, Department of Agricultural Economics. (MSU International Development Paper No. 5, 1983) 91p. **KEYWORDS:** Africa, Sierra Leone, food consumption, households, nutrition, sociology, demand, production, household consumption, models, income, commodities SL.4.C

#### **4.C.2 FOOD**

- 2908 **RAINY SEASON FOOD CONSUMPTION SURVEY IN THE MIDDLE VALLEY BETWEEN PODOR AND MATAM, SENEGAL.** IN: Farming Systems Research Along the Senegal River Valley Stone, P. (1987) Tucson, Ariz.: University of Arizona, College of Agriculture, Office of Arid Lands Study. (Report No.2, Jan. 1987; Senegal Agricultural Research Project II) 70p. **KEYWORDS:** Africa, Senegal, USAID, food, food consumption, food preferences, food distribution and marketing, seasonality, food storage, gathering, women in agriculture, surveys, food habits, socioeconomic organization, arid regions ++

#### **5 FARMING SYSTEMS RESEARCH METHODOLOGY**

- 2909 **1986 GAMBIA/WEST AFRICA FARMING SYSTEMS RESEARCH/ EXTENSION (FSR/E) WORKSHOP: DIAGNOSIS, DESIGN AND ANALYSIS.** Caldwell, J. (1986)\* Blacksburg, Va.: J. Caldwell, Virginia Polytechnic Institute and State University. 26p. **KEYWORDS:** Africa, West Africa, Gambia, extension, surveys, sondeos, problem identification, project design, programs and projects, analysis, training, agricultural research, planning of research, models GM.5
- 2910 **AGRICULTURAL SYSTEMS RESEARCH: WHAT IS IT AND WILL IT INCREASE SUSTAINABILITY?.** (Lecture presented in Issues in Agricultural and Life Sciences Spring Lecture Series, College of Agricultural and Life Sciences, Univ. of Wisconsin, Madison, Wisconsin, Apr. 7, 1988) Francis, C.A. (1988) Lincoln, Neb.: Univ. of Nebraska, Cooperative Extension Service, Institute of Agriculture and Natural Resources, Dept. of Agronomy. 12p. **KEYWORDS:** sustainability, research, farming systems theory, methodology, technology, extension, information exchange 5
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- 2912 **CONTRIBUTION Á L'ÉTUDE DES SYSTÈMES DE PRODUCTION EN RÉPUBLIQUE CENTRAFRICAINE: FAISABILITÉ DE L'INTRODUCTION DE LA MOTORISATION INTERMÉDIAIRE SUR UNE EXPLOITATION.** IN: Cotton et Fibres Tropicales Dubernard, J. (1981) (Vol.36 fasc.3, p.209-25, 1981) 17p. **KEYWORDS:** Africa, Central African Republic, mechanization, cropping systems, crop production, cotton, maize, groundnuts, rice, management, production costs, cash flows CF.5
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