

Agricultural Crop Production Entrepreneurship Module 1

The 'Gender in Agriculture Sourcebook' provides an up-to-date understanding of gender issues and a rich compilation of compelling evidence of good practices and lessons learned to guide practitioners in integrating gender dimensions into agricultural projects and programs. It serves as a tool for: guidance; showcasing key principles in integrating gender into projects; stimulating the imagination of practitioners to apply lessons learned, experiences, and innovations to the design of future support and investment in the agriculture sector. The Sourcebook draws on a wide range of experience from World Bank, Food and Agriculture Organization (FAO), International Fund for Agricultural Development (IFAD), and other donor agencies, governments, institutions, and groups active in agricultural development. The Sourcebook looks at: access to and control of assets; access to markets, information and organization; and capacity to manage risk and vulnerability through a gender lens. There are 16 modules covering themes of cross-cutting importance for agriculture with strong gender dimensions (Policy, Public Administration and Governance; Agricultural Innovation and Education; Food Security; Markets; Rural Finance; Rural Infrastructure; Water; Land; Labor; Natural Resource Management; and Disaster and Post-Conflict Management) and specific subsectors in agriculture (Crops, Livestock, Forestry, and Fisheries). A separate module on Monitoring and Evaluation is included, responding to the need to track implementation and development impact. Each module contains three different sub-units: (1) A Module Overview gives a broad introduction to the topic and provides a summary of major development issues in the sector and rationale of looking at gender dimension; (2) Thematic Notes provide a brief and technically sound guide in gender integration in selected themes with lessons learned, guidelines, checklists, organizing principles, key questions, and key performance indicators; and (3) Innovative Activity Profiles describe the design and innovative features of recent and exciting projects and activities that have been implemented or are ongoing.

This background paper assesses the relevance of concepts and indicators of decent work for rural areas and employment in agriculture. It examines some of the main reasons for the lack of data on decent work, and proposes a selection of more relevant indicators as well as some ways to improve data collection.

This book constitutes Part I of the refereed four-volume post-conference proceedings of the 4th IFIP TC 12 International Conference on Computer and Computing Technologies in Agriculture, CCTA 2010, held in Nanchang, China, in October 2010. The 352 revised papers presented were carefully selected from numerous submissions. They cover a wide range of interesting theories and applications of information technology in agriculture, including simulation models and decision-support systems for agricultural production, agricultural product quality testing, traceability and e-commerce technology, the application of information and communication technology in agriculture, and universal information service technology and service systems development in rural areas.

Information and communication technology (ICT) has always mattered in agriculture. Ever since people have grown crops, raised livestock, and caught fish, they have sought information from one another. Today, ICT represents a tremendous opportunity for rural populations to improve productivity, to enhance food and nutrition security, to access markets, and to find employment opportunities in a revitalized sector. ICT has unleashed incredible potential to improve agriculture, and it has found a foothold even in poor smallholder farms. ICT in Agriculture, Updated Edition is the revised version of the popular ICT in Agriculture e-Sourcebook, first launched in 2011 and designed to support practitioners, decision makers, and development partners who work at the intersection of ICT and agriculture. Our hope is that this updated Sourcebook will be a practical guide to understanding current trends, implementing appropriate interventions, and evaluating the impact of ICT interventions in agricultural programs.

This report has two objectives. It assesses the nature and the extent of vulnerability among rural households in Tanzania with a particular focus on smallholder cash crop growers though exploring all risks, including the decline in commodity prices. It further explores the potential role for market based insurance schemes such as commodity price and weather based insurance to mitigate household vulnerability. The empirical analysis is based on two rounds of specifically designed representative surveys of farm households in Kilimanjaro and Ruvuma, two cash crop growing regions in the United Republic of Tanzania in 2003 and 2004. The contrasting experiences of a richer (Kilimanjaro) and a poorer (Ruvuma) region substantially enrich the policy guidance emerging from the report. The report applies descriptive, econometric and contingent valuation techniques to achieve its objectives.

The papers in this volume comprise the refereed proceedings of the Second IFIP International Conference on Computer and Computing Technologies in Agriculture (CCTA2008), in Beijing, China, 2008. The conference on the Second IFIP International Conference on Computer and Computing Technologies in Agriculture (CCTA 2008) is cooperatively sponsored and organized by the China Agricultural University (CAU), the National Engineering Research Center for Information Technology in Agriculture (NERCITA), the Chinese Society of Agricultural Engineering (CSAE), International Federation for Information Processing (IFIP), Beijing Society for Information Technology in Agriculture, China and Beijing Research Center for Agro-products Test and Farmland Inspection, China. The related departments of China's central government bodies like: Ministry of Science and Technology, Ministry of Industry and Information Technology, Ministry of Education and the Beijing Municipal Natural Science Foundation, Beijing Academy of Agricultural and Forestry Sciences, etc. have greatly contributed and supported to this event. The conference is a good platform to bring together scientists and researchers, agronomists and information engineers, extension servers and entrepreneurs from a range of disciplines concerned with impact of Information technology for sustainable agriculture and rural development. The representatives of all the supporting organizations, a group of invited speakers, experts and researchers from more than 15 countries, such as: the Netherlands, Spain, Portugal, Mexico, Germany, Greece, Australia, Estonia, Japan, Korea, India, Iran, Nigeria, Brazil, China, etc.

This first module on managing aquaculture as a business covers technical aspects such as primary productivity, carrying capacity, growth rate and yield in water, general classification criteria for aquaculture systems and the main features of pond- and cage-based fish farming systems. It will be complemented by a second module on the economic aspects.

Food problems - the efficient production or procurement of food and its appropriate distribution among members of society - are problems endemic to mankind. Yet the nature and dimensions of these problems have been changing over time. As economic systems have developed, specialization has increased; and this has led to increased interdependences of rural and urban areas, of agricultural and nonagricultural sectors, and of nations. When the International Institute for Applied Systems Analysis (IIASA) began the Food and Agriculture Program (FAP) in 1976, we started with these objectives: (1) To evaluate the nature and dimensions of the world food situation. (2) To identify the factors that affect it. (3) To suggest policy alternatives at national, regional, and global levels: (a) To alleviate current food problems. (b) To prevent food problems in the future. To realize these objectives, FAP was organized around two major tasks. The first task was directed at national policy for food and agriculture in an international situation. Here, computable general equilibrium models were developed for nearly 20 major developed and developing countries and were linked together to examine food trade, aid, capital flows, and how they affect hunger, in addition to the effects of national government policies, which were also considered in detail. This approach, however, needed to be complemented by another approach that dealt with food production at the farm level.

This manual is specifically designed to help train actual and potential farm mechanization service providers, in order to increase access to sustainable farm power to raise the productivity of smallholder farmers. It focuses on two crucial aspects: the provision of farm mechanization services as a viable business opportunity for entrepreneurs, and the essential criteria of raising productivity in an environmentally sensitive and responsible way i.e. that includes conservation agriculture. Practical guidance on the essential business development and management skills required to successfully run a mechanization service provision business are presented, with a focus on the equipment required to offer services compatible with conservation agriculture. The manual will be of particular interest to policymakers' intent on achieving sustainable intensification in the agricultural sector. It is also a valuable resource for trainers charged with increasing the supply of well-trained and well-equipped entrepreneurial mechanization service providers through the implementation of training courses tailored to the specific course locations.

Increasing awareness of the irreversible and long-lasting impacts of deterioration and pollution of soils and sediments has had an important influence on environmental policies and research in the last decade. The complexity of the soil and sediment systems and its processes cannot be tackled properly unless scientists from different disciplines work together. With this in mind, a number of multidisciplinary soil research programmes have been started in various European countries. They involve different disciplinary approaches and they aim at different fields of application: agriculture, land use and town and country planning, drinking water supply, nature management. The results that are now appearing need to be integrated in a scientifically sound and useful way. The first European Conference on Integrated Research for Soil and Sediment Protection and Remediation was intended to foster this. The volume contains the edited and selected proceedings of this Conference.

The FAO is implementing a project entitled "Sustainable Cropland and forest management in priority agro-ecosystems of Myanmar (SLM-GEF)" in coordination with the Ministry of Natural Resources and Environmental Conservation (MoNREC) and the Ministry of Agriculture, Livestock and Irrigation (MoALI) with funding from the Global Environment Facility (GEF). The project promotes climate smart agriculture (CSA) policies and practices at different levels in Myanmar. In the field, the project is active in five pilot Townships from three different agro-ecological zones implementing various relevant CSA initiatives mainly using Farmer Field Schools (FFS) models. In order to implement FFS effectively, the project has developed FFS Curricula for each of the above mentioned three agro-ecological zones with support from AVSI Foundation as a Service Provider. Similarly, the project has developed a FFS Handbook for each agro-ecological zone both in Myanmar and English version with support from AVSI Foundation as a Service Provider. This handbook is intended to help the Extension Workers, FFS Facilitators and FFS Committee/farmers to implement FFS on CSA techniques and practices in different agro-ecological zones and scaling up the learnings in similar areas of Myanmar.

Social protection programs—public or private initiatives that aid the poor and protect the vulnerable against livelihood risks—can effectively be used to assist those trapped, or at the risk of being trapped, in chronic poverty. These programs aim to address chronic poverty through redistribution and protect vulnerable households from falling below the poverty line. Although investments in social protection programs are often motivated by equity concerns, they can also contribute to economic growth by, for example, encouraging savings, creating community assets, and addressing market imperfections. Despite their potential and proliferation, not enough is known about social protection programs in Africa. The 2017–2018 Annual Trends and Outlook Report (ATOR) reduces this knowledge gap by focusing on the potential of such programs on the continent and the corresponding opportunities and challenges. The chapters of the Report highlight the benefits of these programs, not only to their direct recipients but also others in the community through spillover effects. They also underscore the importance of appropriate design and sustainability to fully realize the potential of social protection programs.

With a rapidly expanding economy many changes are taking place in India today. The business-as-usual (BAU) scenario, which assumes the continuation of current trends of key water demand drivers, will meet the future food demand. However, it leads to a severe regional water crisis by 2050, where many river basins will reach closure, will be physically water-scarce and will have regions with severely overexploited groundwater resources. While the alternative scenarios of water demand show both optimistic and pessimistic water futures, the scenario with additional productivity growth is the most optimistic, with significant scope for reducing future water demand.

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.

The book expands and formalizes the conceptual foundations of Climate-Smart Agriculture, drawing upon theory and concepts from agricultural development, institutional and resource economics. The book uses economic lens to identify the main features of CSA, its likely impact, and the challenges associated with its implementation. It is a product of the EPIC team in the ESA division and contributes to SO2 OO2. Climate Smart Agriculture (CSA) is a concept that calls for integration of the need for adaptation and

the possibility of mitigation in agricultural growth strategies to support food security. Several countries around the world have expressed intent to adopt CSA approach to managing their agricultural sectors. However there is considerable confusion about what the CSA concept and approach actually involve, and wide variation in how the term is used. It is critical to build a more formal basis for the CSA concept and methodology and at the same time providing illustrations of how the concept can be applied across a range of conditions.

Seeds are the vehicle for delivering the improvements in a crop to the farmer's field. They are therefore a critical input in agricultural production. Seeds are also unique in that they must remain alive and healthy when they are used and that they are also the input that farmers can produce by themselves. It is estimated that 25–33% of the world grain crop, including seeds, is lost each year during storage. To avert this obvious drawback to food security and nutrition, this module provides the underlying principles for effective seed storage and the associated practices. The module provides guidance on the preservation of seeds under controlled environmental conditions so as to maximize seed viability for the long periods that may be required from harvesting through processing to planting.

The objective of the World Programme for the Census of Agriculture 2010 is to assist countries in the conduct of their national census of agriculture, including guidance on the integrated system approach to agricultural censuses and surveys. This publication provides a detailed list of items suitable for inclusion in the national agricultural census programme as well as definitions, concepts and standards to be adopted.

The three-volume set IFIP AICT 368-370 constitutes the refereed post-conference proceedings of the 5th IFIP TC 5, SIG 5.1 International Conference on Computer and Computing Technologies in Agriculture, CCTA 2011, held in Beijing, China, in October 2011. The 189 revised papers presented were carefully selected from numerous submissions. They cover a wide range of interesting theories and applications of information technology in agriculture, including simulation models and decision-support systems for agricultural production, agricultural product quality testing, traceability and e-commerce technology, the application of information and communication technology in agriculture, and universal information service technology and service systems development in rural areas. The 62 papers included in the first volume focus on decision support systems, intelligent systems, and artificial intelligence applications.

Bhutan has experienced extraordinary change since the 1960s when it opened itself to the world and started the process of planned development. It has transformed itself from a subsistence economy into a middle-income country with rising human development indicators. Yet progress comes with new challenges. These include differences in living conditions and opportunities between rural and urban areas that fuel rural-urban migration, labor shortages in agriculture, and unemployment. There are gender dimensions to each of these challenges, prompting the Government of Bhutan and its development partners to mainstream gender in its policies, programs, and projects. This publication intends to support this process by providing insights into gender issues in agriculture and rural livelihoods, education, energy, environment, private sector development, transport, urban development, and work and unemployment.

Den Sonderband eröffnet ein Beitrag von Kirchmayer, Remišová und Lašáková über ethische Führung in öffentlichen und privaten Organisationen in der Slowakei. Authentische Führung und zwischenmenschliche Konflikte in Polen werden von Sypniewska und Gigol weiter aufgegriffen. Die Wahrnehmung des ethischen Klimas in der serbischen Tourismusindustrie wird von Dragin, Jovanovi?, Mijatov, Majstorovi? und Dragin untersucht. Prus untersucht die Förderung einer nachhaltigen Landwirtschaft durch die gezielte Hochschulbildung zur Landwirtschaft in Polen. Saveanu, Abrudan, Saveanu und Matei fordern, die Prädiktoren für CSR in kleinen und mittleren Unternehmen in Rumänien zu erforschen. Potocan, Mulej und Nedelko versuchen, die Einstellungen der Mitarbeiter zu natürlichen, sozialen und wirtschaftlichen Aspekten von CSR in slowenischen Organisationen während zweier Perioden - Wirtschaftskrise und Erholung für einen Kontext nach dem Übergang - empirisch zu untersuchen. Rybnikova und Toleikien? wenden sich den formalen und informellen Elementen der Infrastruktur für das Ethikmanagement in der litauischen Selbstverwaltung zu. Diese Ausgabe schließt mit einem Forschungsbericht über die Entwicklung der Nachhaltigkeit (Moral und Verantwortung) in der estnischen Wirtschaft durch Kooskora und Cundiff.

The agricultural sector can benefit immensely from developments in the field of smart farming. However, this research area focuses on providing specific fixes to particular situations and falls short on implementing data-driven frameworks that provide large-scale benefits to the industry as a whole. Using deep learning can bring immense data and improve our understanding of various earth sciences and improve farm services to yield better crop production and profit.

Smart Agricultural Services Using Deep Learning, Big Data, and IoT is an essential publication that focuses on the application of deep learning to agriculture. While highlighting a broad range of topics including crop models, cybersecurity, and sustainable agriculture, this book is ideally designed for engineers, programmers, software developers, agriculturalists, farmers, policymakers, researchers, academicians, and students.

The FAO is implementing a project entitled "Sustainable Cropland and forest management in priority agro-ecosystems of Myanmar (SLM-GEF)" in coordination with the Ministry of Natural Resources and Environmental Conservation (MoNREC) and the Ministry of Agriculture, Livestock and Irrigation (MoALI) with funding from the Global Environment Facility (GEF). The project promotes climate smart agriculture (CSA) policies and practices at different levels in Myanmar. In the field, the project is active in five pilot Townships from three different agro-ecological zones implementing various relevant CSA initiatives mainly using Farmer Field Schools (FFS) models. In order to implement FFS effectively in a proper way, the project has made efforts to develop FFS Curricula for each of the above mentioned three agro-ecological zones with support from AVSI Foundation as a Service Provider. Accordingly, the FFS Curriculum has been developed for central dry zone agro-ecological zone to be used by FFS Facilitators, Extension Workers and FFS Committee/farmers to implement FFS on CSA techniques and practices in systematic ways. As per the initial need assessment and value chain analysis, seasonal crops of groundnut, green gram, chickpea and pigeon pea have been identified as the priority crops in central dry zone of Mandalay Region based on technical feasibility, the crops already being grown in the area and have high market demand and contribute to improved nutrition of men and women and their households,

especially children, the elderly and the disabled. Therefore, the FFS module and FFS activities will cover those three prioritized crops. Similarly, the project focus in the central dry zone areas is also to promote agro-forestry practices and hence, the prioritised crops will be grown with some perennial crops such as mango, shaw-phyu (*Sterculia versicolor*) etc under agro-forestry concept. Saplings of multipurpose *Gliricidia sepium* will also be planted as windbreaks. Based on the needs and crops prioritized, prevailing cropping systems and discussion with the respective DoA Offices in Townships, there are seven major cropping systems identified for both the Townships. Therefore, the FFS implementation will cover all the seven cropping systems. The curriculum has identified several modules of FFS meetings/trainings to be held at the FFS sites for the FFS Committee members, usually in every month, in addition to a Pre-FFS Introductory Meeting held before starting the formal FFS programme. There are some technical topics identified in the curriculum to be covered in every FFS meeting/training. It is expected that the FFS curriculum will help the FFS Facilitators, Extension Workers and FFS Committee/farmers to implement FFS on CSA techniques and practices in systematic and proper ways

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Managing the ability of agriculture to meet rising global demand and to respond to the changes and opportunities will require good policy, sustained investments, and innovation - not business as usual. Investments in public Research and Development, extension, education, and their links with one another have elicited high returns and pro-poor growth, but these investments alone will not elicit innovation at the pace or on the scale required by the intensifying and proliferating challenges confronting agriculture. Experience indicates that aside from a strong capacity in Research and Development, the ability to innovate is often related to collective action, coordination, the exchange of knowledge among diverse actors, the incentives and resources available to form partnerships and develop businesses, and conditions that make it possible for farmers or entrepreneurs to use the innovations. While consensus is developing about what is meant by 'innovation' and 'innovation system', no detailed blueprint exists for making agricultural innovation happen at a given time, in a given place, for a given result. The AIS approach that looks at these multiple conditions and relationships that promote innovation in agriculture, has however moved from a concept to a sub-discipline with principles of analysis and action. AIS investments must be specific to the context, responding to the stage of development in a particular country and agricultural sector, especially the AIS. This sourcebook contributes to identifying, designing, and implementing the investments, approaches, and complementary interventions that appear most likely to strengthen AIS and to promote agricultural innovation and equitable growth. It emphasizes the lessons learned, benefits and impacts, implementation issues, and prospects for replicating or expanding successful practices. The information in this sourcebook derives from approaches that have been tested at different scales in different contexts. It reflects the experiences and evolving understanding of numerous individuals and organizations concerned with agricultural innovation, including the World Bank. This information is targeted to the key operational staff in international and regional development agencies and national governments who design and implement lending projects and to the practitioners who design thematic programs and technical assistance packages. The sourcebook can also be an important resource for the research community and nongovernmental organizations (NGOs). The purpose of this guide is to provide a better understanding of the concept and practice of entrepreneurship. This guide has been prepared for people who want to start a farm business for the first time and for farmers that want to make changes to their farming systems by introducing high value enterprises directed to the market. This guide can also help extension workers be better able to help farmers develop the skills and spirit of an entrepreneur. Is it part of a series of booklets on farm business management designated to help extension workers support farmers.

International concern for the continued growth of greenhouse gas emissions, and the potentially damaging consequences of resultant global climate change, led to the signing of the United Nations Framework Convention on Climate Change by 155 nations at the Earth Summit in June 1992. The Convention came into force on 21 March 1994, three months after receiving its 50th ratification. All Parties to the Convention are required to compile, periodically update, and publish national inventories of anthropogenic greenhouse gas emissions and sinks using comparable methodologies. In support of this process, the US Country Studies Program (US CSP) is providing financial and technical assistance to 56 developing and transition countries for conducting national inventories. This book presents the results of preliminary national inventories prepared by countries participating in the US CSP that are ready to share their interim findings. In some cases, inventories were prepared with support from other organizations. Preliminary inventories of twenty countries in Africa, Asia, Central and Eastern Europe and the Newly Independent States, and Latin America are presented, as well as regional and global syntheses of the national results. The regional and global syntheses also discuss results of eleven other preliminary national inventories that have been published elsewhere with the assistance of other programs. Results are discussed in the context of national and regional socioeconomic characteristics, and the regional and global syntheses compare national inventory estimates to other published estimates that are based largely on international databases. Papers also discuss inventory development issues, such as data collection and emission factor determination, and problems associated with applying the IPCC inventory methodologies. The preliminary inventory results reported here represent significant progress towards meeting country commitments under the Framework Convention, and provide useful information for refining international greenhouse gas emission databases and improving inventory methodologies. As the first book to compile national greenhouse gas emission estimates prepared by national experts in developing countries and countries with economies in transition, this will be an invaluable resource to scientists, policymakers, and development specialists in national, regional and global anthropogenic sources and sinks of greenhouse gases.

This guide has been developed for extension officers in both the public and the private, including those interested in agricultural development in Zambia. The goal of this manual is to serve as a tool that allows readers to access up to date information about various agricultural practices and their advantages and disadvantages. There are many organisations in Zambia that have programs that aim towards sustainable development in the agricultural sector. Amongst these programs, there are many different approaches to the goal of improving livelihoods. Although these various programs have good reasons for promoting their specific methods, this manual aims to take an independent stance to portray what all of them offer and why. This manual also includes significant information about new approaches and traditional farmer practices or conventional farming methods. The central theme in this manual is that there can never be only one way to achieve a goal under such diverse conditions as are found in agriculture. Although a certain amount of benefit can be gained by rigid guidelines to agricultural practice (for example a specific crop spacing,

tillage method or fertilizer recommendation), the diverse factors that affect peoples' decisions relate to economic, social and environmental conditions make such guidelines impractical in many cases.

This book constitutes the thoroughly refereed post-conference proceedings of the Third IFIP TC 12 International Conference on Computer and Computing Technologies in Agriculture, CCTA 2009, held in Beijing, China, in October 2009. The 80 revised papers were carefully selected from numerous submissions. The papers cover a wide range of interesting theories and applications of information technology in agriculture, including simulation models and decision-support systems for agricultural production, agricultural product quality testing, traceability and e-commerce technology, the application of information and communication technology in agriculture and universal information service technology, and service systems development in rural areas.

Entrepreneurship in FarmingFood & Agriculture Org

Between 2013 and 2015, the Food and Agriculture Organization of the United Nations (FAO) and the French National Institute for Agricultural Research (INRA) undertook a survey of innovative approaches that enable markets to act as incentives in the transition towards sustainable agriculture in developing countries. Through a competitive selection process, 15 cases from around the world provide insights into how small-scale initiatives that use sustainable production practices are supported by market demand, and create innovations in the institutions that govern sustainable practices and market exchanges. These cases respond to both local and distant consumers' concerns about the quality of the food that they eat. The book evidences that the initiatives rely upon social values (e.g. trustworthiness, health [nutrition and food safety], food sovereignty, promotion of youth and rural development, farmer and community livelihoods) to adapt sustainable practices to local contexts, while creating new market outlets for food products. Specifically, private sector and civil society actors are leading partnerships with the public sector to build market infrastructure, integrate sustainable agriculture into private and public education and extension programmes, and ensure the exchange of transparent information about market opportunities. The results are: (i) system innovations that allow new rules for marketing and assuring the sustainable qualities of products; (ii) new forms of organization that permit actors to play multiple roles in the food system (e.g. farmer and auditor, farmer and researcher, consumer and auditor, consumer and intermediary); (iii) new forms of market exchange, such as box schemes, university kiosks, public procurement or systems of seed exchanges; and (iv) new technologies for sustainable agriculture (e.g. effective micro-organisms, biopesticides and soil analysis techniques). The public sector plays a key role in providing legitimate political and physical spaces for multiple actors to jointly create and share sustainable agricultural knowledge, practices and products.

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