Crop Livestock Systems In Northern Ghana Le Hub Rural

Cover crops slow erosion, improve soil, smother weeds, enhance nutrient and moisture availability, help control many pests and bring a host of other benefits to your farm. At the same time, they can reduce costs, increase profits and even create new sources of income. You¿ll reap dividends on your cover crop investments for years, since their benefits accumulate over the long term. This book will help you find which ones are right for you. Captures farmer and other research results from the past ten years. The authors verified the info. from the 2nd ed., added new results and updated farmer profiles and research data, and added 2 chap. Includes maps and charts, detailed narratives about individual cover crop species, and chap. about aspects of cover cropping.
While a good grasp of the many separate aspects of agriculture is important, it is equally essential for all those involved in agriculture to understand the functioning of the farming system as a whole and how it can be best managed. It is necessary to re-assess and understand rain-fed farming systems around the world and to find ways to improve the selection, design and operation of such systems for long term productivity, profitability and sustainability. The components of the system must operate together efficiently; yet many of the relationships and interactions are not clearly understood. Appreciation of these matters and how they are affected by external influences or inputs are important for decision making and for achieving desirable outcomes for the farm as a whole. This book analyses common rain-fed farming systems and defines the principles and practices important to their effective functioning and management.
Communal grazing lands are important sources of feed in developing countries. The uncontrolled and free grazing system prevalent in many developing countries has caused sever degradation of the grazing lands. Several alternative management options have been recommended to solve the degradation of common property resources, including state ownership, imposition and enforcement of use rules and regulations by external organisations such as the government, private ownership and community resource management. This paper examines the nature and determinants of collective action for grazing land management in the highlands of Tigray, northern Ethiopia.
Farm Management in Mixed Crop-livestock Systems in the Northern Highlands of EthiopiaGrain Legume Fodders as Ruminant Feed in Mixed Crop-livestock Systems in Northern Ghana
"The assessment builds on the work of the Livestock, Environment and Development (LEAD) Initiative"--Pref.
From climate change to farming systems to genetic modification of organisms, Crop Physiology, Second Edition provides a practical tool for understanding the relationships and challenges of successful cropping. With a focus on genetic improvement and agronomy, this book addresses the challenges of environmentally sound production of bulk and quality food, fodder, fiber, and energy which are of ongoing international concern. The second edition of Crop Physiology continues to provide a unique analysis of these topics while reflecting important changes and advances in the relevant science and implementation systems.
Contemporary agriculture confronts the challenge of increasing demand in terms of quantitative and qualitative production targets.

These targets have to be achieved against the background of soil and water scarcity, worldwide and regional shifts in the patterns of land use driven by both climate change and the need to develop crop-based sources of energy, and the environmental and social aspects of agricultural sustainability. Provides a view of crop physiology as an active source of methods, theories, ideas, and tools for application in genetic improvement and agronomy Written by leading scientists from around the world Combines environment-specific cropping systems and general principles of crop science to appeal to advanced students, and scientists in agriculture-related disciplines, from molecular sciences to natural resources management

A joint FAO and World Bank study which shows how the farming systems approach can be used to identify priorities for the reduction of hunger and poverty in the main farming systems of the six major developing regions of the world.

The State of the World's Land and Water Resources for Food and Agriculture is FAO's first flagship publication on the global status of land and water resources. It is an 'advocacy' report, to be published every three to five years, and targeted at senior level decision makers in agriculture as well as in other sectors. SOLAW is aimed at sensitizing its target audience on the status of land resources at global and regional levels and FAO's viewpoint on appropriate recommendations for policy formulation. SOLAW focuses on these key dimensions of analysis: (i) quantity, quality of land and water resources, (ii) the rate of use and sustainable management of these resources in the context of relevant socio-economic driving factors and concerns, including food security and poverty, and climate change. This is the first time that a global, baseline status report on land and water resources has been made. It is based on several global spatial databases (e.g. land suitability for agriculture, land use and management, land and water degradation and depletion) for which FAO is the world-recognized data source. Topical and emerging issues on land and water are dealt with in an integrated rather than sectoral manner. The implications of the status and trends are used to advocate remedial interventions which are tailored to major farming systems within different geographic regions.

At a time when food is becoming increasingly scarce in many parts of the world and food prices are skyrocketing, no industry is more important than agriculture. Humans have been farming for thousands of years, and yet agriculture has undergone more fundamental changes in the past 80 years than in the previous several centuries. In 1900, 30 million American farmers tilled the soil or tended livestock; today there are fewer than 4.5 million farmers who feed a population four times larger than it was at the beginning of the century. Fifty years ago, the planet could not have sustained a population of 6.5 billion; now, commercial and industrial agriculture ensure that millions will not die from starvation. Farmers are able to feed an exponentially growing planet because the greatest industrial revolution in history has occurred in agriculture since 1929, with U.S. farmers leading the way. Productivity on American farms has increased tenfold, even as most small farmers and tenants have been forced to find other work. Today, only 300,000 farms produce approximately ninety percent of the total output, and overproduction, largely subsidized by government programs and policies, has become the hallmark of modern agriculture. A Revolution Down on the Farm: The Transformation of American Agriculture since 1929 charts the profound changes in farming that have occurred during author Paul K. Conkin's lifetime. His personal experiences growing up on a small Tennessee farm complement compelling statistical data as

he explores America's vast agricultural transformation and considers its social, political, and economic consequences. He examines the history of American agriculture, showing how New Deal innovations evolved into convoluted commodity programs following World War II. Conkin assesses the skills, new technologies, and government policies that helped transform farming in America and suggests how new legislation might affect farming in decades to come. Although the increased production and mechanization of farming has been an economic success story for Americans, the costs are becoming increasingly apparent. Small farmers are put out of business when they cannot compete with giant, non-diversified corporate farms. Caged chickens and hogs in factory-like facilities or confined dairy cattle require massive amounts of chemicals and hormones ultimately ingested by consumers. Fertilizers, new organic chemicals, manure disposal, and genetically modified seeds have introduced environmental problems that are still being discovered. A Revolution Down on the Farm concludes with an evaluation of farming in the twenty-first century and a distinctive meditation on alternatives to our present large scale, mechanized, subsidized, and fossil fuel and chemically dependent system.

This book is a printed edition of the Special Issue "Environmentally Sustainable Livestock Production" that was published in Sustainability

Greenhouse gas emissions by the livestock sector could be cut by as much as 30 percent through the wider use of existing best practices and technologies. FAO conducted a detailed analysis of GHG emissions at multiple stages of various livestock supply chains, including the production and transport of animal feed, on-farm energy use, emissions from animal digestion and manure decay, as well as the post-slaughter transport, refrigeration and packaging of animal products. This report represents the most comprehensive estimate made to-date of livestocks contribution to global warming as well as the sectors potential to help tackle the problem. This publication is aimed at professionals in food and agriculture as well as policy makers.

Grain legumes are important crops in the mixed crop-livestock (MCL) systems in Africa because they provide food and cash for humans, fodder for animals and they improve soil fertility through biological nitrogen fixation. The residues of grain legumes, also known as grain legume fodders (GLFs), have better nutritional quality than cereal residues, such as maize and rice straw. Besides their function as livestock feed, GLFs supply fuel, construction material and mulch for soil improvement. However, knowledge about factors that drive the diversity of use of GLFs in different farming systems is limited. Therefore, the objective of this thesis was to understand the roles of grain legume fodders in mixed crop-livestock systems and identify options to improve their quality and utilisation by smallholders in northern Ghana. To achieve this objective, we conducted four multi-disciplinary studies. First, we assessed and described the variation in the use of GLFs to understand their impacts on MCL systems. Second, we evaluated and compared the effects of rhizobium inoculation and phosphorus fertilization on grain and fodder yield and fodder quality of the major grain legumes in two agro-ecological zones. Third, we evaluated the effects of storage conditions and duration on dry matter loss and nutritional quality of GLFs and to risk of aflatoxin formation in stored fodder. Lastly, we assessed the nutritional quality of stored GLFs using different quality assessment methods. Results show there is variation in the use of GLFs in the study regions in

northern Ghana. For example, in Upper East region, most of the GLFs (87%) was stall-fed, whereas in Upper West region GLFs were for a considerable extent (61%), left on the field and used for mulching. In Northern region, both stall-feeding and grazing of GLFs was important. In our agronomic studies we found that rhizobium inoculation of cowpea seed, for example, increased grain yield by 44%, P-fertilization increased grain yield by 102% while the combination of P and inoculation increased grain yield by 123% compared to the control treatment where no input was applied. In the storage experiment, we found that dry matter loss during storage for 120 days was on average 24% across all storage conditions, 35% for the worst condition (tied in bundles and stored on roofs or tree-forks) and 14% for the best condition (sacks and in rooms). During storage, the CP content and OMD decreased, and the content of cell wall components increased. Aflatoxins were not detected in stored GLFs. Finally, in fodder quality assessment studies, all the four methods used (farmers' perception, sheep preference, leaf-to-stem ratio and laboratory analyses) successfully discriminated GLF quality between crops. Only farmers and sheep could distinguish quality differences among storage conditions, whereas laboratory assessment methods could not. In general we concluded that with increasing importance of livestock in intensified MCL systems, GLFs become more important and more valuable for feeding, especially in the dry season. For this reason smallholder farmers can increased both grain and fodder yield of grain legumes concurrently through the use of rhizobium inoculation and P-fertilization. They can also reduce GLF nutritional quality and dry matter quantity loss by adopting appropriate fodder storage methods. The absence of aflatoxin in the groundnut fodder samples indicated that there is minimal risk of aflatoxin development when stored under dry conditions as in our study. Finally, farmers' experience and local knowledge in feeding GLFs to livestock is valuable in determining the quality of GLFs and preference of their animals.

Impact of chemoprophylactic control of trypanosomosis in coastal Kenya; Economic impact of N'Dama cattle in tsetse-affected areas of Zaire, Togo, Ethiopia and The Gambia; Adoption of dairy feeding management in the Ethiopian highlands; Costs and benefits of alternative theileriosis control strategies in Zimbabwe; Impacts of east coast fever immunisation in coastal and highland Kenya; Fodder bank adoption in northern Nigeria; Impact of land tenure on adoption of alley farming in West Africa; Impact of crossbred dairy-draft technology in Ethiopia; Impact of livestock on alley farming systems in West Africa; Impact of dairy intensification on Africa peri-urban milk production systems; Constraints to use of animal traction in semi-arid West Africa; Impacts of dairy intensification on nutrition and health in coastal Kenya; Economic impact of theileriosis and its control in Africa.

Why model? Agricultural system models enhance and extend field research...to synthesize and examine experiment data and advance our knowledge faster, to extend current research in time to predict best management systems, and to prepare for climate-change effects on agriculture. The relevance of such models depends on their implementation. Methods of Introducing System Models into Agricultural Research is the ultimate handbook for field scientists and other model users in the proper methods of model use. Readers will learn parameter estimation, calibration, validation, and extension of experimental results to other weather conditions, soils, and climates. The proper methods are the key to realizing the great potential benefits of modeling an agricultural system. Experts cover the major models, with the synthesis of knowledge that is the hallmark of the Advances in Agricultural Systems Modeling series.

In the last 20 years, there has been a remarkable emergence of innovations and technological advances that are generating promising

changes and opportunities for sustainable agriculture, yet at the same time the agricultural sector worldwide faces numerous daunting challenges. Not only is the agricultural sector expected to produce adequate food, fiber, and feed, and contribute to biofuels to meet the needs of a rising global population, it is expected to do so under increasingly scarce natural resources and climate change. Growing awareness of the unintended impacts associated with some agricultural production practices has led to heightened societal expectations for improved environmental, community, labor, and animal welfare standards in agriculture. Toward Sustainable Agricultural Systems in the 21st Century assesses the scientific evidence for the strengths and weaknesses of different production, marketing, and policy approaches for improving and reducing the costs and unintended consequences of agricultural production. It discusses the principles underlying farming systems and practices that could improve the sustainability. It also explores how those lessons learned could be applied to agriculture in different regional and international settings, with an emphasis on sub-Saharan Africa. By focusing on a systems approach to improving the sustainability of U.S. agriculture, this book can have a profound impact on the development and implementation of sustainable farming systems. Toward Sustainable Agricultural Systems in the 21st Century serves as a valuable resource for policy makers, farmers, experts in food production and agribusiness, and federal regulatory agencies.

This book is open access under a CC BY-NC-SA 3.0 IGO license. The book uses an economic lens to identify the main features of climate-smart agriculture (CSA), its likely impact, and the challenges associated with its implementation. Drawing upon theory and concepts from agricultural development, institutional, and resource economics, this book expands and formalizes the conceptual foundations of CSA. Focusing on the adaptation/resilience dimension of CSA, the text embraces a mixture of conceptual analyses, including theory, empirical and policy analysis, and case studies, to look at adaptation and resilience through three possible avenues: ex-ante reduction of vulnerability, increasing adaptive capacity, and ex-post risk coping. The book is divided into three sections. The first section provides conceptual framing, giving an overview of the CSA concept and grounding it in core economic principles. The second section is devoted to a set of case studies illustrating the economic basis of CSA in terms of reducing vulnerability, increasing adaptive capacity and ex-post risk coping. The final section addresses policy issues related to climate change. Providing information on this new and important field in an approachable way, this book helps make sense of CSA and fills intellectual and policy gaps by defining the concept and placing it within an economic decision-making framework. This book will be of interest to agricultural, environmental, and natural resource economists, development economists, and scholars of development studies, climate change, and agriculture. It will also appeal to policy-makers, development practitioners, and members of governmental and non-governmental organizations interested in agriculture, food security and climate change.

Since adoption is a dynamic process that involves learning about new technologies, static adoption models fail to adequately explore the effects of changes in farmers' perception and attitudes over time. This study analyzed the influences of farmers' learning and risk on the likelihood and intensity of adoption of improved tef and wheat technologies in Northern and Western Shewa zones of Ethiopia. The study employed Xtprobit and Xttobit and random effect models and panel data of the same farmers from 1997 to 2001. Separate samples were selected for wheat and tef and the study covers the same farmers from 1997-2001. Panel data are better suited to study dynamic changes and the random effect models control for unobserved variability and potential endogeniety. Comparison of the main features of tef and wheat farmers revealed that wheat farmers are slightly younger, more educated, have slightly higher family size and significantly higher family labour than tef farmers. While average farm size is similar for tef and wheat farmers, farmers cultivated 60% and 30% of their land to tef and wheat, respectively. However, tef farmers allocated only 20% of their tef area to improved varieties due to shortage of desirable varieties

whereas wheat farmers allocated 90% of their land to improved varieties from 1997 to 2001. Only three improved varieties were demonstrated and limited quantities of improved seeds were distributed to tef farmers whereas six improved wheat varieties were demonstrated and relatively sufficient quantities of improved seeds were distributed to wheat farmers during the study. Besides, similar levels of fertilizers and herbicide were used on tef and wheat. Wheat and tef were mainly grown for own consumption as less than half of the produce (48% of all wheat and 46% of all tef) was sold in the market. The study provided evidence of the importance of learning in the adoption decision and area allocation to improved varieties. As farmer's gained more experience from growing the new varieties in previous years, they continued adoption and increased areas under these varieties. The study also revealed that adopters of wheat and tef technologies have increased their production by 20% and 39%, respectively, than non-adopters. Results of the analyses indicate that awareness, availability and profitability of the new improved tef and wheat varieties enhanced farmer's learning and farmer's experience had positive influence on the likelihood and intensity of improved seed adoption. Improved tef and wheat varieties were found more risky than the local varieties. The study further revealed that younger age of farmer, farmers' learning from previous experience, availability of family labour and credit are key determinants of the likelihood and intensity of adoption of improved seed. Policies and strategies that contribute to timely availability of improved inputs and provision of credit enhance farmers learning from their own experience on adoption. Policies and strategies that focus on farmers' education and provision of insurance for crop failure to reduce risk would help the new extension program (NEP) achieve its objectives which give emphasis to raising smallholders' production and productivity.

Unless action is taken now to make agriculture more sustainable, productive and resilient, climate change impacts will seriously compromise food production in countries and regions that are already highly food-insecure. The Paris Agreement, adopted in December 2015, represents a new beginning in the global effort to stabilize the climate before it is too late. It recognizes the importance of food security in the international response to climate change, as reflected by many countries prominent focus on the agriculture sector in their planned contributions to adaptation and mitigation. To help put those plans into action, this report identifies strategies, financing opportunities, and data and information needs. It also describes transformative policies and institutions that can overcome barriers to implementation. The State of Food and Agriculture is produced annually. Each edition contains an overview of the current global agricultural situation, as well as more in-depth coverage of a topical theme."

Agro-Ecosystem Diversity: Impact on Food Security and Environmental Quality presents cutting-edge exploration of developing novel farming systems and introduces landscape ecology to agronomy. It encompasses the broad range of links between agricultural development and ecological impact and how to limit the potential negative results. Presented in seven sections, each focusing on a specific challenge to sustaining diversity, the book provides insights toward the argument that by re-introducing diversity, it should be possible to maintain a high level of productivity of agro-ecosystems while also maintaining and/or restoring a satisfactory level of environment quality and biodiversity. Demonstrates that diversified agro-ecosystems can be intensified with environmental quality preserved, restored and enhanced Includes analysis of economic constraints leading to specialization of farms and regions and the social locking forces resisting to diversification of agro-ecosystems Presents a global vision of world agriculture and the tradeoff between a necessary increase in food production and restoring environment quality

Focusing on the different types of grassland farming and their impact on the environment, this book addresses issues facing

environmental quality, namely soil, water and air quality and socioeconomic impacts. It also offers a commentary on how the different pastoral sectors influence environmental issues.

This review describes a range of physical and socio-economic scientific methods and field activities that will be implemented in a proposed research project to develop a better understanding of the extent and patterns of flooding and the potential of flood-recession agriculture. These activities will allow the hydrological characteristics of the river to be matched to crop-livestock systems of flood recession agriculture that are well suited to the study communities and their organizational and institutional frameworks in order to support sustainable growth of such systems. This detailed study will provide recommendations on the technical, economic, institutional and policy measures needed to achieve sustainable intensification of flood recession agriculture in northern Ghana, while complementing efforts undertaken to promote other types of water management systems. Options for out-scaling of flood recession agriculture beyond the study area to other suitable areas will also be explored. The expectation is that the proposed project will improve food security by enhancing knowledge on effective flood recession practices, enhance rural incomes through expanded dry-season farming with new opportunities for rural employment, and improve adaptation to climate change by building more resilient farming communities. To achieve these expected outcomes, proactive policies that clearly identify flood recession agriculture as an alternative farming practice and provide institutional mandates to irrigation support services to promote it through training, demonstration, and outreach programs will be equally valuable.

Informed livestock sector policy development and priority setting is heavily dependent on a good understanding of livestock production systems. In a collaborative effort between the Food and Agriculture Organization and the International Livestock Research Institute, stock has been taken of where we have come from in agricultural systems classification and mapping; the current state of the art; and the directions in which research and data collection efforts need to take in the future. The book also addresses issues relating to the intensity and scale of production, moving from what is done to how it is done. The intensification of production is an area of particular importance, for it is in the intensive systems that changes are occurring most rapidly and where most information is needed on the implications that intensification of production may have for livelihoods, poverty alleviation, animal diseases, public health and environmental outcomes. A series of case studies is provided, linking livestock production systems to rural livelihoods and poverty and examples of the application of livestock production system maps are drawn from livestock production, now and in the future; livestock's impact on the global environment; animal and public health; and livestock and livelihoods. This book provides a formal reference to Version 5 of the global livestock production systems map, and to revised estimates of the numbers of rural poor livestock keepers, by country and livestock production system.

The focus of this book is future global climate change and its implications for agricultural systems which are the main sources of agricultural goods and services provided to society. These systems are either based on crop or livestock production, or on combinations of the two, with characteristics that differ between regions and between levels of management intensity. In turn, they also differ in their sensitivity to projected future changes in climate, and improvements to increase climate-resilience need to be

tailored to the specific needs of each system. The book will bring together a series of chapters that provide scientific insights to possible implications of projected climate changes for different important types of crop and livestock systems, and a discussion of options for adaptive and mitigative management.

The Ghana Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) Baseline Evaluation Survey (GARBES) survey was implemented from May to July 2014 as part of IFPRI's Monitoring and Evaluation (M&E) of Africa RISING. Africa RISING aims to create opportunities for smallholder farmers in Africa south of the Sahara (through action research and development partnerships) by sustainably intensifying their farming systems and improving food, nutrition, and income security. Initiated in 2012, the program is supported by the United States Agency for International Development (USAID) as part of the U.S. government's Feed the Future (FTF) initiative. The International Institute of Tropical Agriculture (IITA) leads a sustainable intensification effort focusing on the cereal-based farming systems in the Guinea Savannah Zone of West Africa (Ghana and Mali) and East and Southern Africa (Malawi, Tanzania, and Zambia) while the International Livestock Research Institute (ILRI) leads the research activities focusing on the crop-livestock systems of the Ethiopian highlands. The International Food Policy Research Institute (IFPRI) has been tasked with M&E of the three projects. Ghana Africa RISING is being implemented in Northern, Upper East, and Upper West regions of Ghana, within the FTF Zones of Influence. The research activities are led by IITA and Wageningen University (WUR). GARBES collected detailed household- and plot-crop level data addressing various topics: employment (agricultural and non-agricultural); health; agricultural land; crop inputs, harvest, storage, and sale; livestock ownership, feed, and water; agriculture-related challenges and coping strategies; credit and off-farm income sources; housing condition and ownership of various durable assets; subjective welfare and food security; household-level food consumption; non-food expenditure; agricultural shocks; and child and women anthropometry. The community survey collected data on access to basic services; extension services; social organizations, mobility, and village-level shocks; access to natural resources; metric conversion units; and prices of crops and food items. GARBES covered 1,284 households and 50 communities drawn from the three project regions. Data were collected using structured questionnaires in multiple local languages through Computer Assisted Personal Interviewing (using SurveyCTO).

This dissertation focuses on the scientific quantification of environmental impacts of agricultural management to understand the life cycle of a cradle-to-field-gate production system. Agricultural systems must include efficient land use, economic resources, and reduce environmental impacts to meet sustainable food production goals. Anthropogenic activity has a significant and on-going impact on agroecosystems. The growing global food demand, grain and meat yields, residue and land use, and resource limitations have a significant role in increasing ecosystem service impacts. The general hypothesis is that a business-as-usual (BAU) scenario is not a sustainable agricultural production system. The objective of this research is to understand environmental burdens in the agricultural sytem of the northern Great Plains (NGP) using life cycle assessment (LCA). Three phases of studies are included: 1) agronomy, 2) livestock, and 3) integrated crop livestock system (ICL) within no-till farm practices of NGP.

This book documents a unique series of 19 case studies where agricultural biotechnologies were used to serve the needs of smallholders in developing countries. They cover different regions, production systems, species and underlying socio-economic conditions in the crop (seven case studies), livestock (seven) and aquaculture/fisheries (five) sectors. Most of the case studies involve a single crop, livestock or fish species and a single biotechnology. Prepared by scientists and researchers who were directly involved in the initiatives, the authors were able to provide an insider's guide to the background, achievements, obstacles, challenges and lessons learned from each case study.