

Agricultural Biodiversity In Smallholder Farms Of East Africa

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Explore the crucial significance of agricultural biodiversity within smallholder farms across East Africa. This vital crop diversity is fundamental for enhancing food resilience, safeguarding traditional farming practices, and enabling communities to adapt to environmental challenges. Understanding and supporting these diverse farm systems is key to sustainable development and East Africa's long-term ecological and economic well-being.

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Agricultural Biodiversity in Smallholder Farms of East Africa

The rich biodiversity of plants found in smallholder farms in Africa helps support communities by producing a range of resources from medicines to construction materials. These farms are often the guardians, as well as the beneficiaries of a greater diversity of biological species than can be found in protected areas. This publication discusses how the smallholder farmers of East Africa, in Kenya, Tanzania and Uganda, are contributing to the global agenda for the conservation, sustainable use and equitable sharing of the benefits of biodiversity.

Agrobiodiversity - a training manual for farmer groups in East Africa

Farmers play a crucial role in the preservation and sustainable use of agrobiodiversity. In fact, the diversity of species that support our current agricultural production systems has been carefully managed and shaped by farming communities, over the course of the history of humankind. Farmers act as custodian of the Earth's agrobiodiversity resources, and play a big part in preserving traditional plant and animal varieties, and the knowledge associated with these. FAO has long been working on promoting approaches to agriculture that enable both the sustainable use of biodiversity resources for food and agriculture, and their conservation, and on supporting farmers to make informed decisions on their farm management and production practices. This training manual fits in this broader commitment, to support a shift towards a paradigm of agricultural production that can sustain food and nutrition security while at the same time cause the least harm to natural ecosystems. The manual is intended as an introduction to agricultural biodiversity, and to its relevance to different aspects of agricultural production and management for smallholder farmers in Kenya. It includes eight different training modules, each covering a specific aspect related to agrobiodiversity. The modules are standalone and

can be used independently one from the other, depending on the user's or project's aim. The materials were originally prepared within the FAO- Netherlands Partnership Programme (FNPP) and have been updated, revised and published under the second phase of the European Union-funded project "Capacity-building related to multilateral environmental agreements (MEAs) in Africa, Caribbean and Pacific (ACP) countries".

Promising Crop Biotechnologies for Smallholder Farmers in East Africa: Bananas and Maize

African agriculture faces major challenges with growing population pressure and the impact of climate change. Until now food production overall has broadly kept pace with demand. To maintain this impressive achievement, production from the land needs to be intensified, soil fertility must be enhanced, forests and water resources must be conserved, and land use practices must be sustainable over the long term. This book shows what needs to be done, and points to how best to achieve this. The book starts with a brief guide to what plants and animals need to grow well, how farmers currently use the land, and the research that is being conducted on new agricultural technologies. A comparison is made of productivity on small and large farms, which demonstrates that, contrary to some suggestions, small farmers, properly serviced, can be as productive or even more productive than larger farms. Subsequent chapters discuss issues of land tenure, pastoralism, training, the importance of women farmers, access to finance, markets, value chains, and contract farming as a partnership between small-scale producers, processors and traders in agricultural products. The final section of the book discusses whether a new "green revolution" is feasible or desirable for Africa. The potential risks and benefits of dependence on purchased agrochemicals, genetically modified varieties, and multinational seed and chemical companies are examined. A series of twelve broad policy proposals for achieving a sustainable agriculture sector is presented for consideration. Fifteen case studies illustrate the issues discussed in the book. Most of the examples are from East Africa, particularly Tanzania, but the principles addressed are relevant across the African continent. Each chapter of the book includes references and suggestions for further reading, most of them freely available to anyone with internet access. A set of essay questions exploring the issues covered in each chapter is included, to provide practical help for students of agriculture and their teachers.

Increasing Production from the Land

Describes how farmers manage, maintain, and benefit from biodiversity in agricultural production systems. Includes the most recent research and developments in the maintenance of local diversity at the genetic, species, and ecosystem levels.

Managing Biodiversity in Agricultural Ecosystems

Deforestation, overgrazing, and unsustainable methods of cultivation are threatening agriculture and food security in the highlands of East Africa. In response, economists and other development professionals have turned their attention to combating the pr

Plant Genetic Resources for Food and Agriculture in Eastern and Central Africa

This report summarizes the state of biodiversity for food and agriculture in Near East and North Africa based on the information provided in country reports submitted to FAO as part of the reporting process for The State of the World's Biodiversity for Food and Agriculture.

Strategies for Sustainable Land Management in the East African Highlands

Agricultural extension / Agroforestry / Farmers' associations / Non-governmental organizations / Fertilizers / Soil fertility / Water storage / Pitcher irrigation / Spate irrigation / Sugarcane / Bunds / Cropping systems / Ridging / Tillage / Terraces / Water harvesting / Water conservation / Soil conservation

Hunger and poverty: the role of biodiversity

This 32-chapter volume represents the core of several oral and poster presentations made at the conference. In addition to Introduction and Conclusion sections, the book is thematically divided into 7 sections, namely, 1) Land Use and Farming Systems, 2) Effects of Climate Change on Crop Yield, 3) Soil Nutrient and Water Management for Carbon Sequestration, 4) Rehabilitation of Degraded Lands through Forestry and Agroforestry, 5) Management of Animal Production for Greenhouse Gas Emissions, 6) Smallholder Adaptation to Climate Change, and 7) Economic, Social and Policy Issues.

It addresses these themes in the context of sustainable intensification (SI). It implies increasing agronomic production from the existing land while improving/restoring its quality and decreasing the C or environmental footprint. Simply put, SI means producing more from less.

Cassava and Soil Fertility in Intensifying Smallholder Farming Systems of East Africa

Soils are critical to agriculture and, in turn, to food supply and livelihoods. Sustainable management of soils is crucial for a large proportion of the population of Africa. Contrary to many claims, soil fertility is improved and managed successfully by small-scale farmers there. Careful studies from widely different areas reveal how closely bound up soil management is with complex social, cultural and ecological factors - requiring a far more subtly tuned approach to development policy and practice. This work is a study of how the context of livelihood systems has to inform development policy and practice.

Near East and North Africa Regional Synthesis for The State of the World's Biodiversity for Food and Agriculture

Small farmers are often viewed as engaging in wasteful practices that wreak ecological havoc. Exploring Agrodiversity sets the record straight: Small farmers are in fact ingenious and inventive and engage in a diverse range of land-management strategies, many of them resourcefully geared toward conserving resources, especially soil. They have shown considerable resilience in the face of major onslaughts against their way of life by outsiders and government. Using case studies from Africa, Asia, Latin America, and the Pacific, this book provides in-depth analysis of agricultural diversity and explores its history. The book also considers the effect of the "gene revolution" on small farmers and reviews the effects of the "green revolution" in Asian countries. In conclusion, it questions whether the diverse agricultural practices employed by small farmers can survive modern pressures and the global ambitions of the biotechnology industry.

Overview of water and soil nutrient management under smallholder rain-fed agriculture in East Africa

Although food-production systems for the world's rural poor typically have had devastating effects on the planet's wealth of genes, species, and ecosystems, that need not be the case in the future. In *Ecoagriculture*, two of the world's leading experts on conservation and development examine the idea that agricultural landscapes can be designed more creatively to take the needs of human populations into account while also protecting, or even enhancing, biodiversity. They present a thorough overview of the innovative concept of "ecoagriculture" - the management of landscapes for both the production of food and the conservation of wild biodiversity. The book examines the global impact of agriculture on wild biodiversity, describes the challenge of reconciling biodiversity conservation and agricultural goals, outlines and discusses the ecoagriculture approach, presents diverse case studies that illustrate key strategies, explores how policies, markets, and institutions can be re-shaped to support ecoagriculture. While focusing on tropical regions of the developing world -- where increased agricultural productivity is most vital for food security, poverty reduction, and sustainable development, and where so much of the world's wild biodiversity is threatened -- it also draws on lessons learned in developed countries. Dozens of examples from around the world present proven strategies for small-scale, low-income farmers involved in commercial production. *Ecoagriculture* explores new approaches to agricultural production that complement natural environments, enhance ecosystem function, and improve rural livelihoods. It features a wealth of real-world case studies that demonstrate the applicability of the ideas discussed and how the principles can be applied, and is an important new work for policymakers, students, researchers, and anyone concerned with conserving biodiversity while sustaining human populations.

Sustainable Intensification to Advance Food Security and Enhance Climate Resilience in Africa

The Atlas of African Agriculture Research & Development is a multifaceted resource that highlights the ubiquitous nature of smallholder agriculture in Africa; the many factors shaping the location, nature, and performance of agricultural enterprises; and the strong interdependencies among farming, natural resource stocks and flows, rural infrastructure, and the well-being of the poor.

Dynamics and Diversity

Pulses have a long history in sub-Saharan Africa due to their multiple benefits. Pulses, and legumes in general, can play an important role in agriculture because of their ability to biologically fix atmospheric

nitrogen and to enhance the biological turnover of phosphorus; thus they could become the cornerstone of sustainable agriculture in Africa. In this sense, there is a body of literature that points to diversification of existing production systems – particularly legumes species, which provide critical environmental services, including soil erosion control and soil nutrient recapitalization. This publication is a review of some of the promising strategies to support the cultivation and utilization of pulses on smallholder farms in sub-Saharan Africa. The review is part of the legacy of the International Year of Pulses (IYP), which sought to recognize the contribution that pulses make to human well-being and the environment.

Exploring Agrodiversity

'This volume on interdisciplinary work in mountain areas is an excellent compilation of examples as well as lessons learned. In effect it provides guidance on how best to approach such work. While different in training and backgrounds the [authors] clearly articulate the global conviction that interdisciplinary work is the only approach. This volume of case studies repeats this strong and important message.' Nikita Lopoukhine Chair of the IUCN World Commission on Protected Areas and former Director General of National Parks Canada 'Over the past twenty years the rhetoric surrounding inte.

Basic Research in Agriculture; a Brief History of Research at Amani, 1928-1947

Farmers, fisherfolk, and forest dwellers not only understand and can apply ecosystem approaches in their decision-making, but also understand the potential impact of large-scale environmental threats to their livelihoods. FAO's biodiversity programmes apply ecosystem approaches to stimulate community level education and experiential learning by rural people. The same approaches educate national policy makers wishing to fulfill commitments made to environmental treaties while still meeting agricultural production demands.

Ecoagriculture

This book is about indigenous ways of farming in Northern Malawi in the face of modernization and globalization pressures. It also impacts modernization and globalization in relation to agriculture and environment in the developing countries laying bare their impacts on smallholder farmers, agriculture in general, industry and the environment.

Atlas of African agriculture research and development

The first of three books in IFPRI's climate change in Africa series, *West African Agriculture and Climate Change: A Comprehensive Analysis* examines the food security threats facing 11 of the countries that make up West Africa -- Benin, Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Liberia, Niger, Nigeria, Senegal, Sierra Leone, and Togo -- and explores how climate change will increase the efforts needed to achieve sustainable food security throughout the region. West Africa's population is expected to grow at least through mid-century. The region will also see income growth. Both will put increased pressure on the natural resources needed to produce food, and climate change makes the challenges greater. West Africa is already experiencing rising temperatures, shifting precipitation patterns, and increasing extreme events. Without attention to adaptation, the poor will suffer. Through the use of hundreds of scenario maps, models, figures, and detailed analysis, the editors and contributors of *West African Agriculture and Climate Change* present plausible future scenarios that combine economic and biophysical characteristics to explore the possible consequences for agriculture, food security, and resources management to 2050. They also offer recommendations to national governments and regional economic agencies already dealing with the vulnerabilities of climate change and deviations in environment. Decisionmakers and researchers will find *West African Agriculture and Climate Change* a vital tool for shaping policy and studying the various and likely consequences of climate change.

Pulse crops for sustainable farms in sub-Saharan Africa

Orphan Crops for Sustainable Food and Nutrition Security discusses the issues, challenges, needs and opportunities related to the promotion of orphan crops, known also as neglected and underutilized species (NUS). The book is structured into six parts, covering the following themes: introduction to NUS, approaches, methods and tools for the use enhancement of NUS, integrated conservation and use of minor millets, nutritional and food security roles of minor millets, stakeholders and global champions, and, building an enabling environment. Presenting a number of case studies at the regional and country levels, the chapters cover different but highly interlinked aspects along the value chains,

from acquisition and characterization of genetic diversity, cultivation and harvesting to value addition, marketing, consumption and policy for mainstreaming. Cross-cutting issues like gender, capacity building and empowerment of vulnerable groups are also addressed by authors. Representatives from communities, research for development agencies and the private sector also share their reflections on the needs for the use enhancement of NUS from their own perspectives. This book will be of great interest to students and scholars of food security, sustainable agriculture, nutrition and health and development, as well as practitioners and policymakers involved in building more resilient food and production systems.

Mountain Area Research and Management

Human Settlement Development is a component of Encyclopedia of Institutional and Infrastructural Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. The Theme on Human Settlement Development deals, in nine parts and four volumes, with a myriad of issues of great relevance to our world such as: Urban Sustainability and the Regional City System in the Asia Pacific; Peri-Urbanization: Zones of Rural - Urban Transition; Urban Sustainability: Theoretical Perspectives on Integrating Economic Development and the Environment; Rural Sustainability; Using Foreign Direct Investment to Improve Urban Environmental Infrastructure and Services- The Case of Hanoi, Vietnam; The Long Road Towards Sustainable Cities: The Dutch case; Urban Dimensions of Sustainable Development; Rural Development: Participation and Diversity for Sustainability; The Cities, the State and the Markets: In Search of Sustainability. These four volumes are aimed at the following five major target audiences: University and College students, Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs.

Biodiversity and the Ecosystem Approach in Agriculture, Forestry and Fisheries

The present edition of Nature & Faune journal emphasizes the role of natural renewable resources within the framework of Africa's agricultural transformation. Central to the transformation agenda is achieving greater prosperity which can improve peoples' lives and livelihoods. These improvements of lives and livelihoods cover their economic well-being; their environment; socio cultural and political sphere of influence. The conditions for modernizing Africa's agriculture entail transforming not only production processes but also the products. This issue of the Journal highlights the unique features of Africa's agriculture, including (i) the urgent need for improving productivity; (ii) the importance of the agricultural sector in Africa's economies in terms of employment; and (iii) the climate-resilient opportunities within agriculture to cope with climate change challenges. It draws attention to the fact that the agriculture sector offers possibilities for increased productivity while also adapting to and mitigating climate change thus safeguarding also future production.

Farming & Planting in British East Africa

This book is organised into three parts. The first part provides an introduction to the topic of agricultural biodiversity. The second part assesses each major sector; crop genetic resources, farm animal diversity, fish and aquatic life, forests, soil biodiversity and microbial genetic resources. The third part of the book focuses on outstanding policy issues and examines the emerging policy agenda for agricultural biodiversity. The loss of agricultural biodiversity threatens world food-security and this theme runs central to the chapters in this book.

Agriculture and Environment for Developing Countries

This report introduces FAO's work on biodiversity mainstreaming, including the regional consultation process that took place in 2018 and 2019. It particularly focuses on presenting the outcomes of the Regional Multi-Stakeholder Dialogue on Biodiversity Mainstreaming across Agricultural Sectors in the African Region, held in Kigali, Rwanda, in November 2019. This report presents the main topics addressed in its opening, plenary, and closing sessions; and highlights the most relevant regional needs, priorities, and recommendations identified by the meeting participants.

West African Agriculture and Climate Change

There is an urgent need to increase agricultural productivity in sub-Saharan Africa in a sustainable and economically-viable manner. Transforming risk-averse smallholders into business-oriented producers

that invest in producing surplus food for sale provides a formidable challenge, both from a technological and socio-political perspective. This book addresses the issue of agricultural intensification in the humid highland areas of Africa – regions with relatively good agricultural potential, but where the scarce land resources are increasingly under pressure from the growing population and from climate change. In addition to introductory and synthesis chapters, the book focuses on four themes: system components required for agricultural intensification; the integration of components at the system level; drivers for adoption of technologies towards intensification; and the dissemination of complex knowledge. It provides case studies of improved crop and soil management for staple crops such as cassava and bananas, as well as examples of how the livelihoods of rural people can be improved. The book provides a valuable resource for researchers, development actors, students and policy makers in agricultural systems and economics and in international development. It highlights and addresses key challenges and opportunities that exist for sustainable agricultural intensification in the humid highlands of sub-Saharan Africa.

Orphan Crops for Sustainable Food and Nutrition Security

This book provides a synthesis of current agricultural research in Africa with the aim of presenting evidence based information that can be directly applied into improving the African smallholder farmers' food security. It presents positive scientific research that has been undertaken in Africa, in simpler terms, thus driving the research for development agenda contributing to the attainment of SDG 2. Numerous research that targets resource poor African smallholder farmers has been published, yet the region faces very low productivity levels. This lack of translation from research to food security and increased agricultural incomes is due to the poor uptake of scientific research by farmers, which is partly due to poor presentation of this body of knowledge into simpler forms that extension workers and farmers can directly adopt. Therefore, this book offers research information in an easy, digestible and application oriented style, so as to enable transformation of the African agricultural sector by effectively driving agricultural productivity in Africa. This book is of interest to African extension workers, who will translate the simplified knowledge into lessons that can be useful to smallholder farmers. The book is also beneficial for policy makers as well as academics, researchers and other science based professionals.

Human Settlement Development - Volume IV

"This book reveals complex agricultural methods and dynamic farming strategies which evolved long before colonial intervention or recent development projects. These indigenous systems created spectacular landscapes, with terrace walls to conserve the soil and hill-furrow irrigation to supplement low or seasonal rainfall, thus allowing intensive exploitation of all usable land. Mulch or animal manure were applied to boost fertility on regularly planted fields. Labour, communal tasks and the allocation of land and water required social organization and the use of sanctions."--BOOK JACKET. Title Summary field provided by Blackwell North America, Inc. All Rights Reserved

Agricultural transformation in Africa: The role of natural resources

Designed as an accessible text on sustainable agriculture, this book contains information on community organization and participation, technologies for sustainability and the wider policy and service environment. The book looks at a variety of ways of encouraging sustainability through policy change and service provision, including: ways of improving financial services; ways of improving land security; and ways of improving training. The book is illustrated by a range of case studies and examples, and contains lists of contact addresses.

Human Nature

Food is a defining feature in every culture. Despite its very basic purpose of sustaining life, it directly impacts the community, culture and heritage in every region around the globe in countless seen and unseen ways, including the literature and narratives of each region. Across the African continent, food and foodways, which refer to the ways that humans consume, produce and experience food, were influenced by slavery and forced labor, colonization, foreign aid, and the anxieties prompted by these encounters, all of which can be traced through the ways food is seen in narratives by African and colonial storytellers. The African continent is home to thousands of cultures, but nearly every one has experienced alteration of its foodways because of slavery, transcontinental trade, and colonization. Food and Foodways in African Narratives: Community, Culture, and Heritage takes a careful look

at these alterations as seen through African narratives throughout various cultures and spanning centuries.

Regional Dialogue on Biodiversity Mainstreaming across Agricultural Sectors in the African Region

Orphan crops play an important role in food and nutrition security especially in growing economies where small-holder farmers produce the majority of food. Despite their importance in global agriculture and their often remarkable nutrient content and adaptation to challenging environmental conditions, orphan crops have received limited attention by the scientific community and industry. However, the diversity of neglected plant species provides a large genetic resource that could significantly contribute to broadening the biodiversity of trait-desired crops for novel value chains, sustainable development and food security. The uptake of new plant breeding techniques, notably genome editing, as well as 'omic' tools, are now accelerating translation of basic research and facilitating the exploration of orphan crops. These advancements also give rise to public and politic engagement discussions to maximize socio-economic impact. Given that the greatest need for food and nutritional security is in growing economies, issues of food sovereignty and sustainability of their food systems become front-and-centre. There is now an exceptional opportunity to tackle some of the major current challenges in agriculture, including climate change, sustainable cropping systems, food quality, and nutritional security through broadening research in wild relatives of crops and on orphan species. This Research Topic seeks to showcase research on neglected plants using advanced molecular technologies (e.g. genome sequencing, 'omics', etc) and new plant breeding approaches, methods, and tools. This Research Topic will also discuss the challenges and opportunities arising when modern breeding techniques are applied for translational research.

Promoting Farmer Innovation

Continued population growth, rapidly changing consumption patterns and the impacts of climate change and environmental degradation are driving limited resources of food, energy, water and materials towards critical thresholds worldwide. These pressures are likely to be substantial across Africa, where countries will have to find innovative ways to boost crop and livestock production to avoid becoming more reliant on imports and food aid. Sustainable agricultural intensification - producing more output from the same area of land while reducing the negative environmental impacts - represents a solution for millions of African farmers. This volume presents the lessons learned from 40 sustainable agricultural intensification programmes in 20 countries across Africa, commissioned as part of the UK Government's Foresight project. Through detailed case studies, the authors of each chapter examine how to develop productive and sustainable agricultural systems and how to scale up these systems to reach many more millions of people in the future. Themes covered include crop improvements, agroforestry and soil conservation, conservation agriculture, integrated pest management, horticulture, livestock and fodder crops, aquaculture, and novel policies and partnerships.

Agro-Ecological Intensification of Agricultural Systems in the African Highlands

The series *Tasks for Vegetation Science* is devoted to a variety of research aspects in vegetation science, pure as well as applied. Of the applied problems one of the most pressing is to achieve better knowledge and improvement of the pasture vegetation in tropical and subtropical regions. As series editor I was impressed by the sheer volume of useful scientific information concerning pasture plants from East Africa collected during many years by Dr. Boonman and compiled in one manuscript. Dr. Boonman first came to East Africa in 1963 on an overland journey along the river Nile which took him from Alexandria in Egypt to Lake Victoria in Uganda and Kenya and back again. After a brief spell as a cotton agronomist in the Sudan Gezira he joined the grassland research team at Kitale, Kenya in 1966. Improvement of seed yield of tropical grasses was his principal interest which finally led him into the field of breeding grasses. Well-known varieties from his work include Boma & Elmba Rhodesgrass as well as Clone 13 Elephantgrass. In 1979 he was recalled to The Netherlands to head a cooperative seed company involved in the breeding of grasses and cereals. The author has focused this study on one region, Eastern Africa. Global application of theories runs into conflicts too easily with local types of farming, if not with bare economics. Very few books can be found that describe existing practices and seek local answers by digging deep in the stacks of old, local reports.

Strengthening Rice Seed Systems and Agro-biodiversity Conservation in West Africa: a Socio-technical Focus on Farmers' Practices of Rice Seed Development and Diversity Conservation in Susu Cross Border Lands of Guinea and Sierra Leone

Food Security for African Smallholder Farmers