Food and Agriculture Organization of the United Nations

CATALYSING DIALOGUE AND COOPERATION TO SCALE UP AGROECOLOGY:

OUTCOMES OF THE FAO REGIONAL SEMINARS ON AGROECOLOGY

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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EXECUTIVE SUMMARY

STRENGTHENING THE GLOBAL DIALOGUE ON AGROECOLOGY, LAYING THE GROUNDWORK FOR ENHANCED COOPERATION

Agroecology is fast gaining interest worldwide among a wide range of actors as a holistic response to the multiple and interrelated challenges facing food systems – not least of which include continued poverty and hunger in the context of degrading natural resources and climate change. A growing number of family farmers, researchers, consumers, NGOs and governments at local and national level are calling for greater support for the systemic approach offered by agroecology.

FAO's engagement with agroecology has catalysed an even wider level of interest by taking the dialogue to regions where agroecology was less known, and by bringing together actors who have been working separately – sometimes following different visions of agroecology. As an inter-governmental organization, FAO provided the space for focused exchanges on the role of public policies in supporting agroecology. More than 1 400 participants from 170 countries came together through one international symposium and seven regional seminars on agroecology, co-organized by FAO and local partners. Keeping with one of the central tenets of agroecology, FAO ensured a central focus on the knowledge of family farmers, including through their involvement in the programming of the regional seminars.

The seminars showed that agroecology is strongly supported by many stakeholders as a holistic approach to transforming food systems. The explicit focus on the social and economic dimensions of food systems is one of the specific characteristics of agroecology as compared to other approaches to sustainable agriculture. This is achieved by taking a human rights based approach, with a strong focus on equity and the rights of women, youth, and indigenous peoples, as well as prioritizing support for small-scale and family farmers. The seminars captured a wide range of experiences, practices, initiatives, and policies from all stakeholders and regions.

AGROECOLOGY FOR SUSTAINABLE FOOD AND AGRICULTURE SYSTEMS

Agroecology has been defined as the application of ecological science to the study, design and management of sustainable agriculture and has since been broadened to cover the ecology of the food system, reflecting the systemic approach of agroecology. More recently, it has been described as a science, a social movement and a practice highlighting the evolution of the understanding of agroecology. The High Level Panel of Experts on Food Security and Nutrition (HLPE) of the Committee on World Food Security makes it explicit for the first time that food security and nutrition are the ultimate aim of agroecology.

Agroecology aims to create diversified agro-ecosystems, mimicking natural systems as closely as possible to enhance sustainable production and self-reliance. Furthermore, it aims to address

the problems of unequal access to natural resources and knowledge as among the root causes of poverty – in addition to marginalization and insecurity – and to re-territorialize food systems for a healthy and diversified diet. The full range of benefits is visible in the long term and with sufficient support, particularly from public policies.

It was recalled that agroecology goes beyond technical solutions and innovations based on incremental changes and can drive genuine transformative change in food and agricultural systems by moving towards socio-ecological systems that place people (farmers and consumers) at the centre of food systems. Agroecology takes a systems approach to agriculture to tackle the root causes of unsustainable practices in food production, which often lie outside farms – for instance in market regulations that favour long value chains for commodity crops, in policies that do not support diversification, and in innovation systems that are not adapted to agroecology and create structural barriers to alternatives to intensive systems.

MULTIPLE VIEWPOINTS AND IMPORTANT CONVERGENCES

The regional discussions showed that agroecology is a living concept, one which is subject to multiple, partly overlapping interpretations and adaptation by various actors. The cooperation of all the actors through the regional seminars showed that agroecology can be a catalyst for unifying different approaches and for moving forward together on a demanding but progressive path towards greater sustainability.

Despite the diversity of situations observed in the regions, successful initiatives in agroecology share a number of common points:

- The diversification of production systems and products in space and time. This diversification favours ecosystem services, boosting efficiency in the use of natural resources (soil, air, sun, and water) through the synergy of components, natural recycling of elements and leads to greater resilience of agroecosystems.
- Contextualization of approaches valuing the local food heritage and culture and an emphasis on respect for human and social values.
- Co-innovation between farmers and researchers through, inter alia, participatory research systems that enable the production of knowledge adapted to farmers' real needs and contexts.
- The importance of knowledge sharing among farmers with particular attention to the role of women, which allows for greater autonomy and adaptive capacity of farmers.
- A territorial and decentralized approach favouring cooperation between actors, innovative markets for the creation of added value and employment at the local level and the creation of integrated territorial approaches leading to a circular economy and food systems.
- Responsible and equitable governance of natural resources to give producers secure and sustainable access to natural resources, ensuring their sustainable use and thus long-term food security.

AGROECOLOGY AS A TRANSITION PROCESS DRIVEN BY ACTORS

Agroecology requires context-specific practices and policies that require time to achieve their full potential, bringing to the fore the need to plan transition processes. The seminars showed that the agroecological transition involves a diversity of pathways that must be built with stakeholders with due consideration to local contexts and must be implemented at different paces. Isolated initiatives by farmers cannot be effective to achieve the transition and therefore effective change should be sought at a territorial level. Often social organizations' work from the bottom-up plays an important part in territorial approaches.

It was highlighted in all regions that the transition calls for profound changes in the organization and governance of food systems, which requires a robust commitment from all actors and can sometimes upset the established order or specific interests.

Social mobilization is a key factor in facilitating the transformative potential of agroecology, since it is the sum of local transformations and innovations that will lead to a global transformation. Researchers have also always played an important role in the development of agroecology and a growing number of scientists are committed to supporting the transition to agroecology. Engaging all actors, especially economic actors, is also essential to complete the transition. Networks of actors and experience sharing platforms are emerging in all regions in various formats, and the participants of all seminars unanimously called for such networks to be created on larger scales. Although such networks may be sectoral, such as networks of researchers, there is a trend towards ensuring a global vision and multistakeholder exchanges to foster innovation and co-creation by setting up thematic networks of farmers, researchers and citizens.

The role of governments is fundamental for creating an enabling environment for agroecology, and the need for reviewing institutional policy, legal and financial frameworks to promote agroecological transition was at the centre of the debate. Observations on the public policies implemented in three countries in different continents (Brazil, France and China) showed how agroecology's comprehensive approach allows multiple issues to be taken into account at economic, social and environmental level. The main features of public policies on agroecology are their comprehensive nature, participatory and context-specific approaches, inter-disciplinarity and transformative intent.

KEY ISSUES AND COMMON RECOMMENDATIONS ON AGROECOLOGICAL TRANSITIONS FROM THE SEMINARS

The regional seminars discussed a range of topics related to agroecology, its impact and the challenges it faces. From these broad discussions, a number of key issues emerged across all regions which highlight both challenges and opportunities. The degradation of the natural resource base was a key concern and participants stressed that this could be mitigated by agroecology, which reduces and eliminates synthetic industrial inputs and processed feed, restores degraded agro-ecosystems, conserves biodiversity, and helps to mitigate and adapt to climate change.

At the same time, boosting production is a requirement but is not sufficient to tackle hunger, since availability is only one of the four pillars needed to achieve food security, along with access, utilization and stability. Tackling the unequal access of food producers to natural resources (land, water, fisheries, forests and genetic resources) was identified as a prerequisite for agroecology to contribute to eliminating rural poverty. Agroecology can help rural women in family farming agriculture to develop higher levels of autonomy through knowledge, collective action and some levels of commercialization.

The growing disengagement of young people from farming systems is a major challenge that was repeated in all regions. Agroecology could contribute to creating jobs for young people who will join the labour market and for whom urban centres have no more employment opportunities, by galvanizing initiatives to support entrepreneurship in the fields of agricultural production, product processing and sales, adapting mechanization to local context and training.

The standardization and industrialization of food products has also led to public health concerns in all regions. Paradoxically, alongside the scourge of hunger, overweight and obesity is on the rise. There is growing evidence suggesting that agroecology, implying diversified farming systems, facilitates diverse diets among producers, households and consumers. In all regions, participants agreed on the importance of harnessing the power of consumers to effect transformational change towards healthy food systems based on agroecology.

To transition towards sustainable food systems, agroecology must move beyond individual farms or projects. Isolated initiatives by farmers cannot be effective to achieve the agroecological transition – what is needed is an integrated, territorial approach. Territorial approaches raise questions related to governance since all relevant stakeholders within the territory need to be engaged and to take action based on coordinated policies and programmes. Strengthening accountability in governance and bringing control over food systems to the local level are among the priorities for many supporters of agroecology.

Based on a review and synthesis of the 160 recommendations made during the regional seminars, general priority orientations emerge representing lines of action that contribute to supporting agroecology transitions:

1. Strengthening the central role of producers and their organizations in safeguarding, utilizing and accessing natural resources.

   This entails recognizing and preserving traditional knowledge and culture; promoting the dynamic management of biodiversity and use of local and traditional crops and breeds; supporting product diversification and integration of cropping, livestock, aquaculture and forestry; restoring and enhancing soil quality and fertility; and guaranteeing access to and use of productive natural resources for family farmers (land, water, forest, fisheries and genetic resources).

2. Fostering experience and knowledge sharing, collaborative research and innovation.

   This consists of developing farmer-led and participatory research and co-innovation; developing interdisciplinary and transdisciplinary research and filling research gaps; promoting technical, social and institutional innovations for agroecology; setting up multi-stakeholder cooperation platforms; and investing in capacity development, including support for agroecology training initiatives among grassroots organizations.

3. Promoting markets for agroecology-based products and services.
   This consists of supporting short supply chains and innovative markets such as public procurement schemes; raising consumer awareness of the benefits of agroecological products, including nutritional quality and health; developing solidarity-based economies and private sector engagement; and promoting territorial approaches and the transition to circular food systems.
4. Reviewing institutional policy, legal and financial frameworks to promote agroecological transition for sustainable food systems.
   This entails developing public policies and initiatives with appropriate funding to support the agroecological transition; considering the specific needs of family farmers including women and youth by including them in policy development; implementing integrated and coherent food policies and guidelines with greater coherence and long-term thinking; and considering the externalities of agriculture and drawing up multicriteria indicators to measure the long-term performance of agroecological systems.

MOVING FORWARD TOGETHER TO SCALE UP AGROECOLOGY

The regional seminars called on FAO to continue to play a role in bringing together a wide range of actors to learn from each other's experiences, to exchange policy lessons, and to collaborate in moving forward together to further support and scale up agroecology. Given the differences in understandings of agroecology, the issue for FAO is to propose a path towards the agroecological transition which will bring on board all actors who want to progress towards more sustainable food systems without diluting the transformational potential of agroecology, especially in a context where world leaders stress the need for transformative approaches. The SDGs provide a framework for this.

Through the regional seminars, FAO developed 10 Elements that are essential components of agroecology in line with the five FAO principles for sustainable agriculture. These are: efficiency, resilience, diversity, co-creation of knowledge, recycling, synergies, human and social values, circular and solidarity economy, culture and food traditions, and land and natural resource governance. The 10 Elements consider major environmental, social and economic processes and enabling-environment factors – and their interactions – typical of diversified agricultural systems that are guided by agroecological principles and practices. They also recognize the great potential of collective action processes to foster knowledge sharing, and to deepen understanding, enabling behavioural changes in food systems that are required for sustainable agriculture to become a reality. They guide transition processes and are a pathway to achieving FAO's common vision of sustainable food and agriculture.

FAO is launching the next phase of the global dialogue on agroecology, by galvanizing efforts to scale up agroecology. Elements from the recommendations of the regional seminars will feed an agenda for action. FAO has also led the creation of an international agroecology partnership initiative, the Scaling up Agroecology Initiative, which will be launched at the Second International Symposium on Agroecology.

INTRODUCTION

Agroecology has been gaining interest in recent years among government, research and civil society organisations worldwide and many actors present it as a strategic pathway to transition to sustainable food and agriculture systems for achieving food and nutrition security. Responding to the growing interest in agroecology, FAO organized an International Symposium on Agroecology for Food Security and Nutrition in Rome in September 2014. The objective was to assess the extent and impact of agroecological practices, identify constraints and develop common priorities going forward to support the further implementation and scaling up of agroecology. The need to understand the specific local requirements and realities of agroecology led to a series of regional multistakeholder seminars co-organized by FAO in Latin America and the Caribbean, sub-Saharan Africa, Asia and the Pacific, China, Europe and Central Asia, and the Near East and North Africa from 2015 to 2017 (see Table 1 below).

Table 1 Regional FAO multistakeholder seminars on Agroecology

LATIN AMERICA AND THE CARIBBEAN	SUB-SAHARAN AFRICA	ASIA AND THE PACIFIC	EUROPE AND CENTRAL ASIA	NEAR EAST AND NORTH AFRICA
Brasilia Brazil **June 2015**	Dakar Senegal **October 2015**	Bangkok Thailand **November 2015**	Budapest Hungary **November 2016**	Tunis Tunisia **November 2017**
La Paz Bolivia (Plurinational State of) **September 2016**		Kunming China **August 2016**		

The seminars brought together more than 1 400 participants from 170 Members in five regions (sub-Saharan Africa, Latin America and the Caribbean, Asia and the Pacific, Europe and Central Asia, and the Near East and North Africa). The meetings were organized with the support of external Advisory Panels, composed of researchers, representatives of farmers'[1] organizations and civil society, governments and FAO regional and national offices. The reports of the regional seminars are available on the FAO agroecology knowledge hub.[2]

Participants from all stakeholder groups – farmers, fisherfolk, representatives of indigenous peoples, consumers, scientists, representatives of NGOs, representatives of the private sector and governments – set out the challenges they face, presented the scope of solutions and agroecological innovations, and debated the obstacles and levers to develop these systems. They made recommendations directed at all stakeholders, which were adopted by consensus at the end of the seminars. Echoing the call for transformation of the 2030 Agenda, it was made clear during the seminars that merely making adjustments to current unsustainable food systems will not lead to the changes required to tackle the climate, environmental and social emergencies that the world is now facing.

[1] In this report, 'farmers' refers to all food producers.

[2] www.fao.org/agroecology/en

Figure 1 Reports of the FAO regional seminars

These seminars provided many opportunities for exchange and debate and revealed that while the scientific framework for agroecology dates back to the last century, it is a living concept and can be interpreted differently by different actors. The seminars gave rise to significant debates on the future of agriculture and the role of agroecology in food and nutrition security and gave the opportunity to regional actors to work together. The participants' testimonies showed not only the wealth of existing initiatives but also their high expectations about supporting an agroecological transition on a larger scale.

The agroecological transition can translate into a diversity of pathways that have to be built with stakeholders, with due consideration of local contexts, and implemented at appropriate paces. This implies cohabitation of diverse systems at different stages of transition. Finally, the transition goes beyond agricultural activities; it fosters a change in both the food system and the relationship of agriculture with nature and society. The seminars revealed the need to strengthen the evidence for agroecology, including through data collection, particularly on socioeconomic impacts; and to facilitate the exchange of science, information and best practices among countries and regions.

Common issues that emerged regarding the role of FAO were: to continue strengthening the evidence for agroecology; to provide technical and knowledge-based input to FAO Members; and to facilitate the exchange of science, information and best practices among countries and regions, including through South-South cooperation.

The aim of this document is to present the main lessons learned from the regional meetings and drawing from this, to propose a framework for action to support the development of agroecology in the coming years. This is a direct contribution to the *2nd International Symposium on Agroecology: Scaling up Agroecology to achieve the SDGs*, which will be held in Rome in April 2018 to report on the regional seminars and consider priorities and options for moving from dialogue to action. The report does not deal comprehensively with all aspects of agroecology,

Figure 2 FAO regional seminar, Dakar, 2015

but rather presents a synthesis of the discussions in the seminars. For example, although the debate on agroecology integrates the agricultural, forestry and fisheries sectors, it is necessary to recognize that most of the debates focused on the agricultural sector, which is reflected throughout this document. Similarly, because the document gives priority to the information gathered at the multistakeholder seminars, the use of scientific references is intentionally reduced.

Section 1 of this report presents the main debates of the seminars regarding the evolving understandings of agroecology, and about agroecological transitions.

Section 2 presents a summary of the main issues discussed at the regional seminars. Key messages regarding agroecology in each region are set out in Annex I.

Section 3 describes the recommendations adopted by the stakeholders during the seminars. The recommendations of each FAO regional seminar are set out in full in Annex II in addition to the synthesis and analysis of these recommendations.

Section 4 outlines the follow-up to the seminars and looks to possible future follow-ups including the Scaling up Agroecology Initiative.

IN THIS DOCUMENT

Family farmers are considered in a range from smallholder to medium-scale farmers, and include peasants, indigenous peoples, traditional communities, fisher folks, mountain farmers, pastoralists and many other groups representing every region and biome of the world. They run diversified agricultural systems and preserve traditional food products, contributing both to a balanced diet and the safeguarding of the world's agro-biodiversity (FAO Family Farming Knowledge Platform, 2018).

Agriculture refers to crops, livestock, fisheries (capture and aquaculture) and forestry.

SECTION 1

AGROECOLOGY: TRANSITIONS TO SUSTAINABLE FOOD SYSTEMS

- AGROECOLOGY AS AN EVOLVING CONCEPT
- AGROECOLOGY AS A TRANSITION PROCESS
- SELF-REINFORCING MECHANISMS IN UNSUSTAINABLE FOOD SYSTEMS
- THE ACTORS OF AGROECOLOGICAL TRANSITIONS

AGROECOLOGY AS AN EVOLVING CONCEPT

Since the 1920s, scientists and researchers have used the term agroecology to refer to the application of ecological principles to agriculture. At the technical level, the application and local adaptation of the five principles of agroecology (Altieri, 1995) is the starting point for agroecology (see Box 1). Altieri's seminal definition (1995) as "the application of ecological science to the study, design and management of sustainable agriculture" has since broadened to cover "the ecology of the food system" (Francis *et al.*, 2003), reflecting the systemic approach of agroecology.

Box 1 **Five principles of Agroecology**

1. Recycling of biomass and balancing nutrient flow and availability.
2. Securing favorable soil conditions for plant growth, through enhanced organic matter and soil biotic activity.
3. Minimizing losses of solar radiation, air, water and nutrients through microclimate management, water harvesting and soil cover.
4. Enhancing species and genetic diversification of the agroecosystem in time and space.
5. Enhancing beneficial biological interactions and synergisms among agrobiodiversity components resulting in the promotion of key ecological processes and services.

Altieri, M.A. 1995. *Agroecology: The Science of Sustainable Agriculture.* CRC Press

In keeping with this broader interpretation, participants of the FAO regional seminars on agroecology consistently stressed the social dimension of agroecology and the growing role played by civil society in spreading this approach which is illustrated in the description that agroecology is a "science, a social movement and a practice" (Wezel *et al.*, 2009). The High Level Panel of Experts on Food Security and Nutrition (HLPE) of the Committee on World Food Security makes it explicit for the first time that food security and nutrition are the ultimate aim of agroecology (FAO, 2016d):

> "From a scientific and technical perspective, agroecology applies ecological concepts and principles to food and farming systems, focusing on the interactions between microorganisms, plants, animals, humans and the environment, to foster sustainable agriculture development in order to ensure food security and nutrition for all, now and in the future. Today's more transformative visions of agroecology integrate transdisciplinary knowledge, farmers' practices and social movements while recognizing their mutual interdependence."

There are several ways of understanding agroecology that often differ according to stakeholder group, reflecting diverging visions, objectives and strategies. There are also variations between and within regions due to differing histories and trajectories. This diversity in the way agroecology is understood is at the heart of the debate. While there is consensus around the ecological principles that underpin agroecology, there are multiple views on what sustainability entails in the broadest sense and how to achieve it, pointing to the need for continued evidence building and dialogue. Participants in all regions welcomed the interest of a wide range of actors in agroecology. Nevertheless, civil society actors in particular warned against the risk of agroecology being reduced to a set of farming practices without addressing wider systemic issues such as governance of food systems.

Figure 3 FAO regional seminar, Budapest 2016

AGROECOLOGY AS A TRANSITION PROCESS

The transition process is a key concept for understanding agroecology. Indeed, for many farmers a rapid shift to sustainable agro-ecosystem design and practices is not easy, as moving to a complex and integrated system requires time, knowledge, strong commitment and specific policy support. Framing agroecology as a transition process also engages in dialogue actors who, as shown above, may have different approaches to agroecology. While the importance of sustainable agricultural practices is recognized and well documented, ensuring the progressive transition towards increasingly more integrated production systems, within the broader context of sustainable food systems, is a significant challenge.

One possible way of conceptualizing agroecological transitions was raised in a number of regions, based on the five levels of transition proposed by Gliessman (Gliessman, 2015). As a result, many transition efforts proceed in small steps towards the ultimate goal of sustainability, or are simply focused on developing food production systems that are somewhat more environmentally sound. The levels do not necessarily take place sequentially, but do shed some light on the various processes that take place in agroecological transitions.

- Level 1: Increase the efficiency of industrial/conventional practices in order to reduce the use and consumption of costly, scarce, or environmentally damaging inputs.
- Level 2: Substitute industrial/conventional inputs and practices, replacing them with alternative practices.
- Level 3: Redesign the agro-ecosystem so that it functions on the basis of a new set of ecological processes.
- Level 4: Re-establish a more direct connection between those who grow the food and those who consume it.
- Level 5: On the foundation created by the sustainable farm-scale agro-ecosystems of level three and the sustainable food relationships of level four, build a new global food system, based on equity, participation and justice, that is not only sustainable but also helps restore and protect Earth's life-support systems.

Participants pointed out that in general agricultural systems are in transition and that often environmental problems are one of the features of transitions (e.g. farmers and consumers moving away from Green Revolution technologies in Asia). At the same time regions and countries – and within them territories and even individual farmers – are at different levels of transition so there is a spectrum of intermediate situations. Supporting transitions means tailoring interventions to the needs of farmers at different levels of transition.

Starting points and pathways will inevitably vary considerably depending on the type of agriculture, environment and socioeconomic contexts. For example, the FAO Regional Seminar for Asia and the Pacific began with testimonials from farmers representing the variety of experiences of agroecology in that region: System of Rice Intensification (SRI) in Cambodia, arid zone crops in Australia, fisheries in India, and forest coffee-growing in Thailand. In addition, depending on the role and means of the state, the level of public policies or funds to support the transition will differ, resulting in different transition paths.

The importance of a territorial approach was highlighted in Asia and the Pacific, Europe and Central Asia, and the Near East. Isolated initiatives of farmers cannot be effective to achieve the transition and therefore effective change must be sought at a territorial level. Often, the bottom-up work that social movements carry out plays an important part in territorial approaches.

It is clear that transition processes will come up against obstacles, including policies that promote unsustainable food systems. Therefore, as recommended by participants in China, there is a need to ensure policy coherence, such that policies that hinder the transition toward agroecology are revised. Various ministries should cooperate to support policies concerning agroecology, such as ministries for environment, agriculture, forestry, rural development, health, trade and finance. This view was echoed by participants in Asia and the Pacific who said that for an agroecological transition to happen in Asia, the existing, production-focused paradigm of agricultural development will need to make way for a more holistic, people- and rights-centred approach.

Despite the diversity of situations observed in the regions, the successful transition initiatives in agroecology share a number of common points:

- The diversification of production systems and products in space and time. This diversification favours ecosystem services, boosting efficiency in the use of natural resources (soil, air, sun, and water) through the synergy of components, natural recycling of elements and leading to greater resilience of agro-ecosystems.
- Contextualization of approaches valuing the natural, historical, cultural and local food heritage and an emphasis on respect for human and social values.
- Co-innovation between farmers and researchers through, *inter alia,* participatory research systems that enable the production of knowledge adapted to farmers' real needs and contexts.
- The importance of knowledge sharing among farmers with particular attention to the role of women, which allows for greater autonomy and adaptive capacity of farmers.
- A territorial and decentralized approach favouring cooperation between actors, innovative markets for the creation of added value and employment at the local level and the creation of integrated territorial approaches leading to a circular economy and food systems.
- Responsible and equitable governance of natural resources to give producers secure and sustainable access to natural resources, ensuring their good management and long-term food security.

SELF-REINFORCING MECHANISMS IN UNSUSTAINABLE FOOD SYSTEMS

In Europe and Central Asia and China, key obstacles that make the system difficult to transform without a structural approach were highlighted, based on work carried out by IPES FOOD (IPES-Food, 2016). The study points to eight lock-ins that prevent change: 1) path dependency, 2) concentration of power, 3) expectation of cheap food, 4) export orientation, 5) compartmentalization, 6) short-term thinking, 7) 'feed the world' narratives and 8) measures of success. Overcoming these lock-ins are particularly challenging in regions where there is a high dependence on inputs and a strong role of input providers and of the food chain sector in the Agricultural Knowledge and Innovation System.

In Europe and Central Asia participants denounced the risk that agroecological innovations may be integrated into unsustainable food systems, leading to conformity rather than the transformative process needed to achieve the SDGs. For example, in every region participants mentioned that inputs for organic agriculture have become commoditized, making farmers dependent on input suppliers.

Some participants mentioned that international trade regulations are not adapted to the challenges that countries are facing regarding food security and the specificity of food products that are linked to a territory and a socioecological system. It was also pointed out that competition and direct subsidies for food products sends a false message to consumers who no longer know the real price of food, putting cheap food products on the market that neither cover producers' production costs nor include the externalities of food production. In parallel with the production of agricultural goods, agricultural activities generate negative (social costs) or positive (amenities) externalities that the market does not take into account.

The way that performance is measured in agriculture was seen as a key obstacle to the agroecological transition. Measuring success solely on annual yield is not appropriate because this does not factor in all the impacts of agricultural models that focus only on productivity or economic margins, without taking into account the long-term effects and internalizing the environmental and social costs that they incur. Beyond yield, performance assessment of a system should include environmental, economic and social dimensions. This includes for instance the impact of food production on water quality, pollination or including social and economic benefits for farmers and health impacts. Efforts are being made in full-cost accounting and externalities of food systems, such as The Economics of Ecosystems and Biodiversity (TEEB), which could feed policy-making processes. The positive impacts of agroecology on not only the environment but above all on the economic and social side are not sufficiently 'visible', which hampers the official implementation of proactive support for transition. It was emphasised that increased data on externalities is needed to reverse the dependency on subsidies that support conventional farming, despite the high costs to society.

Participants in all regions often stated that agricultural and agri-food advisory, research and innovation systems were not adapted to agroecology. Agroecology implies a change not only in the content of knowledge but also in the way it is acquired and in knowledge production

and innovations. The system that has been created (research, training, knowledge, equipment, investment networks) reinforces itself and is a major structural barrier to any alternatives to the dominant model, such as agroecology.

THE ACTORS OF AGROECOLOGICAL TRANSITIONS

Social mobilization was the subject of several debates that brought to the fore the high expectations around agroecology. Social mobilization is a key factor in facilitating the transformative potential of agroecology, since it is the sum of local transformations and innovations that will lead to a global transformation. Some participants also expressed a degree of impatience and distrust about a transformation that is often discussed but is either not yet enacted or has gone in a different direction.

The social dimension obviously differs greatly from one continent to another. Latin America has spearheaded this social mobilization, with agroecology developing around small-scale producers and civil society since the 1960s in response to the social, cultural, economic and environmental effects of the rapid development of the Green Revolution model and the industrialization of agriculture. In this region, more so than elsewhere, agroecology is bound to family farming, the human right to adequate food, and the food sovereignty of peoples.

A host of regional and sub-regional agroecology organizations (MAELA, CLOC/Via Campesina[3] and COPROFAM[4], among others) federated in 2013 in an Alliance for the Food Sovereignty of the Peoples of Latin America and the Caribbean.[5]

Civil society organizations are organising themselves at the global level to define common priorities regarding agroecology. In February 2015, representatives of smallholder organizations, indigenous peoples and social movements met at the Nyéleni Training Centre in Sélingue, Mali, and drafted the Nyeleni Declaration on Agroecology in preparation for the FAO regional seminars (organised by the International Planning Committee for Food Sovereignty). This Declaration is a pillar of civil society's vision of agroecology and was highlighted in every FAO regional seminar by its representatives. It stresses that the collective knowledge of peasants and indigenous peoples, including that of women, lies at the heart of agroecology.[6]

Researchers have always played an important role in the development of agroecology. A letter from over 70 international scientists to FAO at the 2014 Symposium[7] revealed that growing numbers of scientists are committed to supporting the transition that they deem essential to ensuring sustainable food systems. Some large research institutions have put agroecology at the centre of their strategy (e.g. INRA and CIRAD in France). In Europe, a network of researchers has been created – Agroecology Europe[8] – representing the largest universities in the sub-region with the aim of promoting the agroecology agenda. In Latin America, agroecology has been developing as a science since the 1980s, with the creation in 2007 of SOCLA[9] (Latin American Scientific Agroecology Society), which has over 750 members and has already held five regional agroecology congresses.

Networks of actors and experience sharing platforms are emerging in all regions in various formats, and the participants of all seminars unanimously called for such networks to be created on larger scales, i.e. at national, sub-regional or regional level, to boost their prominence and effectiveness. Although such networks may be sectoral, such as networks of researchers, there is a trend towards ensuring a global vision and multistakeholder exchanges to foster innovation and co-creation by setting up thematic networks of farmers, researchers and citizens. These networks or platforms can be either physical or virtual. New technologies and in particular mobile exchange applications allow for significantly more direct exchanges between producers and for horizontal training.

In sub-Saharan Africa it was acknowledged that the private sector has an important role to play, for example in providing biofertilizers in small packages appropriate for small-scale family farms, developing and commercializing biological pesticides, and employing women in the product processing sector. The fact that the principles of agroecology pay particular attention

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3 www.cloc-viacampesina.net

4 www.coprofam.org

5 www.alianzasoberaniaalimentaria.org

6 www.foodsovereignty.org/wp-content/uploads/2015/02/Download-declaration-Agroecology-Nyeleni-2015.pdf

7 www.iatp.org/files/2014.09.17_AgroecologyFAOLetter.pdf

8 www.agroecology-europe.org

9 www.socla.com

Box 2 **Public agroecology policies in Brazil, China and France**

The National Policy on Agroecology and Organic Agriculture of Brazil (2012) is a precursor in the field and gave rise to a federal agroecology support programme. This programme addresses the dissemination of agroecology from varying angles including financing, marketing and institutional markets, technical assistance, university training, and research. Since then, a second National Plan on Agroecology and Organic Agriculture for the 2016–2019 period aims at increasing the number of family farmers that produce food through agroecology to one million by 2019. Other countries in the region that have supported agroecology with similar policy packages include Bolivia (Plurinational State of) and Cuba.

At the FAO International Symposium on Agroecology and Sustainable Food Systems held in China in August 2016, China presented the challenges it faces, which include increasingly severe resource constraints, environmental pollution issues that have yet to be solved, and the need for robust political support. In May 2015, the State Council of China published a National Strategic Plan for Sustainable Agriculture Development (2015–2030), which was followed by the State Council's Guidelines for accelerating the transformation of China's agricultural development mechanisms, issued in August 2015. The General Strategies for Ecological Civilization Reform issued by the State Council in September 2015 also addressed green and ecological production.

The 'agroecological project for France' (a law on the future of agriculture, food and forestry adopted in October 2014) endorsed a transition to enhanced economic, environmental and social performance in agriculture. The government announced its will to privilege farm autonomy and improve farm competitiveness by maintaining or increasing economic profitability, improving the added value of production and reducing consumption of energy, water, fertilizers, plant protection products and veterinary medicinal products, in particular antibiotics.

to farmers' autonomy and rebuilding local and territorial spaces means that certain parts of the private sector will be more engaged than others (for example small and medium-sized enterprises that are more accessible to smallholders and responsive to their needs rather than large transnational companies). Clearly, the role of the private sector in the agroecological transition has to be further explored, including for example, with regard to innovations.

At market and consumption level, the increased diversity of products on agroecological farms means that producers and their organizations must be more autonomous in their marketing strategies, relying less on commodity supply chains and more on price negotiation based on quality and variety, and consumer engagement. This entails creating new modes of consumption and marketing, with consumers who are more informed about the advantages of agroecological products. In fact, consumers can be a major driver of transformation. Supplying agroecological products to large cities remains a challenge in terms of both identification and logistics for agroecology in the coming years, in parallel with an increase in the number of producers involved in agroecological processes.

The role of governments is fundamental for transitions and public policies were at the centre of the debates. A number of countries have adopted policies and programmes that may

contribute to the transition to sustainable agriculture and food systems. Few, however, have put in place policies that specifically refer to agroecology. The main features of such policies are their comprehensive nature, participatory and context-specific approaches, inter-disciplinarity and transformative intent. Transitions must be a global process and therefore international intergovernmental organisations like FAO would have an important role in supporting transition processes.

Observations on the public policies implemented in three countries in different continents (Brazil, France and China) showed how agroecology's comprehensive approach allows multiple issues to be taken into account. The Brazilian approach was initially socially motivated to support family farming and indigenous peoples; the French approach sought to enable a transition towards greater farm resilience, particularly at the economic level with the aim of increasing energy autonomy, local jobs and improving the environment; and the Chinese approach was driven by major environmental constraints and focuses on efficient input management to reduce the pressure on the environment.

Agroecology is based on a multicultural dialogue between scientists, farmers and citizens and is a living concept that is still being adapted.

SECTION 2

AGROECOLOGY FOR FOOD SECURITY AND NUTRITION: KEY ISSUES FROM THE SEMINARS

- THE NATURAL RESOURCE BASE
- ACCESS TO NATURAL RESOURCES (LAND, WATER, FISHERIES, FORESTS AND GENETIC RESOURCES)
- CLIMATE CHANGE AND RESILIENCE
- BALANCING POWER THROUGHOUT THE FOOD SYSTEM
- CAPACITY BUILDING AND KNOWLEDGE SYSTEMS
- GENDER EQUITY
- PRODUCING MORE WHERE IT IS NEEDED
- NUTRITION AND HEALTH
- INCOME-EARNING OPPORTUNITIES IN RURAL AREAS, PARTICULARLY FOR YOUNG PEOPLE
- TERRITORIAL APPROACHES FOR SUSTAINABLE FOOD SYSTEMS

The FAO regional seminars on agroecology took place in a context where some 815 million people still suffer from hunger in the world, while losses and waste account for nearly 30 percent of agricultural production. Of the 815 million hungry people in the world (FAO, 2017f), paradoxically, 70 percent are farmers who make their living from agriculture, fisheries and forestry. FAO has recently warned that in a business-as-usual scenario, it will not be possible to achieve SDG 2 on eliminating hunger in Africa or Asia by 2030, or even 2050 (FAO, 2017d). Agroecology offers a holistic approach to transforming food systems. The explicit focus on the social and economic dimensions of food systems is a specific characteristic of agroecology compared with other approaches to sustainable agriculture. Agroecology takes a human rights-based approach, with a strong focus on equity and the rights of women, youth, and indigenous peoples, while prioritizing support for small-scale and family farmers.

The regional seminars discussed a range of topics related to agroecology, its impact and the challenges if faces. From these broad discussions, a number of key issues emerged across all regions, highlighting both challenges and opportunities.

THE NATURAL RESOURCE BASE

The degradation of natural resources and biodiversity, and the impact of large-scale food production dependent on external inputs were at the heart of the debates. The Green Revolution is credited, especially in Asia, with having jump-started economies and alleviated rural poverty, but this came at a high price in the long term (FAO, 2011).

The depletion and renewal of the basic resources needed for agricultural production is a major problem in every region of the world, with the loss of agricultural and wild biodiversity, loss of land available for farming, and soil degradation, desertification, deforestation, depletion of fisheries resources, and degradation of the quality of surface and groundwater.

Declining biodiversity and reduced soil fertility compromise the provision of ecosystem and non-market services in natural environments: carbon storage, photosynthesis, water regulation and purification, as well as the productive capacities of agricultural and pastoral lands.

In Europe and Central Asia, participants agreed that a large quantity of food is produced as commodities with many negative consequences related to nutrition, the environment and social and cultural values at the local and global level. The carbon and ecological footprints of these linear and globalized agrifood systems reach levels of consumption that exceed safe planetary limits, weakening resilience to environmental change and adversely affecting public health.

Declining productivity is contributing to the vulnerability and impoverishment of rural societies and a rural exodus, while increasing conflict-related social tensions over access to natural resources and fertile land.

Box 3 Agroecosystem diversification in Mexico

In Mexico, the University of Veracruz conducted a project (2013-2015) in a marginalized indigenous region in southern Mexico, where monocropping was reducing the traditional richness of agroecosystems, drastically changing the land use and increasing erosion rates. Based on traditional soil classification, the project sought the reforestation of perennial tropical forests in 40 small parcels (0.5 ha each). The peasants participated in selecting the plants (mainly native species), selecting the species of upper native trees to collect high quality seeds, setting up five community nurseries, and designing and establishing a system to enrich their plots and switch to agroforestry. The peasants diversified their land with up to 16 tree species and designed a set of practices, with the adoption of level curves and hedgerows, crop rotation and maize coverage crops, diversity of shade species in coffee and silvopastoral systems. Of the species considered, 69 percent have honey potential. Through participatory workshops (30 percent of participants were women) and surveys of local markets, a flowering calendar was obtained to support bee feeding and fruit production, and its productivity and economic contribution was estimated, calculating a potential increase in income of up to 200 percent in coffee systems.

Agroecology aims to restore a diversity of species to agroecosystems to optimize ecosystem services. This entails improvement of soil life and fertility, natural regulation of parasites and predators, and more efficient use of space and light energy through a combination of species and nutrient recycling. Numerous examples presented during the seminars illustrated how agroecological practices have enabled production and environmental preservation to be reconciled, with the restoration over time of productive soils in degraded areas and the re-establishment of ecosystem dynamics that foster natural pest and disease regulation.

By gradually decreasing input use, replacing chemical and industrially processed inputs with natural inputs and recreating a system that is as autonomous as possible, agroecological transition allows farmers to get closer to the optimum functioning of ecosystems, intensifying the services that ecosystems provide. Little by little, ecosystem services are entirely or partially replacing external synthetic inputs (pesticides, mineral fertilizers, veterinary drugs) and thus eliminating their negative impact on the environment, biodiversity, soil fertility, and the economic resilience of farmers. Agroecology is therefore underpinned by sharing space, where agriculture works in harmony with, rather than against, nature and is akin to "land sharing" (Perfecto, Vandermeer, 2010).

Agroecology therefore offers relevant options and solutions for reaching the objectives of the Paris Agreement on Climate Change, the Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification (UNCCD).

ACCESS TO NATURAL RESOURCES (LAND, WATER, FISHERIES, FORESTS AND GENETIC RESOURCES)

Food producers' unequal access to natural resources endangers their food security. Concerns were raised in all regions about family farmers' decreased access to land a water resulting from farm expansion and concentration of control of resources through the actions of private and public actors, whether national or international. The threat to small-scale fisheries was noted in Africa and Asia, in particular, as was farmers' loss of access to genetic resources and agricultural biodiversity. Access to natural resources has been defined as the processes by which people, individually or collectively, are able to use natural resources, including land, water, fisheries, forests, and genetic resources, whether on a temporary or permanent basis (FAO, 2008).

There is reason to believe that access to natural resources will be under even greater threat in the future. Projections to 2050 suggest that natural resources for agriculture will become increasingly scarce (Alexandratos, Bruinsma, 2012). Intensified competition for these resources could lead to their overexploitation and unsustainable use, degrading the environment and creating a destructive loop whereby resource degradation leads to increasing competition for the remaining available resources, triggering further degradation. For millions of farmers, foresters, pastoralists and fishers, this could create insurmountable barriers to livelihood improvement and the escape from poverty. Although agriculture at the global level has become more efficient, in recent decades, competition for natural resources has intensified owing to consumption patterns driven mainly by population growth, changing dietary patterns, industrial development, urbanization and climate change. Land degradation, deforestation and water scarcities are among the most visible manifestations of this unsustainable competition (FAO, 2017e).

Box 4 Access to land in Mali

Farmers in Mali have gained critical new rights to their traditional land – and rural communities have gained much-needed economic stability – as a result of a historic new law *(Loi 2017-001 du 11 Avril 2017 portant sur le Foncier Agricole)*. This is the first time in the legislative history of Mali that a law has been specifically enacted to deal with agricultural land. The largest platform of peasant organizations in Mali, *la Coordination Nationale des Organisations Paysannes* (CNOP), was very active in contesting land governance and was a partner of FAO on a project to apply the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT). CNOP facilitated the national multi-actor platform known as "framework for dialogue and action on land governance in Mali". This platform was established in 2014 and created a space for a wide range of actors to discuss changes to the land law. Thanks to this long process of dialogue, a new agricultural land law approved on 11 April 2017 is strongly rooted in the VGGT.

Access to natural resources was presented as crucial for the development of agroecology. This means ensuring access to natural resources, notably land, water and biodiversity, for producers, especially women, youth and indigenous peoples. If people do not feel secure, with no means to acquire land due to the privatization of land, water and biodiversity, the rural exodus will continue, with dramatic consequences in terms of impoverishment and loss of autonomy. A participant from Mali pointed out the role of communities in the conservation of biodiversity. If communities have control over what they produce, they are able and willing to invest in agroecology, harmonize practices with the natural ecosystem, and create economic dynamics that support women and mitigate the rural exodus of youth. Asia is home to two-thirds of the world's indigenous peoples and more than 2 000 civilizations and languages. The rapid globalization of the food sector and threats from large-scale commercial agriculture and extractive industrial production have had a calamitous impact on indigenous peoples and family farmers in the region.

CLIMATE CHANGE AND RESILIENCE

The threat of climate change is one of the biggest challenges faced by producers and was highlighted in all regions. In fact, climate change is a crosscutting priority for the 2018 FAO Regional Conferences. Climate change increases the vulnerability of producers who are already struggling to cope with the degradation of and competition for natural resources. Climate change was recognized as a key driver of the increased interest in agroecology. According to the Director-General speaking at the regional meeting in Europe and Central Asia, "there is not a trade-off: in agriculture, we can mitigate while we adapt, and there are no better examples than agroecology techniques." By enhancing biodiversity and increasing soil quality and fertility, an important contribution is made to the adaption to climate change and to carbon sequestration.

Agroecology supports resilient agroecosystems. Enhancing ecosystem services with diversification at farm and landscape levels (mixed or intercropping, crop rotation, agroforestry, crop livestock integration, hedgerows, corridors etc.) contributes to the creation of more stable, resilient and productive agroecosystems, ensuring yield stability in the midst of climatic variability. Soil management (cover cropping, green manure, mulching, manure and compost application, conservation agriculture) and soil conservation practices (contour farming, living barriers, terracing etc.) combined with diversification, contribute to the enhancement of soil fertility, soil water-holding capacity, carbon sequestration and protection from erosion. In the region of Latin America, for instance, evidence was cited from the last 20 years of the resilience of agroecological systems after extreme climatic events, which is closely linked with high levels of on-farm biodiversity (Box 5). A clear focus was placed on adaptation during the seminars, but the strong potential for mitigation of agroecology was also recalled in the context of the "4 per 1 000 initiative",[10] since carbon is stored in soils and water and there are fewer carbon dioxide emissions due to lower use of synthetic inputs and effective management of natural resources (Saj *et al.*, 2017).

Agroecology also strengthens farmers' adaptive capacity to climate change: knowledge building is at the heart of resilience thinking. Through the co-creation of knowledge and participatory breeding initiatives, farmers and experts come together to share knowledge on crop varieties and livestock that are more tolerant to climate variability. Agroecology, which is rooted in participatory and territorial approaches, advances the diversity of knowledge, promotes social networks, and places farmers' needs and local contexts at the centre of innovation and knowledge systems. The inefficient energy ratio of the agrifood system was highlighted in Europe, where ten calories are needed to produce the equivalent of one food calorie (Leach, 1976). The priority is to develop agricultural practices that consume as little energy as possible by drawing on the principles of traditional systems, which are highly energy efficient. A shift from non-renewable energy (i.e. fossil fuels) to renewables was a high priority in the discussions.

[10] **www.4p1000.org**

Box 5 **Performance of biodiverse agroecosystem under extreme climatic events in Central America**

A survey conducted in Central American hillsides after Hurricane Mitch showed that farmers using diversification practices such as cover crops, intercropping and agroforestry suffered less damage than their neighbours cultivating conventional monocultures. The survey, spearheaded by the *campesino-a-campesino* movement, mobilized 100 farmer–technician teams to carry out paired observations of specific agroecological indicators on 1 804 neighbouring sustainable and conventional farms. The study spanned 360 communities and 24 departments in Nicaragua, Honduras and Guatemala. It was found that sustainable plots had 20–40 percent more topsoil, greater soil moisture and less erosion, and experienced lower economic losses than their conventional neighbours (Nichols, Altieri, 2015).

Response of monocultures compared with biodiverse farms to hurricane damage in Honduras

(A) Farms under monoculture exhibited high levels of damage in the form of mudslides.

(B) Neighbouring biodiverse farms featuring agroforestry systems, contour farming, cover crops etc. exhibited less damage.

BALANCING POWER THROUGHOUT THE FOOD SYSTEM

In all regions, issues linked to globalization arose frequently. For example, farmers with vastly different productivity and competitiveness frequently. For example, compete with each other and with the international market, but they also face liberalization processes and trade regulations that have an impact on protection and support policies, to the detriment of local agriculture and employment. In the Near East, participants pointed out that export-oriented agriculture focused public and private support on a handful of crops cultivated as monocultures, rather than on integrated agroecological landscapes.

The agricultural and food sector is characterized by a wide variety of scales, and diverse degrees of economic concentration at the various stages of the food chain. This situation often leads to inequalities within the food chain, especially between large-scale, organized actors (such as big grain companies and large retailers), and smallholders for whom collective organization is a challenge. Concentration of landownership in the hands of big agro-business, to which large-scale land deals contribute, can condemn landless rural families to a life in poverty. All these inequalities have a strong effect on the economic governance of the food system, which in turn generates inequalities of power (HLPE, 2014).

In Europe and Central Asia it was noted that the increasing concentration of power generates undue influence over trade negotiations, law and regulation drafting, and control over knowledge. Many participants considered this to be problematic for the sovereignty of countries and food and nutrition security.

A concrete example was mentioned in agricultural supply or agribusiness, where six companies control 70 percent of the seed market and four companies control 72 percent of the pesticide market (FAO, 2017c). Participants regretted that family farmers' power was continuously decreasing due to multinational companies that produce synthetic inputs and patented seeds or have the logistical capacity to manage huge commodity flows, or due to supermarkets and other large-scale retailers that have the power to determine food prices.

The agroecological model is based on shifting power in the food system towards the territory and the local actors that are managing the commons. Unless underlying efforts are made to reduce inequalities in access to factors of production, knowledge, markets and subsidies, production increases will not necessarily lead to a reduction in hunger. Rural areas need to receive their fair share of appropriate public goods (infrastructure, health, education etc.).

Strengthening accountability in governance, and bringing control over food systems to the local level is one of the priorities for many supporters of agroecology. Counterbalancing these situations requires improving governance, including through more inclusive social participation and empowerment, with states playing a leading role in ensuring the human rights, including the Right to Food in the context of national food security.

The participants of the seminars insisted that the approach should not be compartmentalized by value chain but rather integrated, taking into account the territory and local issues to provide a more appropriate answer to local needs. Understanding a territory and how it works and making the best use of human and natural resources are the key to the balanced development proposed by agroecology.

It is essential to support farmers' organizations in their training processes and empower farmers through capacity building, social protection, and access to products and markets, in order to give them the opportunity to benefit from available opportunities and make them more resilient to climatic and economic variations. Agroecology is part of this strategic approach as it aims to place producers and consumers back at the centre of the agricultural decision-making system.

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CAPACITY BUILDING AND KNOWLEDGE SYSTEMS

The high level of heterogeneity in smallholder farming systems means that agroecology must seek to develop options for diverse contexts. That is why agroecology values the situation-specific knowledge and innovations of farmers that allow them to develop in unpredictable and changing circumstances. Innovations for agroecology are developed and strengthened through a range of initiatives that can be described as farmer-led, scientist-led and participatory. Producer training – via exchange networks of farmers and participatory research – is at the heart of the transition to agroecology. In the Near East, it was highlighted that networking between food producers, such as pastoralists, is very important at national, regional and international level, even more so because knowledge sharing on a wider spatial scale is needed for adaptation to climate change. A number of farmer research networks have been established in Asia, Latin America and Africa.

Many examples showed how these innovations can be strengthened with the support of researchers through the co-creation of knowledge. Innovation is more than the invention of new technologies and products; it also entails facilitating innovation processes that can stimulate new ideas, technologies, products and practices from a variety of actors, especially from farmers.

Interdisciplinarity and transdisciplinarity are at the core of agroecology and, as such, should also be key in education, research and learning processes. Researchers are organizing themselves in agroecology research platforms that offer the opportunity for reflection, discussion and scientific exchanges between researchers, practitioners, extension agents and farmers. These exist at regional level, such as SOCLA in Latin America and Agroecology Europe, and at national level, such as the IPM-FFS research platform in Indonesia.

Participatory research has many advantages: the research topic reflects farmers' real needs, which increases its likelihood of being adopted; furthermore, participation results in more varied innovations as well as training and capacity building for both producers and researchers. The seminars sometimes revealed a certain distrust and lack of understanding about the importance of research in agroecological transition. While often the result of knowledge gaps, this mistrust sometimes stemmed from negative experiences, where farmers perceived that their knowledge had been used unilaterally and without recognition. For this reason, some form of moral contract or legal protection of knowledge to formerly recognize farmer innovation is needed, as delete proposed in Africa or Asia, to facilitate cooperation and trust between farmers.

Participants in all regions stressed that the implementation of a "technological package" that is not adapted to local contexts and which implies buying seeds, fertilizers, pesticides and machinery, has led to a loss of farmers' autonomy, increasing their dependency on external inputs and reducing their capacity to solve problems unique to their agroecosystems. Furthermore, coupled with the introduction of monocropping, these technologies have harmed the environment, placing producers in a vicious cycle of dependence and aggravated poverty.

State disinvestment in certain regions, particularly due to structural adjustment policies in previous decades, has led to a lack of support for farmers in the field, as is the case in sub-Saharan Africa. For many family farmers and especially smallholders,[11] support is still either too weak or lacking altogether. Private companies have often stepped in to fill the gap, but often they are not promoting sustainable practices. In addition, much traditional agricultural knowledge has been lost from one generation to the next due to the introduction of the Green Revolution's turnkey techniques, which in some cases have replaced traditional approaches. In Europe and Central Asia, participants deemed it important to ensure that innovations and the products of research remain in the public and collective realm. Essentially, this means avoiding intellectual property rights and regimes and other forms of enclosure of knowledge and processes of commodification. Open innovation and data are increasing concerns, as there are wide gaps in political and ethical frameworks for data ownership. Good data held by practitioners on agroecology, not only in terms of food production but also adaption to climate, soil preservation and biodiversity, need to be protected. Defining or developing ethical protocols covering data was seen as a priority.

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[11] As stated in the 2013 HLPE report, *Investing in smallholder agriculture for food security:* "We consider a smallholding to be an agricultural holding run by a family using mostly (or only) their own labour and deriving from that work a large but variable share of its income, in kind or in cash. The family relies on its agricultural activities for at least part of the food consumed – be it through self-provision, non-monetary exchanges or market exchanges. The family members also engage in activities other than farming, locally or through migration. The holding relies on family labour with limited reliance on temporary hired labour, but may be engaged in labour exchanges within the neighbourhood or a wider kinship framework. Reciprocal relationships are important here for product or productive factor exchanges."

In all regions, the importance of taking into account innovation in the broadest sense was highlighted. Participants stated that social and institutional innovations, in addition to conceptual and methodological innovations, are just as important as technical innovations for producers.

Box 6 The peasant agroecology schools of La Via Campesina

In order to amplify agroecological transitions beyond the scale of individual farms, the global peasant movement, La Via Campesina (LVC), is creating broad social processes of experimentation, innovation, recollection, sharing and multiplication of agroecological methods, led by farmers. LVC's peasant agroecology schools are flexible and can be made relevant to each specific context; all LVC schools adopt a combination of technical and political education, practice and theory. The peasant-to-peasant (PtP) method is a combination of various methods of peasant-led, horizontal learning; in many cases, it has produced self-catalysing processes of agroecological transition at local, regional and national level. The combination of PtP processes and schools for permanent training and practice-based reflection makes for a strong strategy for scaling out agroecology. Social movements and member organizations of LVC have begun to create peasant agroecology schools (PAES) across the globe, currently operating some 65 such schools, including in Mali, Mozambique, Niger, Zimbabwe, Chile, Colombia, Haiti, India, Thailand, the Republic of Korea and Spain (La Via Campesina, 2017).

GENDER EQUITY

Globally, women make up almost half of the agricultural workforce. They also play a vital role in household food security, dietary diversity and health, as well as in the conservation and sustainable use of biological diversity. In spite of this, women remain economically marginalized and vulnerable to violations of their rights and well-being, and their contributions remain invisible and unrecognized. This is the case in the Asia and the Pacific Region, where women play a diversity of roles from food production to processing and marketing, and from provision to preparation and distribution. Climate change, extreme weather conditions, and the migration of farmers – mostly young and male – to cities for more gainful employment have created a huge labour gap in the agricultural sector. This has resulted in the "feminization" of agriculture in many countries, where the elderly and women carry out most farming and household chores. The female share of the agricultural labour force ranges from 35 percent in Southern Asia, to 43 percent in Southeast Asia, to 48 percent in East Asia and 52 percent in the Pacific.

Box 7 **Rural women in India organize collectively to gain self-reliance through agroecology**

The approximately 100 000 members of the Tamil Nadu Women's Collective come from disenfranchised sectors of society, particularly the widowed, landless and Dalit women. Founded in 1994, the Collective has set up various initiatives to empower women, including through agroecological approaches known local as "natural farming" or "zero budget natural farming". The model collective farms serve as demonstration plots for collective farming, ecological farming techniques and seed banking for use by those who visit for training. They support women in starting new collective farms, thus directly addressing the problem of lack of access to productive resources and land. The collectives are a way for women to gain access to land and provide food for their families through sharing a plot of land with other women in the community. Savings are also generated collectively, thereby overcoming the problem of lack of access to credit. Agroecology is a key vehicle to increase self-reliance and food autonomy. Thus, broadly, there is a positive correlation between agroecology and women's empowerment. However, studies have also shown that this positive correlation needs to be triggered by concerted efforts to engage, train and empower women, including as leaders and coordinators. In many other agroecology movements, in spite of their participation in high numbers, women tend to be identified as wives of farmers rather than farmers and leaders themselves. Hence, spaces and agency for women are limited and they are not able to promote any activities or spaces specifically for themselves, according to a study on the Zero Budget Natural Farming movement (Khadse, 2017).

Agroecology can help rural women in family farming agriculture to develop higher levels of autonomy through knowledge, collective action and some levels of commercialization. Agroecology can open spaces for women to become more autonomous and can empower them at household and community levels and beyond, for example, through participation in farmer and producer groups. Empirical analysis also shows that women's participation is essential for agroecology and its expansion, and that frequently women are the leaders of agroecology projects. Because agroecology involves diverse working tasks, specialized skills and specific knowledge, women often have a more diversified role in the household economy. In contrast to intensive farming based on external inputs, there are now a diversity of decision-making and income-generating roles, all of which work to reduce the weight of patriarchy inside the family unit. Because learning from each other and sharing are at the core of agroecology, it increases the spaces and opportunities for meeting, and builds social cohesion. Such spaces, especially women's spaces, provide opportunities for mobilization in favour of various causes, including gender equality and the strengthening of solidarity and social cohesion.

With its low start-up and production costs, and stable yields over time, agroecology makes farming less risky, more affordable and more accessible to women. Agroecology can also create high-value products for the market and improve incomes. The integration of livestock with farming (and fodder production) is also promoted, and is beneficial for women, improving nutrition, increasing food and providing additional income. Further, direct access to a diversity of crops, fruits and livestock products promotes the food and nutritional autonomy of families. Agroecology is based on the improvement of functional biodiversity on the farm.

It also encourages local seeds and crop varieties suited to the local climate and associated with traditional peasant knowledge. This gives a greater role to women, who often are the keepers of seeds and traditional knowledge.

PRODUCING MORE WHERE IT IS NEEDED

Boosting production is a requirement, but is not sufficient to tackle hunger, since availability is only one of the four pillars needed to achieve food security, the other three being access, utilization and stability. In the seminars it was considered a priority to increase the quantity and quality of production where needed and to generate decent employment and incomes in rural areas. Increasing worldwide production without a differentiated approach often leads to negative consequences: more waste, more power for those already holding power, and a detrimental effect on the image of food products.

The development of agroecology is expected to increase production in countries and areas where it is most needed. Many civil society and research organizations are increasingly highlighting the ways in which agroecology can simultaneously improve sustainability and

production. The largest study on the productivity of small-scale farmers that apply good practices for organic, agroecological and other sustainable agriculture – using either no or minimum chemical and inorganic fertilizers – covered 12 million farms in 57 countries. The average increase in yields using improved cultivation methods was 79 percent. In Africa, the average increase was 116 percent and in East Africa it was 128 percent (UNEP-UNCTAD, 2008). Another study with results over a period of three to ten years covering 10 million farms with some 12.75 million ha of land in 20 African countries, found that yields more than doubled using these sustainable and improved cultivation methods with little or no chemical fertilizers and chemical pesticides (Pretty, Toulmin and Williams, 2011).

In Asia and the Pacific, the positive effects of agroecology on yield gaps have been widely documented under the FAO Regional Rice Initiative and Save and Grow paradigm with the following results:

- Sustainable intensification of rice-based farming systems in the Philippines showed an average 30 percent increase in yield and over 30 percent reduction in costs, resulting in a close to 60 percent increase in net income. In Central Java and Indonesia, farmers increased rice yield by 20 percent, whereas input cost savings were variable. Returns in investments increased up to 57 percent, primarily resulting from higher farm-gate prices for certified organic rice (FAO, 2014).
- In the Lao People's Democratic Republic, 1 562 Lao rice farmers in FFS (37 percent women) achieved yield increases (31 percent in 2015 and 29 percent in 2016), profitability increase (38 percent in 2015 and 42 percent in 2016), lower costs (-5 percent in 2016 for seed inputs only and -46 percent in 2015). Results assessment confirms adoption of Save and Grow practices among FFS graduate farmers with a cost saving of -38 percent and higher rice yields.
- In a review of 34 rice fish studies, FAO found that on average rice production increased by 0.5 tonnes per ha when integrated with fish, and revenue increased more than input costs (fish feed and seed), so that overall profit was almost doubled (FAO, 2017a).

NUTRITION AND HEALTH

Nutrition and health were seen in all regions as important benefits of agroecology. The standardization and industrialization of food products has led to public health concerns in all regions with regard to decreased nutritional value, the health impacts of pesticide and antibiotics residues, the effects of additives, sugar, salt and fat in processed food products, and the growing risks of antimicrobial resistance due to intensive farming practices. Paradoxically, alongside the scourge of hunger, overweightness and obesity is on the rise. In Latin America, issues related to being overweight have reached epidemic proportions: almost 360 million people – 58 percent of the population – is overweight, and obesity affects 140 million people, or 23 percent of the population (FAO, PAHO, 2017). Worldwide obesity has more than doubled since 1980.

In 2014, a staggering 1.9 billion adults were overweight, of which 600 million were obese (FAO, 2017b). Taking into account the fact that agricultural production must increase to feed a population of 9 billion in 2050, projections on agroecological models call for a change in eating behaviour by rebalancing the intake of plant and animal products, and reducing food loss and wastage (Muller *et al.*, 2017).

There is growing evidence suggesting that agroecology, implying diversified farming systems, facilitates diverse diets among producers, households and consumers through increased consumption of a range of important nutritional elements that are often lacking in diets based on staple cereal crops. Agroecology enables the diversification of diets and increases the nutritional intake of producing households without relying on the intermediary of international trade (Carletto *et al.*, 2015). During the Symposium in China, it was pointed out that biodiversity for nutrition is not limited to the diversity of crops or animals used as food, but also includes biodiversity in soils, pollinators and microbial diversity in the human gut. The role of pollinators in nutrition was highlighted. Seventy-five percent of all crops depend to some degree on visits from animal pollinators.

Some regions made specific references to livestock. Integrated livestock systems produce nutrition benefits. During the Near East consultation, it was noted that livestock grazing on rangelands are healthier and provide more nutrititous food for humans because they feed on natural plants. In the seminar for Europe and Central Asia, it was pointed out that agroecological systems including livestock made less use of antibiotics and opted to use local value chains, with a positive impact on controlling the spread of transboundary animal diseases, some of which can be transmitted to humans, and on antimicrobial resistance.

Box 8 Family farmers to produce nutritious food for school meals in Tunisia

Public procurement programmes and in particular, school feeding programmes, are an innovative way of linking support agendas to family farmers, good nutrition and agroecologial production. An initiative to support capacity development in the framework of the school feeding programme of Tunisia, coordinated by the Ministry of Education, the Ministry of Agriculture and the World Food Programme, aims to deliver nutritious and balanced meals as part of the national school feeding programme through:

1. Strengthening programme governance
2. Designing nutritious and balanced meals
3. Promoting community participation
4. Supporting nutrition education through school gardens
5. Fostering links with local agricultural production, particularly family farmers
6. Empowering women by creating revenue-generating opportunities for rural women

Amid concerns about food quality and in part due to the rise of social media, all regions have seen increased consumer awareness of these challenges and a demand for healthier, more ethical and environmentally friendly food. This provides an opportunity for agroecological products. In all regions participants agreed on the importance of harnessing the power of consumers to drive transformational change towards healthy food systems based on agroecology. The importance

of raising public awareness on the health and nutrition impacts of different food systems was mentioned in all regions, and specifically in Asia and the Pacific. It was pointed out that eating healthy food free of toxins would lead to lower health costs. Participants in China agreed that consumer awareness can play an important role in the transition, based on a deeper understanding of agriculture, biodiversity, nutrition, health and environment links. One example given was that of the Olympic Games, which helped to boost integrated pest management when they were held in China.

INCOME-EARNING OPPORTUNITIES IN RURAL AREAS, PARTICULARLY FOR YOUNG PEOPLE

The growing disengagement of young people from farming systems is a major challenge reiterated in all regions. Rural youth rarely see agriculture as a way out of poverty. The lack of young farmers' organizations was also highlighted as an issue in Asia. In Europe and Central Asia, reverting farmers' loss and erosion of income was presented as a serious challenge for food security and rural livelihoods. Despite the similar trend, there are regional differences. Countries in the South that have not achieved their demographic transition and have few manufacturing industries and even fewer service activities cannot absorb the workforce that would enter the job market if their agriculture were industrialized or mechanically intensified. In Africa, therefore, where the youth population is rising, it is important for the agricultural sector to offer attractive and profitable work alternatives. Africa's population will more than double in the next four decades (+1.4 billion), while the population is declining in China and Europe, and India is witnessing a significant decrease in population growth. Despite rapid urbanization, the population of Africa is still predominantly rural (60 percent on average) and will remain so until the mid-2040s.

In all regions, family farming and agroecology were considered a realistic and effective way forward, through, for example, reduction of heavy manual labour, promotion of innovative agroecological production and processing technologies, and endorsement of a positive image of agriculture. Agroecology could contribute to creating jobs for the thousands of young people who will join the labour market and for whom urban centres offer no employment opportunities. It can galvanize initiatives to support entrepreneurship in the fields of agricultural production, processing and sales, mechanization adapted to the local context and training, in particular strengthening agroecology training centres.

There are many ways in which agroecological systems can encourage smallholders' access to markets. This happens when institutional and organizational mechanisms implement institutional innovations that promote biodiversity and local food systems based on proximity. Examples of these mechanisms are participatory guarantee systems (PGS) and community-supported agriculture (CSA), which are gaining momentum across Asia and the Pacific. Other mechanisms include agricultural heritage products within GIAHS, geographical indications, and organic and

community-branded products, which have a steadily increasing market as food safety concerns rise among consumers in the region. From the public market generation perspective, public procurement was mentioned as an important and interesting way to promote agroecological transitions among smallholders and create local markets.

Box 9 Agricultural opportunities in rural areas for youth through agroecology

In Senegal, Mali and Niger, Terre et Paix is a partnership which brings together the three national farmers' platforms under the auspices of ROPPA (Network of Peasant Organizations and Agricultural Producers in West Africa). Thanks to the project, 60 young men and women from Senegal, Mali and Niger were trained to lead agricultural projects in their villages, and address social, environmental and economic challenges through agroecology. The training includes a holistic set of practices of integrated soil fertility management, sustainable small-scale animal husbandry and efficient use of water resources. Furthermore, over 40 ha of farmland were legally assigned by local administrative and traditional authorities to the 60 youths, to carry out agroecology projects. In the six rural communities targeted by the project, several plots are now managed using agroecological practices. The project is supported by the European Union, in collaboration with the Italian NGO COSPE.

Agroecological practices can create new rural employment opportunities for young people, for instance, to restore degraded lands (Pretty *et al.*, 2011). Agroecology requires a trained workforce and increased expertise to manage diversified productions and products, and therefore promotes processing and local sales of products, training and job creation. In Finland, agroecological symbiosis (AES) is a food and energy production system based on cooperation between food producers and processors. Bioenergy is produced *in situ* at the farm level, utilizing waste biomasses from (re)localized production and processing. After the bioenergy has been produced,

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the waste nutrients are recycled back into food production, which enhances local nutrient recycling. In addition to the biophysical benefits of this innovation, AES also strengthens the local community by providing jobs in rural areas and connecting consumers to food production.

TERRITORIAL APPROACHES FOR SUSTAINABLE FOOD SYSTEMS

For the transition towards sustainable food systems, agroecology must move beyond individual farms or projects. Isolated farmers' initiatives will not be effective in achieving the agroecological transition; an integrated, territorial approach is needed. As mentioned in the seminar in Europe and Central Asia, landscapes with small and medium-sized farms have demonstrated that they are better able to support local economies and farmers' well-being compared with landscapes characterized by the presence of larger export-oriented enterprises. Participants in Asia and the Pacific highlighted that transitions are most efficient at a territorial level and as a result of the bottom-up work of social movements. Territorial approaches mean that food is produced and consumed where it is needed most.

Agroecology is based on ecosystem services that are frequently mobilized on a scale exceeding that of the field and including: farm, landscape, watershed and regions. Therefore, agroecology underlines the importance of diversification at the landscape level. For example, controlling pests in one field requires consideration of several trophic aspects across the landscape; combating soil erosion on the slope of a watershed involves the improvement of the land's capacity to absorb water across the entire slope; and ensuring adequate pollination services requires the integration of diverse of pollinator habitats into agricultural landscapes. Landscape or territorial approaches are necessary to ensure sustainability in systems that are affected by agriculture.

In Europe and in other regions of the world, nitrate contamination of groundwater is particularly high. Improvement of drinking water catchments in agricultural landscapes can be achieved only by implementing a landscape approach.

The territorial approach is important for economic, social and cultural reasons. Farmers who are transforming their production systems need the cooperation of other farmers in the same area, for example to share machinery that is adapted to agroecology, or to acquire feed for their livestock from neighbouring farmers. Farmers who are in a transition to agroecology also emphasize the need for access to local markets, as they offer more favourable conditions than export-oriented value chains. Supporting local and territorial markets implies supporting local infrastructure, processing and storage facilities adapted to local markets. At the same time, diversified landscapes are attractive for tourists and therefore offer potential for diversification of rural incomes.

In Latin America, the territorial dimension was particularly important for indigenous peoples, whose traditional production systems and cultural identity are linked to the landscape. The same is true of pastoralists, as highlighted in the seminar in the Near East and North Africa.

Territorial approaches raise questions related to governance, since all relevant stakeholders within the territory need to be engaged and to take action based on coordinated policies and programmes. In sub-Saharan Africa and the Near East, local communities would have increased possibilities at territorial level to ensure accountability in public policies due to their proximity to decision makers.

Box 10 Italian "bio-districts" adopt a territorial approach for agroecological transitions

The organic movement in Europe started 30 years ago and has been a success story. However, although many farms have converted to organic, the approach has been fragmented. To push forward the transition, society at large must be involved and a dynamic must be created at territorial level. Organic farming is currently the main driver of the agroecological transition in Italy. In 2009, the Italian Association for Organic Agriculture (AIAB) launched the first bio-district in Italy as a territorial approach engaging all local actors. A bio-district is a geographical area where farmers, citizens, tourist operators, associations and public authorities enter into an agreement to sustainably manage local resources based on organic production principles and agroecology practices, with the aim of achieving the full economic and sociocultural potential of the territory. Each bio-district is characterized by lifestyle, nutrition, human relations and nature. As a result, agricultural products are more valued and typically characterized, hence more appreciated by the market. There are currently 27 established bio-districts in Italy and a further 27 are under development.

The Ministry of Agriculture included the agroecological approach and the bio-districts experience in its National Action Plan for Organic Farming (2016). Similarly to Italian bio-districts, "eco-regions' have been established in France, Austria and Switzerland, and an International Network of Eco-Regions was created in 2013.

There are many successful examples of agroecology at local and national level. Some of these have been reinforced by public policies, knowledge exchange networks, strengthened rural institutions and improved market access. The participants made recommendations regarding all stakeholders: public organizations, academia, civil society actors and even the private sector, whose collective mobilization was deemed essential to carry out the transformation. However, the numerous recommendations may also be sources of inspiration for decision makers wishing to develop new public policies or structure existing ones. Based on the results of the FAO seminars, this section describes the recommendations adopted by the stakeholders during the seminars. They are grouped into the four thematic areas that were most commonly used during the seminars. The recommendations form the basis for the proposal to scale up agroecology presented in Section 3.

SECTION 3

COMMON RECOMMENDATIONS FROM THE SEMINARS ON AGROECOLOGICAL TRANSITIONS

- STRENGTHENING THE CENTRAL ROLE OF PRODUCERS AND THEIR ORGANIZATIONS IN SAFEGUARDING, UTILIZING AND ACCESSING NATURAL RESOURCES
- FOSTERING EXPERIENCE AND KNOWLEDGE SHARING, COLLABORATIVE RESEARCH AND INNOVATION
- PROMOTING MARKETS FOR AGROECOLOGY-BASED PRODUCTS AND SERVICES
- REVIEWING INSTITUTIONAL POLICY, LEGAL AND FINANCIAL FRAMEWORKS TO PROMOTE AGROECOLOGICAL TRANSITIONS FOR SUSTAINABLE FOOD SYSTEMS

STRENGTHENING THE CENTRAL ROLE OF PRODUCERS AND THEIR ORGANIZATIONS IN SAFEGUARDING, UTILIZING AND ACCESSING NATURAL RESOURCES

Giving producers a central role in safeguarding, utilizing and accessing natural resources is one of the four priority areas that emerged from participants' discussions and recommendations. Five areas of action are described below:

- → Recognizing, preserving and utilizing traditional knowledge and culture
- → Promoting dynamic management of agricultural biodiversity and use of local and traditional crops and breeds
- → Supporting product diversification and integration of cropping, livestock, aquaculture and forestry
- → Restoring and enhancing soil quality and fertility
- → Guaranteeing access to and use of productive natural resources for small-scale producers (land, water, forests, fisheries and genetic resources).

RECOGNIZING, PRESERVING AND UTILIZING TRADITIONAL KNOWLEDGE AND CULTURE

The use of a very limited base for plant, animal and aquatic genetic resources in food systems jeopardises the resilience of our food systems. All regions recalled the central role of farmers in preserving and improving this heritage. They called for an acknowledgement of the multifunctional role played by small-scale agroecological producers in preserving soil, water and biodiversity, and in promoting rural development.

At the second FAO Regional Seminar for Latin America and the Caribbean (Recommendations 1, 2 and 3, La Paz), it was stressed that artisanal fisheries and the contribution of urban and peri-urban agroecological agriculture for food sovereignty and food security should be taken into account and highlighted.

The important role of Globally Important Agricultural Heritage Systems (GIAHS) in demonstrating how agroecology, culture, and innovation can work together was also highlighted in the FAO International Symposium on Agroecology and Sustainable Food Systems in China (Recommendation 21, Kunming).

The value of the natural, historical, cultural and local food heritage, as well as respect for human and social values, were recognized as key to develop contextualized approaches. In Latin America, participants noted that the recognition and value of ancestral knowledge, local wisdom and cultural identities are a pillar of agroecology (Recommendation 4, Brasilia). In a globalized world with a high level of standardization, this diversity of local history and traditions was seen as an important asset to value.

Beyond natural heritage, all regions emphasized the wealth of empirical knowledge that farmers and indigenous groups have amassed over time and stressed that this should be preserved. Agroecological systems were created thanks to the co-evolution of humans and nature, and as a result of multiple observations and experiments generating true expertise. This diversity of knowledge, which makes it possible to create and use genetic diversity, was the second key point in the discussions. It was noted that many farmers who were part of the Green Revolution have lost their empirical knowledge, in addition to the loss of genetic diversity. The agroecology movement is therefore moving towards recovering, analysing and sharing this knowledge that is useful to all humankind.

PROMOTING THE DYNAMIC MANAGEMENT OF BIODIVERSITY AND USE OF LOCAL AND TRADITIONAL CROPS AND BREEDS

All regions recognized the need to strengthen support for community-based seed and species management, on-farm selection, and revival of underutilized crops and breeds.

The effectiveness of agroecological initiatives depends on the development and often the rediscovery of genetic heritage in terms of crops, plants, animals and trees. A key recommendation from all regions was the use of local, forgotten or underutilized seeds. It was also stressed that farmers should select their own variety on farms, particularly in the context of resilience to

climate change. This ties in with the crosscutting issue of the importance of maintaining and restoring the seed autonomy of communities.

These elements concern both the practical and technical aspects of itemizing, collecting, developing and managing local genetic heritage, as well as genetic protection, and rights of access to and exchange of these resources, which often come up against political or trade regulation problems. With regard to seeds, the main obstacle is disproportionate certification procedures for small-scale farmers and even penalties that put producers outside the law. Technical support for communities is also necessary. The CoEx project launched by CIRAD in 2017 in West Africa seeks to remedy the institutional mismatch between policies and regulations on the one hand, and the range of crop diversity management practices on the other, by proposing governance mechanisms that make it possible to resolve the opposition between so-called formal and informal approaches.

In Asia, a specific recommendation underscores the importance of revitalizing traditional management systems and local varieties of staple foods with a focus on neglected or underutilized varieties (Recommendation 9, Bangkok). As such, under the FAO Future Smart Food project, four countries (Cambodia, the Lao People's Democratic Republic, Nepal and Myanmar) have now decided to make widespread use of neglected or underutilized species in their programmes.

The importance of women's role in preserving and developing seeds was highlighted in debates in all regions, notably in Africa and Latin America where the importance of the role of communities and women in maintaining biodiversity was set down in a recommendation (Recommendation 7, Brasilia).

Similarly, the promotion of local seed systems and *in situ* conservation – one of the levers to preserve seed availability and access which is so crucial for farmers – was noted in all regions. Latin America also underscored the direct link between seed management and the concept of food sovereignty (Recommendation 7, Brasilia).

In Europe, "Réseau Semences Paysannes" highlighted the importance of promoting on-farm dynamic conservation and management of genetic diversity, and of developing, multiplying and distributing locally adapted varieties well suited for low-input farming. With regard to seeds and the dynamic management of biodiversity, the new European Union regulation on organic production, adopted on 20 November 2017 by the European Council and on 22 November by the European Parliament, provides two new seeds categories. The first is "organic heterogeneous material" and the second "organic varieties suitable for organic production". This will allow organic farmers to use and reproduce hardy seeds that are better adapted to farming without chemicals, generating greater seed biodiversity.

Participatory selection also applies to tree and animal species and the development of research-supported participatory selection of animals is an important challenge for agroecology.

SUPPORTING PRODUCT DIVERSIFICATION AND INTEGRATION OF CROPPING, LIVESTOCK, AQUACULTURE AND FORESTRY

Diversification in space and time at farm and territory level is a key factor in restoring ecosystem services. Together with soil conservation and restoration measures, agroecology has huge potential to inject more life into soils, ecosystems and the countryside.

The diversification of species and genetic resources in the agroecoystem over time and space, from the field to the landscape level, is one of the core principles of agroecology. It fosters efficiency in the use of natural resources and synergies among the differing components, as well as contributing to self-regulation. The role of diversification in ensuring sustainable agriculture and the design of agroecosystems to mimic natural ecosystems with high productivity and resilience are growing fields of research. The synergies created by designing food systems with an optimal crop/animal relationship promote ecological functions for self-regulation. While maintaining natural resources and increasing the local potential of agroecosystems, diversification optimizes functional biodiversity above and below ground, limiting the population of bio-aggressors like weeds, pests and soil-borne diseases, taking advantage of biological cycles for nutrients, water and energy, and strengthening resistance to extreme climatic events such as drought.

It was pointed out in all regions that public policies – often focusing on crop specialization and intensification and encouraging sectoral organization – did not foster this transition towards more favourable practices to preserve and restore public goods and to give new impetus to territories. Farm diversification increases the resilience of farmers, but it means adapting supply, production and sales, which is not encouraged by public policies. Differentiated policies could support farmers who are reluctant to make this transition.

Ecosystem restoration means restoring the productive potential of agriculture to farmers by reactivating key ecosystem services such as pollination, biological control, erosion prevention soil fertility, carbon trapping and water circulation.

In Latin America, it was recommended that the conditions be created to reduce monocropping, use of agrochemicals and land concentration in order to push forward the development of diversified agroecological production in the region (Recommendation 13, Brasilia). In the Near East and North Africa, participants called for support for agroecological systems based on traditional agriculture, pastoralism and artisanal fisheries (Recommendation 2, Tunis).

RESTORING AND ENHANCING SOIL QUALITY AND FERTILITY

Tackling erosion and the degradation of soil quality and fertility as well as soil restoration are systematically presented as key issues for agriculture. In this regard, agroecology provides clear benefits: on-farm diversification; soil management and conservation measures, incorporating organic matter and entailing anti-erosion interventions; and reduced use of mineral fertilizers and heavy mechanization.

During the FAO seminars, particularly in Africa, participants underlined the potential of agroecology to enhance and restore degraded soils as well as to preserve the biological diversity of soils – which is still little known and implemented – as a way to build resilience to climate change.

The importance of preserving soil health, soil biodiversity and nutrient cycles was also explained in Europe. Soil health is essential for soil to function as a vital living ecosystem that sustains plant production. A significant scientific challenge is to provide science-based recommendations, adapted to local knowledge, to design cropping systems incorporating feedback processes that resemble ecological principles of sustainability. Agroecology aims to re-establish these regulatory processes, which not only operate at the local (farm) but also at the landscape level, to enhance and preserve soil health and biodiversity without compromising yield.

Many examples demonstrate that agroecological soil management is likely to lead to more stable yields, with a reduction in synthetic fertilizer requirements, better water absorption, increased profitability, and gradual progress towards improved soil organic matter and soil fertility. Notwithstanding, the paramount importance of more agroecological research was also reiterated.

GUARANTEEING ACCESS TO AND USE OF PRODUCTIVE NATURAL RESOURCES FOR SMALL-SCALE PRODUCERS (LAND, WATER, FORESTS, FISHERIES AND GENETIC RESOURCES)

Governance of natural resources was a key factor in all regions. Guaranteeing rights to natural resources (plant and animal genetic resources, land, water and territory, but also knowledge) was cited as a prerequisite for developing agroecology, with particular emphasis on women, youth and indigenous peoples. Access and land tenure has always been presented as vital for the survival of populations: long-term tenure must be secured together with the conditions created for producers to improve their land through soil management, production diversification, and integrated crop, animal and forest production.

More systematic implementation of existing tools, such as the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT) and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (VGSSF), was recommended. Compliance with Article 9 of the International Treaty on Plant Genetic Resources for Agriculture (ITPGRFA), the establishment of links with the Commission on Genetic Resources and working with the CBD were also recommended.

Seminar participants also insisted on the importance of the implementation of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization.

Access to land is a topic that resonates strongly in all regions. Problems were raised in this regard, but also solutions. The new Land Law in the Plurinational State of Bolivia facilitates access to land for women producers and promotes training in agroecology. Indonesia's Program of Land Distribution, developed with the participation of farmers' organizations that support agroecology, allocates 9 million ha to peasants and the landless.

The importance of access to natural resources, respect for fundamental human rights and indigenous peoples was also recalled in China (Recommendation 24, Kunming), Latin America (Recommendation 14, La Paz) and Europe (Recommendation 6, Budapest), with reference to international instruments and agreements, such as the United Nations Declaration on the Rights of Indigenous Peoples, as well as the declaration on the rights of peasants and other people working in rural areas, which is currently under negotiation.

FOSTERING EXPERIENCE AND KNOWLEDGE SHARING, COLLABORATIVE RESEARCH AND INNOVATION

Fostering experience and knowledge sharing, research and innovation is one of the four priority areas that emerged from participants' discussions and recommendations. Five areas of action are described below:

→ Developing farmer-led and participatory research and co-innovation

→ Developing interdisciplinary and transdisciplinary research and filling research gaps

→ Promoting technical, social and institutional innovations for agroecology

→ Setting up multistakeholder cooperation platforms

→ Investing in capacity development, including support for agroecology training initiatives among grassroots organizations.

DEVELOPING FARMER-LED AND PARTICIPATORY RESEARCH AND CO-INNOVATION

Agroecology is local and context-based; it is, therefore, essential to invest in observation and analysis on the ground. The way forward no longer requires a predefined system or a technological package provided through unilateral top-down knowledge transfer. On the contrary, it is important to work with local actors to analyse the local context and its potential, in order to build the most productive and environmentally friendly solution.

Co-innovation through recognition of farmers' traditional knowledge, experimentation and participatory research were presented in all regions as a priority for the development of agroecology research. Participatory research has many advantages: the topic of research reflects farmers' real needs, which increases the likelihood of it being adopted; and participation results in more varied innovations as well as training and capacity building for both producers and researchers.

Participants in Europe also recommended that farmers be paid for their time to facilitate their involvement, and be involved throughout the research cycle, including evaluation of research programmes and institutes (Recommendation 32, Budapest).

In Africa, the concept of a farmer–researcher network was proposed, echoing the need to strengthen actions such as those carried out for many years by the Collaborative Crop Research Program (Recommendation 16, Dakar).

This approach entails specific funding to enable researchers to physically work with farmers, and requires a prior contract of confidence between farmers and researchers. For this, some form of moral contract or legal protection of knowledge for farmer innovation is needed, as has been proposed in Africa or Asia, to facilitate cooperation and trust between farmers. The seminars sometimes revealed a certain distrust and lack of understanding about the importance of research into the agroecological transition. While often the result of knowledge gaps, this mistrust sometimes stemmed from negative experiences, where farmers perceived that their knowledge had been used unilaterally and without recognition.

With regard to the governance of research, in Europe the focus was on potential structural changes that could be undertaken by the research sector, including reforms in governance, training and methods of evaluation of researchers' work, which does not value participatory or interdisciplinary research and citizen engagement (Recommendation 31, Budapest).

The problem of data access with the necessary commitment to open data systems and the importance of preserving the public nature of environmental knowledge and data was noted in Europe as a prerequisite for developing agroecology (Recommendation 34, Budapest). Data provision is important not only for research purposes but also for building trust and real cooperation among partners, including farmers and social movements, to achieve greater knowledge. Open-source technologies were considered promising tools to foster collaboration and data exchange for agroecology.

DEVELOPING INTERDISCIPLINARY AND TRANSDISCIPLINARY RESEARCH AND FILLING RESEARCH GAPS

Agroecology systems are by definition complex. Their complexity increases their resilience, allowing for synergy between the components, with complementary use of light, water and food resources and available space, and entailing the mobilization of as many ecosystem services as possible to produce and recycle nutrients and regulate bio-aggressors and diseases. Integrated systems include combining crops – sometimes over 100 different varieties – with animals and agroforestry to create the most productive cycles possible. This paves the way for a new research era that is steadily gathering pace and requires increased investment on the ground and in dialogue. Agroecology requires extensive knowledge of ecosystem services, soil life, biogeochemical cycles, and all complex interactions related to the systems.

In all regions, above all in Asia, emphasis was placed on basic research to focus more on interdisciplinary and transdisciplinary aspects and on ecosystem services, as well as on the need for more specific public funds, as private funding is low in these areas.

Agroecological research is complex, because it is integrated and requires use of a model to conceptualize all the interactions between the various components of the agroecosystem.

It also factors in the long term, providing an understanding of the interactions between each dimension and how systems can be restructured.

In the Near East consultation, it was mentioned that research stations are traditionally located in areas with good soils, and when farmers fail to achieve the same results, they are held responsible. An agroecological approach to research adapts to complexity with farmers and scientists working together to co-create solutions, but such an approach takes time, whereas the demand is for quick solutions.

Co-design and co-innovation are essential: they should guide the research design by finding innovative agroecological systems that are increasingly efficient, resilient and adapted to local contexts.

Further investment is needed in applied, on-farm, participatory research, including the selection of varieties and species on the farm, as stated above.

The main areas of research requiring further investment to support the development of agroecology, include the following:

» Livestock. Despite the importance of livestock in ensuring nutrient recycling in agroecological systems, scientists have focused more on crops than on the livestock sector. More work needs to be done to support the integration of livestock and fisheries into cropping systems. Although numerous examples of traditional farming systems were presented with a high level of crop/livestock/fish integration, it was also underlined that such systems are under pressure to become more specialized in all regions.

» Ecosystem services and design of agroecological systems. The need to guide the design of innovative farming systems was highlighted as a priority in Asia, where participants in China emphasized the important role and contribution of pollinators, trees, auxiliary organisms and microorganisms for ecosystems, human nutrition, health and well-being (Recommendation 9, Kunming).

- Social sciences. Systems design is intimately linked to the people who shape them in correspondence with their own socio-ecological systems. Extending agroecology research to the social sciences was a recurring issue. The importance of further work in human sciences applied to agroecology was also recalled in Africa and Europe.
- Local area. Research applied to the territory has made it possible to support communities in their integrated approaches and was the subject of several recommendations in China.
- Efficiency. Participants in China stressed the importance of driving innovations in the efficiency gains of systems, referring to the need to close as much as possible ecological cycles in addition to water, nutrient, organic manure and energy cycles, as well as to the need to take into account long-term effects (Recommendation 11, Kunming).
- Nutrient flows. Participants underscored the need to understand the complex problems caused by nutrient flows in food systems (Recommendation 13, Kunming).
- Climate change. The need to identify animal, plant and tree species adapted to climate change was highlighted in Africa (Recommendation 19, Dakar).
- Long-term impact. A new frame of reference and impact measurement is required in order to assess the multifunctionality of agroecology at the environmental, social and economic levels, as well as the expected long-term effects.

All regions, in particular Europe (Recommendation 16, Budapest) emphasized that in addition to research, practices and solutions were urgent to harness the transformative potential of agroecology, enabling adaptation to and mitigation of the effects of climate change.

Strengthening synergies between organic farming and agroecology and their co-evolution was recommended in Europe (Recommendation 33, Budapest), where agroecology is often considered to be a precursor of organic farming and a laboratory for technical or regulatory innovation.

Finally, research centres must mainstream agroecology as a priority in their strategic research.

PROMOTING TECHNICAL, SOCIAL AND INSTITUTIONAL INNOVATIONS FOR AGROECOLOGY

In all regions, the vital role of innovation in the broadest sense was highlighted. Participants stated that producers required not only technical innovations, but also social and institutional, and conceptual and methodological innovations. Similarly, in line with the participatory research approach of agroecology, valuing the ongoing innovation and experimentation process that small-scale producers have undertaken for generations was recalled as essential (Recommendation 18, Kunming).

Participants in Latin America also emphasized the importance of fostering social and technological innovation dynamics in territories through interdisciplinary and intersectoral research (Recommendation 5, Brasilia).

This led to a debate on innovation, with Latin America adamant that social innovations are the catalyst for empowering producers: they allow them to generate their own innovations and hence put in place a sustainable innovation system that boosts food security for small-scale producers.

Europe has traditionally taken a more technical approach to innovation, but the debates during the FAO seminar stressed that innovation should be opened up to all facets, including social and institutional innovations, which are key to boosting the innovation process and to driving future innovations.

The social grassroots innovation of the farmer-to-farmer approach played a key role in strengthening farmers' production and resilience in the context of an international trade embargo; farmers developed the capacity to adapt and find solutions in adverse situations.

In terms of innovation, the FAO seminar participants in Asia, Europe and Latin America underscored the concept of producers' independence or even sovereignty *vis-à-vis* innovations, including technological innovations. Most participants agreed on the importance of technological independence with a focus on innovations that meet producers' real needs and which are easy to adapt to local needs and uses.

The idea of setting up an innovation platform bringing together various actors locally was also proposed, in a similar vein to the creation of a multistakeholder platform.

SETTING UP MULTISTAKEHOLDER COOPERATION PLATFORMS

There are numerous agroecological approaches and their impact is clear at local level. However, it is crucial to share success stories in order to inspire and guide others, not only in the field, but also through public authorities, to show that another way is both possible and effective. The challenge lies in the dissemination of information not only for motivational purposes: information is also needed for awareness raising, training, capitalization and advocacy.

Networks of actors and experience-sharing platforms are emerging in all regions in various formats, and the participants of all seminars unanimously called for such networks to be created on a larger scale, i.e. at national, subregional or regional level, to boost their prominence and effectiveness.

Although some networks may be sectoral, such as researcher networks, there is a trend towards ensuring a global vision and multistakeholder exchanges to foster innovation and co-creation by setting up thematic networks of farmers, researchers and citizens. These networks or platforms can be either physical or virtual. New technologies and in particular mobile exchange applications allow for significantly more direct exchanges between producers and enable horizontal training. They are increasingly used on many projects such as farmer field school (FFS) projects in Senegal, where farmers directly exchange messages and pictures and share their questions and findings.

The need to set up multistakeholder exchange platforms was expressed in all regions. Latin America already has a regional network of scientists and social movements (SOCLA), but it also called for the creation of a platform involving social movements, governments and scientists, to share good practices and to facilitate dialogue between these actors (Recommendation 8, Brasilia).

Africa made the same request with a focus on sharing practices at regional and national level (Recommendation 3, Dakar). Here it is worth noting Senegal's initiatives, such as the TaFAé technical platform (multistakeholder task force for the promotion of agroecology), which allows all actors to discuss the agroecological approach and share good practices. Similarly, a platform under the aegis of the Government is being considered. In its regional priorities for 2018-19, the FAO Regional Office for Africa identified the creation of an agroecology researcher network.

Asia called for national and regional platforms that undertake environmental monitoring and fundraising (Recommendation 5, Bangkok), together with a regional network of researchers involving small-scale producers and civil society to share lessons learned between countries (Recommendation 12, Bangkok). The China seminar stressed the need for a network to share successful case studies of small-scale farmers and traditional and indigenous agriculture (Recommendation 22, Kunming). The Near East focused on taking into account family farms and pastoralists (Recommendation 7, Tunis) and on mapping the knowledge of various stakeholders within the region (Recommendation 11, Tunis). It also proposed a network of countries that have integrated agroecology into their Nationally Determined Contributions (NDCs) as part of the Framework Convention on Climate Change (Recommendation 25, Tunis).

Europe's proposal was to strengthen synergies by linking a number of existing initiatives and platforms, including the European Commission's Innovation Partnership Networks[12] and the FAO Agroecology Knowledge Hub[13] launched on the day of the seminar (Recommendation 27, Budapest).

Another important vector for international innovation creation and sharing is South-South and triangular cooperation. This was highlighted in all regions, and although agroecology is a highly contextualized approach, innovations or success stories in certain regions can be a valuable resource for others, as borne out recently by the joint work between Latin America and Africa on biological control of the fall armyworm.

INVESTING IN CAPACITY DEVELOPMENT, INCLUDING SUPPORT FOR AGROECOLOGY TRAINING INITIATIVES AMONG GRASSROOTS ORGANIZATIONS

The need for capacity development among producers and their organizations to create their own training schools and processes capitalizing on their dynamism, potential for adaptation and innovation was also evident. In all regions, horizontal training systems – such as the farmer field schools (FFS) and farmer-to-farmer networks successfully implemented in Cuba and elsewhere in Latin America – were widely recognized as a very effective means of developing agroecology.

[12] EIP-AGRI https://ec.europa.eu/eip/agriculture/en

[13] www.fao.org/agroecology/en/

Figure 4 Kaydara Farm, Senegal: land tenure certificates delivered to the students

Since agroecology is highly location specific and knowledge intensive, people-to-people learning is key for facilitating the spread of knowledge, including specific tools such as FFS at local levels. FFS approaches were developed and scaled up by FAO in Asia during the late 1980s and early 1990s, and are now unanimously recognized as a powerful extension instrument for fostering agroecological principles as they build farmers' capacities to observe and react to ecological processes. Many organizations have used FFS for engaging a strong scientific and experiential learning process on issues relevant to agroecology, such as organic farming, Integrated Pest Management (IPM), Integrated Soil Management (ISM), Sustainable Rice Intensification (SRI), and more than 1 million farmers were trained through the IPM-FFS programme.

The FFS learning process initially promoted by FAO for extending IPM practices is now adopted by a large range of stakeholders for a variety of topics including agroecology (FAO, 2016b). In Asia – where FFS has reduced the dependence of millions of farmers on pesticides and enabled understanding and rebuilding of ecosystem services – participants recommended strengthening the FFS tool and extending the sectors it addresses to livestock, fish and pastoral ecosystems (Recommendation 11, Bangkok).

The key role of the grassroots social process of farmer-to-farmer exchanges in capacity building was highlighted in Latin America. In Cuba for instance, the National Association of Small Farmers (ANAP) successfully adopted farmer-to-farmer exchange to survive the crisis caused by the United States trade embargo. Cuban farmers were able to boost food production without scarce and expensive imported agricultural chemicals: first, they introduced more ecological inputs when substituting imports that were no longer available, and they then made a transition to more agroecologically integrated and diverse farming systems. The spread of agroecology was rapid and successful, largely due to the social process methodology and social movement dynamics. Farmers made an increased contribution to national food production in Cuba and resulting benefits included resilience to climate change (Rosset *et al.*, 2011).

All regions cited the need to include agroecology in formal and informal study programmes in producer training centres. The Kaydara farm approach presented at the Africa seminar showed how a training centre could boost a territory and keep young people in rural areas. The centre works closely with villages and municipalities and not only trains local youth but also helps them to settle there by negotiating long-term tenure at the end of the training course. There is a social impact on the area, as young people return and once again view farming as an attractive profession, but also an environmental impact, as soil quality and the environment improve thanks to agroecological practices that integrate crops, trees and animals.

In Asia, participants called for the establishment of specific agroecology national training centres for the implementation of strategic crosscutting education programmes on agroecology (Recommendation 6, Bangkok). They emphasized the importance of interactions between consumers and farmers and of the use of new technologies and social networks to this effect.

In the Near East, participants suggested launching pilot sites in all major ecosystems in the region to show that agroecology works and to demonstrate how modern and traditional knowledge could be combined to address challenges (Recommendation 3, Tunis).

In addition, training agricultural managers was flagged as a priority. For this reason, and to increase consumer awareness, it was recommended to include agroecology in study programmes in primary, secondary and higher education. It was recommended to consult small-scale producers when devising these programmes.

PROMOTING MARKETS FOR AGROECOLOGY-BASED PRODUCTS AND SERVICES

Fostering experience and knowledge sharing, research and innovation is one of the four priority areas that emerged from participants' discussions and recommendations. Four areas of action are described below:

- → Supporting short food supply chains and innovative markets such as public procurement schemes
- → Raising consumer awareness on the benefits of agroecological products, including nutritional quality and health
- → Developing solidarity-based economies and private sector engagement
- → Promoting territorial approaches and the transition to circular food systems.

SUPPORTING SHORT FOOD SUPPLY CHAINS AND INNOVATIVE MARKETS SUCH AS PUBLIC PROCUREMENT SCHEMES

Food distribution, sales, marketing and market supply chain relationships are major drivers of farmers' decisions and actions. Short value chains and innovative markets were identified as market factors that facilitate the broader adoption of agroecological practices. Bringing together farmers and consumers is a key step in building more sustainable food systems. Improved understanding and increased knowledge of mutual expectations enables this connection and often results in more virtuous practices for the environment and in solidarity between consumers and farmers. In addition, it enables sales in local communities, with a positive impact on social cohesion, the economic vitality of territories, and the carbon footprint of systems.

Direct sales and direct producer–consumer contacts are becoming more popular across countries. In all regions, participants recommended supporting short food supply chains through public policies facilitating physical infrastructures designed to promote local sales (markets, fairs, festivals) or through public procurement of agroecological products, considered one of the most promising models for promoting local production and consumption.

The importance of backing community-supported agriculture (CSA) networks was recalled, particularly in Europe and China where they are increasing significantly. Given the growing demand worldwide for safe and healthy food and the existence of local food systems, there are increasing opportunities to strengthen markets for agroecology. In China, an estimated 300 000 consumers are members of CSA groups and since 2010 there has been an annual national CSA conference. Recognition in public policies of equitable markets and emerging networks was called for by participants in China (Recommendation 26, Kunming). To further strengthen

such markets, participants in the regional meeting for Europe and Central Asia agreed on the importance of providing financial and infrastructure support for local food processing units and of developing sanitary rules adapted to local conditions for farmers' markets.

Experiences from public procurement programmes in Latin American and the Caribbean are being tested in Africa as part of South–South cooperation initiatives and the initial results are encouraging. Europe emphasized the virtues of this means of supply, which leads to fresh, affordable and nutritious products that contribute to building or rebuilding local and regional economies (Recommendation 13, Budapest).

On this note, participants in China stressed the importance of adapting procurement standards and protocols to local agroecological production, in particular considering more informal trade relations (Recommendation 28, Kunming).

Similarly, support for infrastructure for local collective product processing and support for food safety and quality rules adapted to local markets was considered to be essential in Africa and Europe (Recommendation 14, Budapest).

In Africa, increasing the added value of products through agroecological innovations was seen as a major lever for attracting and remunerating young people and empowering women (Recommendation 23, Dakar).

All regions agreed that it was a priority to support small-scale producers and family farms through investment in market access; a recommendation to this effect wasexplicitly made in Asia (Recommendation 4, Bangkok).

With regard to market access support for small-scale producers, participants recalled national implementation of the Committee on World Food Security recommendations to connect small-scale producers to markets (FAO, 2016a). This applies to all regions and is a pillar for solving poverty issues and bringing added value to local production (Recommendation 15, Budapest).

Participatory guarantee systems (PGS) were reported in many countries, with more sustained development in Latin America and Asia. While most national organic labelling schemes require certification by a third party, PGS enable local sales of non-certified products by adopting a process of farmer and community peer review. These locally controlled guarantee systems keep the costs of certification down for producers and enable a constructive exchange and creation of local markets for consumers and members of the community. All regions urged that PGS be recognized as valid forms of certification at national level. To strengthen these systems, the participants of the seminar in Latin America proposed creating PGS reciprocity mechanisms in the region (Recommendation 9, Brasilia).

RAISING CONSUMER AWARENESS OF THE BENEFITS OF AGROECOLOGICAL PRODUCTS, INCLUDING NUTRITIONAL QUALITY AND HEALTH

Nutrition is gaining attention in the agroecology community. The simplification of diets contributes to increased micronutrient deficiencies; in contrast, biodiversity in production systems leads to diverse diets and greater micronutrient intake. Agroecology brings nutritional benefits, as micronutrient intake increases with the integration of biodiversity in production systems and the provision of nutrient-rich wild foods growing on agroecological landscapes. In addition, initiatives to revive traditional foods often serve to promote agroecological approaches. Traditional foods are prepared using local biodiversity and require food preparation techniques that are beneficial to health, such as fermentation. The Korean Indigenous Seeds Preservation Movement, for instance, aims to protect traditional varieties through educational activities on traditional food processing, cooking and diets. More evidence is needed on the impact of direct exchanges between farmers and consumers and short value chains on consumers' eating habits and diets.

Education and awareness raising of consumers to promote the transition to a new food model are essential and were stressed in recommendations in three regions: responsible consumption in Latin America (Recommendation 11, Brasilia), health benefits in the Near East (Recommendation 6, Tunis), and nutritional quality in Africa (Recommendation 11, Dakar).

Likewise, educating children about the importance of healthy and local food and the issues surrounding agroecological production from an early age was deemed to be vital. It is vital to raise awareness while tomorrow's decision makers are still developing their civic consciousness, because an increasing number of and more youth now live in cities or are disconnected from agriculture.

DEVELOPING SOLIDARITY-BASED ECONOMIES AND PRIVATE SECTOR ENGAGEMENT

Engaging all actors, especially economic actors, is essential to complete the transition. Agroecological products are not only consumed by the producers who cultivate them, but are also traded and consumed by non-growers. The transfer of agroecological products from producer to consumer involves a host of economic actors: input suppliers, traders, wholesalers, processors, retailers, caterers and chefs, distributors, financers, shippers etc. To make the transition towards agroecological food systems, participants recommended rethinking the role of the private sector, with a focus on reciprocity, equity and inclusivity. By highlighting solidarity between members of the food system, consumers, producers and intermediaries can receive fair prices and additional value from the trade of agroecological products.

Setting up cooperatives (both producer and consumer) based on equity sharing and fairness can facilitate sustainability when it comes to the nature of products, payments made to producers, and the access they provide to more distant markets. Indeed, market access is a major obstacle preventing producers from overcoming poverty. Institutional innovations exist around the world to facilitate market access from various angles, including logistics, access to pricing information and organization of supply, training on opportunities, and training local actors as reliable and transparent intermediaries.

Two proposals were made in Africa: one to encourage the private sector to embrace the principles of agroecology (Recommendation 13, Dakar) and another to create a solidarity economy development network that supports agroecology (Recommendation 20, Dakar).

PROMOTING TERRITORIAL APPROACHES AND THE TRANSITION TO CIRCULAR FOOD SYSTEMS

Developing territorial approaches, in line with the need for an integrated approach in agroecology, is a priority in all regions. The territorial approach supplies a common natural and cultural heritage, provides coherence in creating and managing agroecosystems and food systems, fosters synergies in training, supply and marketing actions, and finally, creates social linkages, making it a pillar for the development of agroecology. It also contributes to decompartmentalizing sectors, fostering a global approach to situations and management of agreements. Governance on a smaller scale also has the advantage of proximity to the decision-making level, which facilitates responsiveness.

In Africa, it was recommended to set up territorial projects with a proposed focus on the notion of the *terroir*: a geographically bound space that has a unique ecosystem and cultural traditions (Recommendation 5, Dakar). The idea of agroecological *terroir* is supported by farmers' organizations: the Earth and Peace project run by the NGO Cospe and funded by the European Union enabled 60 young people to settle in six rural community sites in Casamance (Senegal), Tahoua (Niger) and Nioro Sahel (Mali). In addition, with permission from local administrative and traditional authorities, more than 40 ha of agricultural land were allocated to carry out individual and collective agroecological projects.

Several territorial projects were presented in Asia, for example, agroecological villages in Bangladesh. Participants called for pilot projects, such as collective territorial projects, to cover all community, social, economic, environmental and cultural dimensions (Recommendation 8, Bangkok).

The importance of the territorial approach coupled with decentralization was emphasized in the Near East (Recommendation 19, Tunis).

In Europe, it was proposed that local food policy councils at local and national level be set up to engage consumers and producers in decision-making processes around food systems, markets and trade (Recommendation 3, Budapest).

This demand for reinforced territorial governance is increasingly reflected in a more organized or institutional fashion by upstream strategic analysis and the implementation of territorial projects whose food component is often a point of entry extended to all economic, energy and social activities in the territory via circular economies. Initiatives such as bio-district in Italy, villages in transition in Burkina Faso, and local food systems in France are relevant examples.

REVIEWING INSTITUTIONAL POLICY, LEGAL AND FINANCIAL FRAMEWORKS TO PROMOTE AGROECOLOGICAL TRANSITIONS FOR SUSTAINABLE FOOD SYSTEMS

Analysing the success of the many initiatives presented sheds a light on their innovative nature and the way in which the actors were able to seize existing opportunities and develop them further. However, it was unanimously noted that many barriers stand in the way of project leaders taking an alternative approach to a dominant system. Participants' requests concerned two aspects: a framework to facilitate farmers' actions, and financial support for organizations and producers. The following actions were set out in the recommendations:

→ Developing public policies and initiatives with appropriate funding to foster agroecological transitions

→ Considering the specific needs of family farmers, including women and youth, by including them in policy development

→ Implementing integrated food policies and guidelines with greater coherence across sectors and long-term thinking

→ Considering the externalities of agriculture and drawing up multicriteria indicators to measure the long-term performance of agroecological systems.

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DEVELOPING PUBLIC POLICIES AND INITIATIVES WITH APPROPRIATE FUNDING TO FOSTER AGROECOLOGICAL TRANSITIONS

Public policies have been widely criticised because they do not support and may even actually hinder small-scale producers by discouraging on-farm diversification initiatives and failing to facilitate comprehensive, long-term and integrated approaches such as agroecology. This results in increased costs and risk-taking by farmers, who are decisive for the commons and general good (for example through the ecosystem services that they provide free of charge).

All regions mentioned the need to include agroecology in national and subregional policies and programmes, such as the Comprehensive African Agriculture Development Programme (CAADP), European Common Agricultural Policy (CAP) and the Community of Latin American and Caribbean States (CELAC), and the importance of factoring in all sectors, including fisheries, forests and animal husbandry.

In Latin America, following the second regional seminar in La Paz, participants presented a Regional Work Agenda with four pillars to implement the recommendations (Annex II):

- Governance for the construction and implementation of public policies on agroecology.
- Information generation, knowledge management and capacity development on agroecology.
- Promotion of markets that stimulate and favour agroecological production and consumption.
- Rescue and recognition of the value of agrifood systems with territorial identity.

The participation of farmers, especially small-scale farmers, in drawing up public policies is key to ensuring that policies are adapted to their needs and diversity. Latin America emphasized the need for social movements to participate in the definition, implementation and monitoring of public policies for agroecology (Recommendation 1, Brasilia).

With regard to support for farmers, financial aid for the transition to agroecology is essential to initiate the transition process on a larger scale. Specific funding must be earmarked for the implementation of public policies and programmes for two reasons: to support farmers and to send out a positive signal. To this end, a proposal was specifically made in Africa for a regional agroecology fund to enable donors to support any efforts made at government level (Recommendation 8, Dakar).

Support for the transition of practices towards diversification, using local seeds and animal feed to restore productive ecosystems, limit nutrient waste and thereby boost productivity and resilience, reducing inputs such as fertilizers and synthetic pesticides, imported industrially processed feed, medication and fossil fuels, was highlighted through the implementation of related policies.

The promotion of decentralized interventions on food systems with territorial and collective action is also a priority. All regions are keen to see support for territorial, local and decentralized policies. Support may be in the form of farmers' organization initiatives and local agroecology schools and training centres, which play a key role in capacity building for an agroecological transition. In line with the above-mentioned role of agroecological research, strengthening support for public research was flagged as paramount and classed as a priority in all regions to uphold the potential of research and innovation and to ensure that research is geared towards the public good and general interest.

The integration of agroecology in FAO's Regional Initiatives was proposed during the FAO seminars. The Regional Initiatives[14] contribute to achieving FAO's major strategic objectives of eliminating hunger, improving the sustainability of agricultural, food and forest systems, reducing poverty, building more efficient agricultural and food systems, and improving the resilience of livelihoods.

The role of international organizations and South–South cooperation were are also presented as important aspects to foster transition, as mentioned earlier regarding the need for multistakeholder platforms at all levels to stimulate innovation.

In Latin America, participants proposed celebrating an International Year of Agroecology (Recommendation 16, La Paz).

As a crosscutting approach, agroecology contributes to the attainment of all strategic objectives and is an effective tool for implementing FAO's Regional Initiatives, particularly when it comes to the three initiatives to combat hunger in Africa, Asia and the Pacific, and Latin America, in addition to supporting family farming and smallholders under the three related initiatives in the Near East and North Africa, Latin America and the Caribbean, and Europe and Central Asia.

Similarly, agroecology can provide key support to strengthen farmers' resilience, especially to climate change, in the related FAO Regional Initiatives in Africa, the Near East and North Africa, Latin America and the Caribbean (and soon in Asia and the Pacific).

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[14] www.fao.org/about/what-we-do/en

CONSIDERING THE SPECIFIC NEEDS OF FAMILY FARMERS, INCLUDING WOMEN AND YOUTH, BY INCLUDING THEM IN POLICY DEVELOPMENT

The need to give priority support to small-scale producers and family farms was underscored in all regions, while also recalling the importance of encouraging other types of farm, since a successful transition requires the contribution of all. In Asia, specific emphasis was placed on the importance of prioritizing farmers in resource-poor or degraded areas (Recommendation 2, Bangkok).

In Latin America, participants recommended including agroecology as a permanent topic in the agenda of the Family Farming Ad Hoc Working Group of CELAC (Recommendation 10, Brasilia) and recommended the creation of a specific working group focused on agroecology in the Specialized Meeting on Family Farming of MERCOSUR (REAF) (Recommendation 12, Brasilia).

Support for family farms is essential, because they account for the lion's share of basic food production (cereals, such as rice, millet and sorghum, and tubers and plantains. With a workforce of around 500 million holdings, this type of farm creates most jobs and has absorbed the majority of the 350 million new agricultural workers in the last 30 years (Bélières, 2015).

Agricultural and agroecological policies geared towards family farming will facilitate coherence with the start of the International Decade of Family Farming. The Decade is part of a positive and dynamic initiative aimed at highlighting family farming challenges and their real and potential contribution to global food production, tackling poverty and achieving the Sustainable Development Goals.

In Latin America, participants emphasized the need for a public policy aimed specifically at women to enable them to overcome the barriers they face as a result of their workload and their historical role in agroecology (Recommendation 6, Brasilia). Participants from all regions agreed on this during the debates.

IMPLEMENTING INTEGRATED FOOD POLICIES AND GUIDELINES WITH GREATER COHERENCE AND LONG-TERM THINKING

It was requested that agroecology be considered comprehensively, taking into account its multiple dimensions from production to food, particularly in Europe, where there is a call for integrated food policies promoting dialogue and health, nutrition, ecology, trade and agriculture (Recommendation 10, Budapest).

The coherence of public policies was at the heart of the debate. Furthermore, the issues of aid, regulatory mechanisms, taxes and trade agreements, which hamper the transition to agroecology, were raised in all regions, resulting in participants suggesting a review of the policies in question to improve the effectiveness of public action in supporting agroecology.

In Africa and Asia, subsidy policies that encourage procurement of industrial inputs to the detriment of more expensive and more virtuous organic inputs, repeatedly emerged as an issue. Similarly, the paradox of trade policies that lead to imports of products that compete with local

products and weaken the country's producers – who are the backbone of its food security – was criticized. Not only do such policies fail to encourage these initiatives, they actually hinder them.

The participants in the Near East and North Africa suggested setting up an interministerial committee to develop agroecology (Recommendation 20, Tunis).

Beyond the coherence of public policies lies the question of redirecting aid to encourage virtuous practices and to deter practices that have an adverse effect on public goods.

Similarly, it was stressed that public policies should take into account the long-term effects on agriculture when measuring policy impact. Although impacts on climate change or the provision of ecosystem services are difficult to quantify, they must guide public policymaking. The role of research in identifying, quantifying and qualifying possible levers was highlighted in Europe (Recommendation 8, Budapest).

CONSIDERING THE EXTERNALITIES OF AGRICULTURE AND DRAWING UP MULTICRITERIA INDICATORS TO MEASURE THE LONG-TERM PERFORMANCE OF AGROECOLOGICAL SYSTEMS

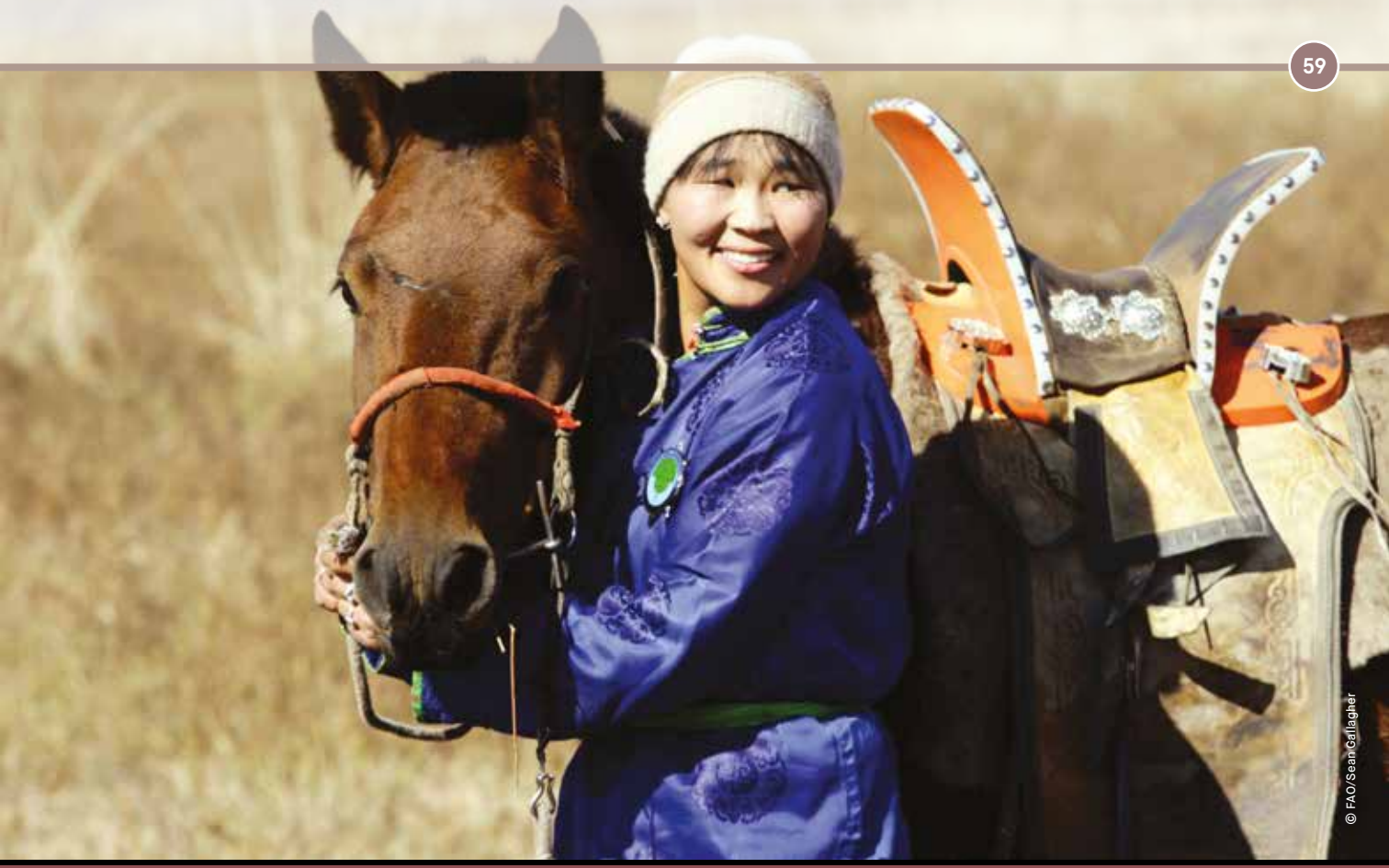
Governments may be motivated to redirect aid policies and programmes towards agroecological approaches for social and environmental factors, but it is also important that their decisions are evidence-based. Cost internalization calculations of intensive agriculture allow us to highlight the direct interest that public authorities may have in subsidizing approaches in order to avoid water pollution, loss of biodiversity, soil degradation, health problems, employment in rural areas and so forth. Procedures for calculating externalities are under development and more evidence is needed to best guide public policies.

The key to highlighting the comparative advantages of agroecology and facilitating policies that encourage the development of systems with an impact on public goods lies in changing the way in which we measure agricultural performance.

Performance is multifaceted; however, traditional indicators do not account for externalities, and furthermore they fail to measure certain aspects that are essential in the contribution of agricultural models to the Sustainable Development Goals at environmental, economic and social level. It was recommended to move beyond the measurement of immediate performance and to incorporate the long-term effects and virtuous circles generated by agroecology.

Designing an indicator grid emerged as a priority, as did the gathering of data to reflect the range of agroecological amenities at economic, social and environmental level, including the effects on different spatial scales (farm, territory, state) and times (especially the long term). While research is paramount, civil society participation in this process was also recommended. FAO has begun technical and statistical work as part of the next biennium.

Some of the benefits of agroecology that could be further analysed to inform policymaking for the long term are issues related to restoring ecosystem services, generating employment and delivering healthy and sustainable products.



SECTION 4

MOVING FORWARD: SCALING UP AGROECOLOGY

> DEVELOPMENTS AT REGIONAL AND INTERNATIONAL LEVEL FOLLOWING THE FAO SEMINARS

> SUSTAINABLE FOOD AND AGRICULTURE IN FAO

> AGROECOLOGY AND THE SDGs

> TOWARDS THE SCALING UP AGROECOLOGY INITIATIVE

DEVELOPMENTS AT REGIONAL AND INTERNATIONAL LEVEL FOLLOWING THE FAO SEMINARS

In Africa, following the agroecology seminar organized by FAO and the Government of Senegal in November 2015 in Dakar, the Ministry of Agriculture and Enda PRONAT co-organized a sub-regional workshop on agroecology and food security in November 2016, which resulted in the implementation of the FAO seminar recommendations in Senegal. A second workshop was held in February 2018 and lauched the national agroecology platform in Senegal, coinciding with an evening schedule of television programmes on agroecology to raise awareness among the population at large.

In parallel, in December 2015 a multistakeholder task force for the promotion of agroecology in Senegal (TaFAé) was set up, bringing together more than 80 actors from various disciplines and backgrounds involved in agroecology in Senegal (researchers, NGOs, farmers' organizations, outreach services, decision makers, donors). This task force allows all stakeholders to share their experiences in order to mutually develop their capacities on action research themes and to provide solutions to the needs expressed by family farms. With the support of the National Research Institute for Sustainable Development (IRD), the European Union and FAO, in December 2016 TaFAé organized multistakeholder days for the development of agroecology, with the participation of more than 200 actors from various fields in several West African countries (Senegal, Burkina Faso, Mali, Niger).[15] The mobilization of more than 100 young people, who presented a declaration and see agroecology as a way to respond to the issue of employment in rural areas, was a particularly remarkable result in terms of the youth employment challenges facing the continent. Agroecology trainings were supported by FAO in Mali, Burkina Faso and Mozambique and national platforms for agroecology were set up in Mali, Senegal and Burkina Faso.

In Latin America, two FAO seminars on agroecology were held. At the second FAO seminar in the Plurinational State of Bolivia in 2016, in addition to new recommendations for the development of agroecology, a regional agenda was defined to strengthen and develop agroecology sustainably. There is already considerable momentum in agroecology in this region, and the seminar shone light on this mobilization. In November 2016, the Ministerial Declaration of CELAC on Family Farming and Rural Development ratified its Members' commitment to support the implementation of the regional agroecology agenda proposed at the FAO seminar in La Paz, the Plurinational State of Bolivia, in September 2016. Thus, the thirty-fourth FAO Regional Conference (Mexico, 2016) recognized the importance of agricultural policies that focus on territories and agroecology, considering agroecology as fundamental for human rights and the transformation of the rural sector in Latin America, and sustainable use of natural resources, risk management and adaptation to climate change (FAO, 2016c).

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[15] **Plateforme des ONG eurpéennes au Sénégal.** 2016. *Rencontres et visites de la TaFAé* [online]. Dakar. [Cited 22 March 2018]. https://pfongue.org/-Rencontres-et-visites-de-la-TaFAe-.html

In September 2017, a Meeting of Consumer Organizations for the Promotion of Adequate Food in Latin American and Caribbean was held in El Salvador, gathering participants from 12 countries. One of the recommendations of the meeting recognized the role of agroecology to promote changes in food systems and requested governments to support agroecology to fight malnutrition in all its dimensions.[16] ("Establish policies and legal frameworks to promote the production of agroecological foods, biodiversity and intensifying the use of native seeds, promoting good agricultural and marketing practices, establishing healthy food collection centres, to facilitate access to nutritionally adequate and safe foods.")

Since 2015, FAO and partners have been implementing a Regional Agroecology Agenda[17] in line with the regional priorities[18] through four pillars of action: i) governance and policies; ii) information, knowledge and capacity building; iii) agroecological markets; and iv) valuing local agriculture and food systems. In this context, with a view to accelerating rural development and territorial revitalization, stimulating sustainable and resilient agriculture and food systems, and scaling up this agenda, FAO is promoting agroecology as a territorial development approach in selected areas identified under the '100 Latin America and the Caribbean territories strategy' in the framework of the FNS-CELAC Plan. This strategy is geared towards the poorest and most vulnerable territories in the region in terms of hunger, which are being left behind with regard to achievement of the SDGs. In Latin America and the Caribbean, FAO is making progress in implementing agroecology in some territories, supporting countries with policy development, agricultural production and trade, capacity building and extension practices, and on building strategic partnerships with governments, academia, the private sector and civil society to ensure the SDG principle of 'no one left behind'. The main outcome of this work is building a strong evidence base and lessons learned for scaling up agroecology in the region.

In Asia, the FAO regional seminar was followed by an international seminar in China organized with the Chinese Academy of Agricultural Sciences (CAAS), where the many dimensions of the country's very rapid shift towards ecological agriculture were explained, as it seeks to build an ecological civilization. At the request of FAO Members, the 17 recommendations for the development of agroecology in Asia and the Pacific from the FAO Regional Seminar on Agroecology were presented in an Information Note[19] to the Thirty-third Session of the FAO Regional Conference for Asia and the Pacific (7-11 March 2016), which took note of these

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[16] www.andcu.org/wp-content/uploads/2017/09/Posicionamiento-de-organizaciones-de-consumidores.pdf

[17] The Regional Agroecology Agenda is outcome of the work of FAO together with governments, civil society, private sector and academy. The Ministerial Declaration of the Community of Latin American and Caribbean States (CELAC) on Family Farming and Rural Development (El Salvador, 2016) and the 34th FAO Regional Conference (Mexico, 2016) recognized this agenda. Among the main initiatives carried out within the framework of this agenda are: i) the first seminar on Agroecology held in Brazil in 2015; ii) the second seminar in the Plurinational State of Bolivia in 2016; and iii) documentation of hard evidence of benefits of agroecology as input for designing and implementing coordinated, decentralized and differentiated public policies within the rural context. The outcomes of the two regional seminars are available at www.fao.org/3/a-au442e.pdf (Brazil, 2015) and www.fao.org/3/a-bq756s.pdf (Bolivia, 2016). The documentation of case studies will be available at the Agroecology knowledge hub at www.fao.org/agroecology/database/en.

[18] The Regional Agenda of Agroecology is an important pillar for regional priority two: family farming and inclusive food systems for sustainable rural development. More information on the regional priorities is available at www.fao.org/americas/prioridades/agricultura-familiar/en.

[19] Information note on Agroecology presented to the 33rd Session of the FAO Regional Conference for Asia and the Pacific: www.fao.org/3/a-mp727e.pdf

recommendations and "highlighted the multi-stakeholder dialogues on the potential roles of agroecology [...] in productive, sustainable and inclusive food systems". In India, the government of Andhra Pradesh (GoAP) is engaged in a huge scaling up of an agroecology programme called Zero Budget Natural Farming (ZBNF), which will target 500 000 farmers in 2018-19.

In Europe, the Hungarian government presented the recommendations arising from the FAO Regional Seminar for Europe and Central Asia to the Council of European Ministers on 12 and 13 December 2016 as part of the work on the forthcoming Common Agricultural Policy. A debate on agroecology was held by the European Parliament in February 2018. An international seminar organized by Agroecology Europe[20] was held in October 2017 in Lyon which brought together over 400 participants to examine institutionalization methods in agroecology and to highlight innovations.

In the Near East and North Africa, FAO Members will discuss guidance on the role of agroecology in tackling climate change ('Agroecology: Adapting to Climate Change in Semi-arid Areas for Sustainable Agricultural Development') from 23 to 27 April 2018 in Lebanon at the FAO Regional Conference to set priorities for FAO support to its Members in the coming two years.

The United Nations General Assembly in New York in its December 2017 report on agricultural technologies and sustainable development (72nd session-17-20231 (E) 161117) recognized the importance of improving the links between agricultural technologies and agroecological principles to put in place more sustainable and innovative food systems.

The UN Framework Convention on Climate Change (UNFCC): At the Twenty-third Session of the Conference of the Parties (COP 23), UNFCC parties agreed to address agriculture in the negotiation process. FAO's global assessment of the Nationally Determined Contributions (NDCs) shows that countries expect agroecology to play a significant role in responding to climate change. Fifteen countries have explicitly mentioned agroecology in their NDCs. Many other countries committed to addressing climate change issues from an agroecological perspective (ecological farming and ecosystem-based adaptation, among others).

Agroecology's contribution to climate action (SDG 13) is gaining momentum. This approach was referred to during the Conference of the Parties as a promising pathway to fulfilling the Paris Agreement. At COP 24 in Bonn on 16 November 2017, FAO and the International Food Policy Research Institute (IFPRI), in conjunction with the governments of Hungary and France, organized a high-level panel to examine how agroecology helps achieve climate commitments[21] with the participation of ministers of agriculture and the environment from five countries (Poland, Burkina Faso, Tunisia, Hungary and France).

Convention on Biological Diversity: Agroecological systems are mentioned in the Cancun Declaration on Mainstreaming the Conservation and Sustainable Use of Biodiversity for Well-Being: 'The use of measures and incentives to promote diversified agroecological systems and the designation of agricultural biodiversity conservation sites, such as the Globally Important Agricultural Heritage Systems of the Food and Agriculture Organization of the United Nations'.

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[20] www.agroecology-europe.org

[21] www.fao.org/climate-change/news/detail/en/c/1068404

The UN Committee on World Food Security – the foremost inclusive international and intergovernmental platform for food security and nutrition – will adopt policy recommendations on agroecological approaches and other innovations for sustainable agriculture and food systems that enhance food security and nutrition (planned for October 2019).

SUSTAINABLE FOOD AND AGRICULTURE IN FAO

At the Fortieth Session of the FAO Conference, member countries requested the inclusion of agroecology in the FAO's Medium-Term Plan and Programme of Work and Budget for 2018-2019, thereby pushing forward FAO's standard-setting and scientific work on agroecology as part of Strategic Objective 2 (Make agriculture, forestry and fisheries more productive and sustainable) and Strategic Objective 3 (Reduce rural poverty).

SUSTAINABLE FOOD AND AGRICULTURE PRINCIPLES

Under this strategic objective, FAO has developed a common vision for sustainable food and agriculture. It is a vision of a world in which food is nutritious and accessible for everyone and natural resources are managed in a way that maintain ecosystem functions to support current as well as future human needs. In this vision, farmers, pastoralists, fisherfolk, foresters and other rural dwellers have the opportunity to actively participate in and benefit from economic development, have decent employment conditions and work in a fair price environment. Rural men, women, and communities live in security, and have control over their livelihoods and equitable access to resources, which they use efficiently.

Box 11 **SFA principles**

1. Improving efficiency in the use of resources
2. Conserving, protecting and enhancing natural ecosystems
3. Protecting and improving rural livelihoods, equity and social well-being
4. Enhancing the resilience of people, communities and ecosystems
5. Promoting responsible and effective governance mechanisms across natural and human systems

Working with countries to develop and apply these principles across food and agricultural production systems, FAO foresees national, regional and global systems that are socially, economically and environmentally sustainable. This unified perspective – valid across all agricultural sectors and taking into account social, economic and environmental considerations

– ensures the effectiveness of action on the ground and is underpinned by knowledge based on the best available science, and adaptation at community and country levels to ensure local relevance and applicability.

THE 10 ELEMENTS OF AGROECOLOGY

Through the regional seminars organized by FAO, 10 Elements (see Figure 5 below) emanated as essential components of agroecology. They apply at local, national, regional and global level. They guide transition processes and are a pathway to achieve FAO's common vision on sustainable food systems.

Figure 5 The 10 Elements of agroecology

The 10 Elements consider major environmental, social and economic characteristics, processes and enabling-environment factors – and their interactions – typical of diversified agricultural systems that are guided by agroecological principles and practices. They also recognize the great potential of collective action processes to foster knowledge sharing, and to deepen understanding, enabling behavioural changes in food systems that are required for sustainable agriculture to become a reality.

FAO INSTRUMENTS AND ACTIVITIES AND EXPERIENCES THAT ARE RELEVANT FOR SCALING UP AGROECOLOGY

FAO as both a normative and operational body offers a broad range of activities, instruments and experiences that are relevant for scaling up agroecology. The Organization's normative resources are continuously fed back into its work, ensuring the quality of FAO's activities in the field. Likewise, FAO's normative work is constantly reinforced by lessons learned in the field. Indeed, it is this combination of normative and operational activities that explains the unique value added that FAO is able to provide to its Members.

FAO Governing and Statutory Bodies have adopted a number of normative instruments that are relevant to Agroecology (see Table 2).

Table 2 FAO normative instruments relevant for agroecology

Committee on World Food Security	1. Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security 2. Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security 3. The principles for responsible investment in agriculture and food systems
Commission on Genetic Resources for Food and Agriculture	1. The Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture 2. The Global Plan of Action for Forest Genetic Resources 3. The Global Plan of Action for Animal Genetic Resources 4. Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action on Nutrition
Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture	1. International Treaty on Plant Genetic Resources for Food and Agriculture
Committee on Fisheries	1. Code of Conduct for Responsible Fisheries 2. Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries
Global Soil Partnership	1. Voluntary Guidelines for Sustainable Soil Management

These and other normative guidelines are translated into concrete activities and guidance at the national level under the five FAO Strategic Objectives:

1. Help eliminate hunger, food insecurity and malnutrition.
2. Make agriculture, forestry and fisheries more productive and sustainable.
3. Reduce rural poverty.
4. Enable inclusive and efficient agricultural and food systems.
5. Increase the resilience of livelihoods to threats and crises.

Within the frame of these Strategic Objectives, FAO has a number of activities and areas of work that are very relevant to agroecology. These challenges are addressed by FAO through Regional Initiatives that are supported by the FAO Regional Offices such as Africa's Commitment to End Hunger by 2025, the Zero Hunger Challenge in Asia and the Pacific or the Hunger-Free Latin America and Caribbean Initiative for the achievement of SDGs 1, 2 and 3.

A new FAO global knowledge product to build evidence on agroecology to support evidence-based decision making will be developed in collaboration with regional and/or global institutions. It will generate data on the impact of the adoption of agroecology on the incomes and livelihoods of small-scale producers, and socioeconomic analysis of the large-scale adoption of agroecology. This analytical approach will enable FAO to provide the best guidance to Members to implement public agricultural and food policies that address the key objectives of sustainable development, among which eradicating hunger and poverty is foremost. A new frame of reference for innovative monitoring and evaluation (outputs, results and impacts) which reflects the multidimensional approach of agroecology could be implemented in this context. The indicators will therefore cover the social, economic and environmental dimensions and will be able to benefit from and contribute to the work that FAO undertakes in this area.

Examples of activities or areas of work contributing to agroecology (non-exhaustive list).

- FAO has been incubating, nurturing and promoting Integrated Pest Management (IPM) and farmer field schools (FFS) for over a quarter of a century. The FFS is a participatory methodology originally developed by FAO in Asia to introduce rice farmers to the benefits of integrated pest management. Its use has been broadened to include a wide range of farming-related topics and the approach has spread through Asia, Africa, Central and South America, and the Near East. There are now over 12 million FFS smallholder family farmer graduates. However, the driver of results is not the number of attendees but rather the empowering quality of the process and how it enables participants to continue to grow, using their new skills and knowledge
- FAO is working with Members and partners in the design and implementation of gender-equitable laws, policies and programmes. Priority policy actions include: increasing women's access to and control over land and other productive resources, decent jobs, market opportunities, social protection and rural services; investing in labour-saving, productivity-enhancing technologies; and strengthening women's leadership and voice in their households and communities, as well as in policy processes.
- The Forest and Farm Facility (FFF) is a partnership launched in September 2012 between FAO, IIED and IUCN, and AgriCord. The FFF funds partnership agreements and small grants with smallholders, women, communities and indigenous peoples' producer organizations and governments at local, national, regional and international levels. Its mission is to promote sustainable forest and farm management by supporting local, national, regional and international organizations and platforms for effective engagement in policies and investments that meet the needs of local people.
- The Global Soil Partnership was established in December 2012 as a mechanism to develop a strong interactive partnership and enhanced collaboration and synergy of efforts between all

stakeholders. From land users through to policy makers, one of the key objectives of the GSP is to improve the governance and promote sustainable management of soils.

- International Initiative for the Conservation and Sustainable Use of Pollinators. FAO has been working with the Convention on Biological Diversity (CBD) since 2009 on the initiative and has focused on raising awareness of the importance on pollinators for food and agriculture, has produced guidance and documents to assist countries on data collection and data analyses in order to identify potential threats on pollinators.
- The Ecosystem Approach to Fisheries (EAF) is becoming the main reference framework for managing fisheries and implementing the principles of sustainable development. The principles that underpin EAF clearly emerged in the 1995 Code of Conduct for Responsible Fisheries (CCRF). Most of the work of the FAO Fisheries and Aquaculture Department is dedicated to promoting and monitoring responsible fisheries, development and management, consistent with the CCRF. The FAO Technical Guidelines for Responsible Fisheries directly address the issue of EAF implementation by providing guidance on how to translate the economic, social and ecological policy goals and aspirations of sustainable development of EAF into operational objectives, indicators and performance measures.
- Based on the positive example of the EAF, the Ecosystem Approach to Aquaculture (EAA) is a strategy for the integration of the activity within the wider ecosystem such that it promotes sustainable development, equity, and resilience of interlinked social ecological systems.
- FAO promotes policies and practices to improve nutrition through agriculture and food systems. It has developed tools to assess the contribution of biodiversity to nutrition, as well as policy guidelines to promote the integration of biodiversity in national nutrition policies and plans. It is also promoting the integration of sustainability considerations in dietary advice through National Food Based Dietary Guidelines.
- Strengthening markets for sustainable markets and for the benefit of smallholders is achieved through several areas of work. The Purchase from Africans for Africa programme (PAA Africa) helps promote local agricultural production while also improving livelihoods and nutrition. In Latin America FAO works in several countries to implement a model for public procurement within rural family farming for school feeding programmes. FAO also provides technical guidance on Geographical Indications, supports training sessions on Participatory Guarantee Systems and has led research on innovative markets for sustainable agriculture.
- The FAO Organic Agriculture Programme was launched in 1999. It has produced a range of normative work on organic agriculture. This includes guidelines for the establishment of appropriate legal and policy frameworks on organic agriculture, technical studies and policy analysis of the contribution of organic agriculture to food security, rural livelihoods and international trade, and dissemination of information on organic agriculture through country profiles and statistics.
- In recognition of the contribution made by the world's 500 million family farmers to agriculture, 2014 was declared the International Year of Family Farming (IYFF). The IYFF, through its awareness-raising activities, advocacy strategy and consultative policy dialogue

process initiated by Regional Dialogues has proven instrumental in improving the knowledge and information as well as the public perception of family farming. FAO's Family Farming Knowledge Platform is a lasting legacy of the IYFF, gathering digitized quality information on family farming from all over the world; including national laws and regulations, public policies, best practices, relevant data and statistics, research, articles and publications. FAO Regional Initiatives in Latin America and the Caribbean, the Near East, and Europe and Central Asia focus explicitly on family farming.

- The prospective Decade of Family Farming offers a great opportunity to align activities in support of agroecology at local, national and global levels. In particular, there are opportunities for collaboration in the areas of awareness and knowledge creation, promoting best agroecological practices for smallholder and family farmers, increasing investments in agroecology, and contributing to relevant SDGs. Participants called on FAO and IFAD, as leaders of the UN Decade of Family Farming (2019-2028), to boost awareness of agroecology as an important approach for strengthening family farming.
- The Pastoralist Knowledge Hub seeks to fill the gaps identified over the past years, especially the lack of global policy discussions on pastoralism and the need to bring attention to the challenges faced by pastoral communities. By systematizing available information, literature and knowledge as well as technical tools, assessments and research results, the Hub also aims to better inform evidence-based decision making at all levels.
- FAO's climate change strategy breaks itself down into a number of activities and is embedded in broader frameworks such as FAO-Adapt, Climate-Smart Agriculture and the Disaster Risk Reduction for Food and Nutrition Security Framework. The scaling up of agroecology will be a key element in the implementation of the strategy in the field.
- The Domestic Animal Diversity Information System (DAD-IS), maintained and developed by FAO, provides access to searchable databases on livestock breeds and their diversity. It includes the Global Databank for Animal Genetic Resources and provides tools for monitoring and managing breed diversity, as well as contacts for the National and Regional Coordinators for the Management of Animal Genetic Resources.
- The Global Framework on Water Scarcity in Agriculture (Wasag) has been designed to bring together key players across the globe and across sectors to tackle the collective challenge of using water better in agriculture. It is an initiative for partners from all fields and backgrounds to collaborate in supporting countries and stakeholders in their commitments and plans related to the 2030 Sustainable Development Agenda and the Paris Climate Agreement.
- FAO recognizes that Civil Society Organisations (CSOs) play a critical role in the fight against hunger given their technical expertise, their proximity to and representation of the hungry and poor, and their increasing presence in the field. It appeals to their knowledge and capacity on a variety of issues related to food security. FAO works to enhance the quality, number and impact of FAO's relations with CSOs at the global, regional and national level, and provides the regional and decentralized offices with guidance and advice they may need for successful collaboration with CSOs.

» FAO has supported field work, as well as research on indigenous peoples' food systems, agroecology, tenure and developed a guide on applying the principle of Free Prior and Informed Consent.

» An Agroecology Knowledge Hub[22] was created in FAO in 2016 and has received more than 40 000 visits to its database of over 800 references that are directly linked to agroecology. Furthermore, FAO sends a monthly newsletter to over 1 500 international actors informing them of its activities and achievements on the agenda.

Other initiatives on which FAO works with other UN agencies and bodies could contribute significantly to scaling up agroecology, such as The Global Initiative on Decent Jobs for Youth, the Rome-based Agencies collaboration on Home-Grown School Meals and the Sustainable Food Systems Programme of the 10-Year Framework for Programmes on Sustainable Consumption and Production Patterns (10YFP).

AGROECOLOGY AND THE SDGs

The 2030 Agenda for Sustainable Development calls for a transformation in food and agricultural systems. The Agenda is a framework for achieving integrated sustainable development in its three dimensions: environmental, social and economic. It calls for all people to be critical agents of change in the process. The agroecological transition can be seen as key to transforming food and agricultural systems. Growing scientific evidence and local experiences demonstrate how agroecology facilitates and contributes to transitions to food and agricultural systems that are environmentally sustainable, economically fair and viable and socially equitable, embracing the spirit of the 2030 Agenda.

Rural people make up nearly 80 percent of the extreme poor, and number 3.5 billion. To eradicate extreme poverty, reduce the greatest inequalities, and foster inclusive growth, we must promote a rural transformation that empowers rural people as critical agents of change. Policies and programmes improving the livelihoods and resilience of smallholder farmers, foresters, fishers, pastoralists, and labourers, with particular focus on rural women, indigenous peoples and youth – including through agroecology – can make or break achievement of the SDGs in most countries.

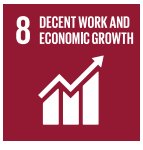
An analysis of the SDGs shows that agroecology as a systemic approach contributes directly to many of the goals (see table 3):

Eradication of poverty (1), hunger (2), healthy lives (3), ensuring quality education (4), achieving gender equality (5), increasing water-use efficiency (6), promoting decent jobs (8), reducing inequalities (10), making cities and human settlements inclusive, safe and sustainable (11), ensuring sustainable production and consumption (12), building climate resilience (13), sustainable use of oceans (14) and halting the loss of biodiversity (15).

The elaboration of an initiative to scale up agroecology could contribute to a peaceful and inclusive society (16) and strengthen the partnership for sustainable development (17).

[22] www.fao.org/agroecology/en

Table 3 Agroecology contribution on SDGs

	TARGET EXTRACTS
	» Reduce by half the proportion of men, women and children living in poverty (1.2) » Equal rights for men and women to natural resources and technology (link with 1.4) » Build the resilience of the poor and reduce their exposure and vulnerability to climate related events and other socio economic shocks and disasters (1.5)
	» End hunger (2.1) and all forms of malnutrition (2.2) » Double the agricultural productivity and incomes of small-scale food producers (2.3) » Ensure sustainable food production systems and implement resilient agricultural practices that help maintain ecosystems (2.4) » Maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species (…) and promote fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge (2.5)
	» Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination (3.9)
	» Endure equal access for all women and men to affordable and quality education (4.3) » Substantially increase the number of youth and adults who have relevant skills, for employment, decent jobs and entrepreneurship (4.4) » Eliminate gender disparities in education (4.5)
	» End all forms of discriminations against women and girls everywhere (5.1)
	» Improve water quality by reducing pollution (6.3) » Substantially increase water-use efficiency (6.4) » Implement integrated water resources management (6.5)
	» Support productive activities, decent job creation, entrepreneurship, creativity and innovation (8.3) » Achieve full and productive employment and decent work for all (8.5) » Reduce the proportion of youth not in employment, education or training (8.6)
	» Empower and promote the social, economic and political inclusion of all (10.2)

TARGET EXTRACTS

» Strengthen efforts to protect and safeguard the worlds cultural and natural heritage (11.4)

» Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns (10YFP) (12.1)
» Achieve the sustainable management and efficient use of natural resources (12.2)
» Halve per capita global food waste (12.3)
» Achieve the environmentally sound management of chemicals and all wastes (12.4)
» Reduce waste generation through prevention, reduction, recycling and reuse (12.5)
» Promote public procurement practices that are sustainable (12.7)
» Rationalize inefficient fossil-fuel subsidies (12.c)

» Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters (13.1)
» Integrate climate change measures into national policies, strategies and planning (13.2)
» Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning (13.3)

» Sustainably manage and protect marine and costal ecosystems (...) and take action for their restoration (14.2)
» Effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans (14.4)

» Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services (15.1)
» Promote the sustainable management of all type of forests (15.2)
» Combat desertification, restore degraded land and soil (15.3)
» Ensure the conservation of mountain ecosystems, including their biodiversity (15.4)
» Reduce the degradation of natural habitats, halt the loss of biodiversity (15.5)
» Promote fair and equitable sharing of the benefits arising for the utilization of genetic resources and promote appropriate access to such resources (15.6)
» Integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts (15.9)

» Ensure responsive, inclusive, participatory and representative decision-making at all levels (16.7)

» Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation (17.6)
» Enhance international support for implementing effective and targeted capacity building in developing countries (17.9)

TOWARDS THE SCALING UP AGROECOLOGY INITIATIVE

On the occasion of the Second International Symposium on Agroecology in April 2018, FAO will launch the Scaling up Agroecology Initiative with the support of its partners in the United Nations system as well as all actors who have been increasing the momentum of agroecology on the ground for several decades.

AN INTERNATIONAL AND GROUNDED MOBILIZATION FOR AN AGROECOLOGICAL TRANSITION

FAO's multistakeholder dialogues at international and regional levels (2015–2017) in Latin America and the Caribbean, sub-Saharan Africa, Asia and the Pacific, Europe and Central Asia and the Near East and North Africa have brought together more than 1 400 participants representing 170 Members and nearly 500 organizations at local, national, regional and international levels.

The need to take agriculture towards sustainability was clear, and the FAO seminars revealed the number and diversity of existing approaches. They showed the high expectations for a change to the present model urgently in order to address the many current challenges.

The need for scaling up agroecology was emphasized in every seminar, with the premise that different situations call for different practices. Given the transformational nature of agroecology and the fact that farmers at grassroots level, civil society and a growing proportion of the scientific community are applying this approach, it can be a powerful tool for achieving the SDGs. The global environmental benefits of agroecology also contribute to the implementation of the commitments made in the context of the three Rio Conventions (Framework Convention on Climate Change, Convention on Biological Diversity, United Nations Convention to Combat Desertification), to which most countries with drylands are signatories.

BUILDING ON COMMON RECOMMENDATIONS FROM THE REGIONAL SEMINARS

The participants of the regional seminars made recommendations regarding all stakeholders (public organizations, academia, civil society actors and the private sector) for the development of agroecology. These recommendations (reviewed in detail in Section 2) can give an insight into the priority activities to be undertaken to scale up agroecology.

Strenghtening the central role of producers and their organizations in safeguarding, utilizing and accessing natural resources

- Recognizing, preserving and utilizing traditional knowledge and culture;
- Promoting the dynamic management of biodiversity and use of local and traditional crops and breeds;

- Supporting product diversification and integration of cropping, livestock, aquaculture and forestry;
- Restoring and enhancing soil quality and fertility;
- Guaranteeing access to and use of productive natural resources for small-scale producers (land, water, forests, fisheries and genetic resources).

Fostering experience and knowledge sharing, collaborative research and innovation

- Developing farmer-led and participatory research and co-innovation;
- Developing interdisciplinary and transdisciplinary research and filling research gaps;
- Promoting technical, social and institutional innovations for agroecology;
- Setting up multistakeholder cooperation platforms;
- Investing in capacity development, including support for agroecology training initiatives among grassroots organizations.

Promoting markets for agroecology based products and services

- Supporting short food supply chains and innovative markets such as public procurement schemes;
- Raising consumers' awareness of the benefits of agroecological products, including nutritional quality and health;
- Developing solidarity-based economies and private sector engagement;
- Promoting territorial approaches and the transition to circular food systems.

Reviewing institutional policy, legal and financial frameworks to promote agroecological transitions for sustainable food systems

- Developing public policies and initiatives with appropriate funding to foster agroecological transitions;
- Considering the specific needs of family farmers, including women and youth, by including them in policy development;
- Implementing integrated food policies and guidelines with greater coherence and long-term thinking;
- Considering the externalities of agriculture and drawing up multicriteria indicators to measure the long-term performance of agroecological systems.

BUILDING ALLIANCES TO SCALE UP AGROECOLOGY

UN agencies and bodies, governments and non-state actors must come together in a collaborative spirit if the potential of agroecology is to be achieved. Each has their specific roles and responsibilities, and each is indispensable. UN agencies and bodies can enhance synergies with ongoing UN efforts – mainly the 2030 Agenda, but also the UN Decade of Family Farming, the Global Initiative on Decent Jobs for Youth, the Rome-Based Agencies collaboration on Home

Grown School Meals and the Sustainable Food Systems Programme of the 10-Year Framework for Programmes on Sustainable Consumption and Production Patterns.

FAO, as both a normative and operational body, has a rich range of activities, instruments and experiences that are relevant for scaling up agroecology. FAO should take an active leadership role in scaling up agroecology and in ensuring the engagement of other partners in the Initiative.

Governments advise FAO and its partners on priorities and strategies and can team up to implement specific activities. There are opportunities for cooperation with regional bodies such as the Community of Latin American and Caribbean States to support regional cooperation on agroecology. It will also seek cooperation with relevant targeted initiatives, such as the G20 Initiative for Rural Youth Employment. Non-state actors, including farmers' organizations, civil society, research institutions and the private sector, collaborate to implement specific activities on an ad hoc basis.

Non-state actors have played a vital role in developing, implementing and advocating for agroecology. Family farmers have developed the knowledge, capacities and networks that must be at the core of creating sustainable food systems. National, regional and international research institutions are pioneering transdisciplinary research to tackle complex problems facing food and agricultural systems. NGOs raise public awareness, engage in research, and often support marginalised groups, including family farmers. Consumers and the private sector create the demand and also opportunities for inclusive and equitable food systems.

AGROECOLOGY FOR ZERO HUNGER

FAO stands for the belief that we can achieve Zero Hunger if we work together. Ending poverty and hunger by 2030 is feasible – if we tackle root causes by bringing real transformative change to how we produce, distribute and consume food. Speaking at the Regional Meeting on Agroecology in sub-Saharan Africa, the FAO Director-General, José Graziano da Silva, stated that the SDGs renew global commitment to tackle the big challenges of ending hunger, achieving food security and improving nutrition, and promoting sustainable agriculture. To achieve this by 2030, in just 12 years, we need to make an urgent shift to sustainable food systems that produce more with less environmental costs. "Agroecology offers a promising and innovative solution," Graziano da Silva added. He also underlined the central role of millions of smallholder and family farmers: "They produce most of our food. But with climate change, farmers need even more the support of public policies to continue playing this essential role".

Working together through the Scaling up Agroecology Initiative can have a catalytic impact, enabling and empowering Members, communities and family farmers to scale up agroecology and achieve the transformative vision of the 2030 Agenda: A world composed of sustainable and inclusive food and agricultural systems, where the health of both people and planet thrives; where food security and nutrition is assured for all present and future generations; where the scourge of poverty is eliminated; where the fundamental contributions of women are valued and respected; and where core human values of dignity, freedom, equity and human rights are upheld. Agroecology provides pathways to help achieve this bold and transformative vision.

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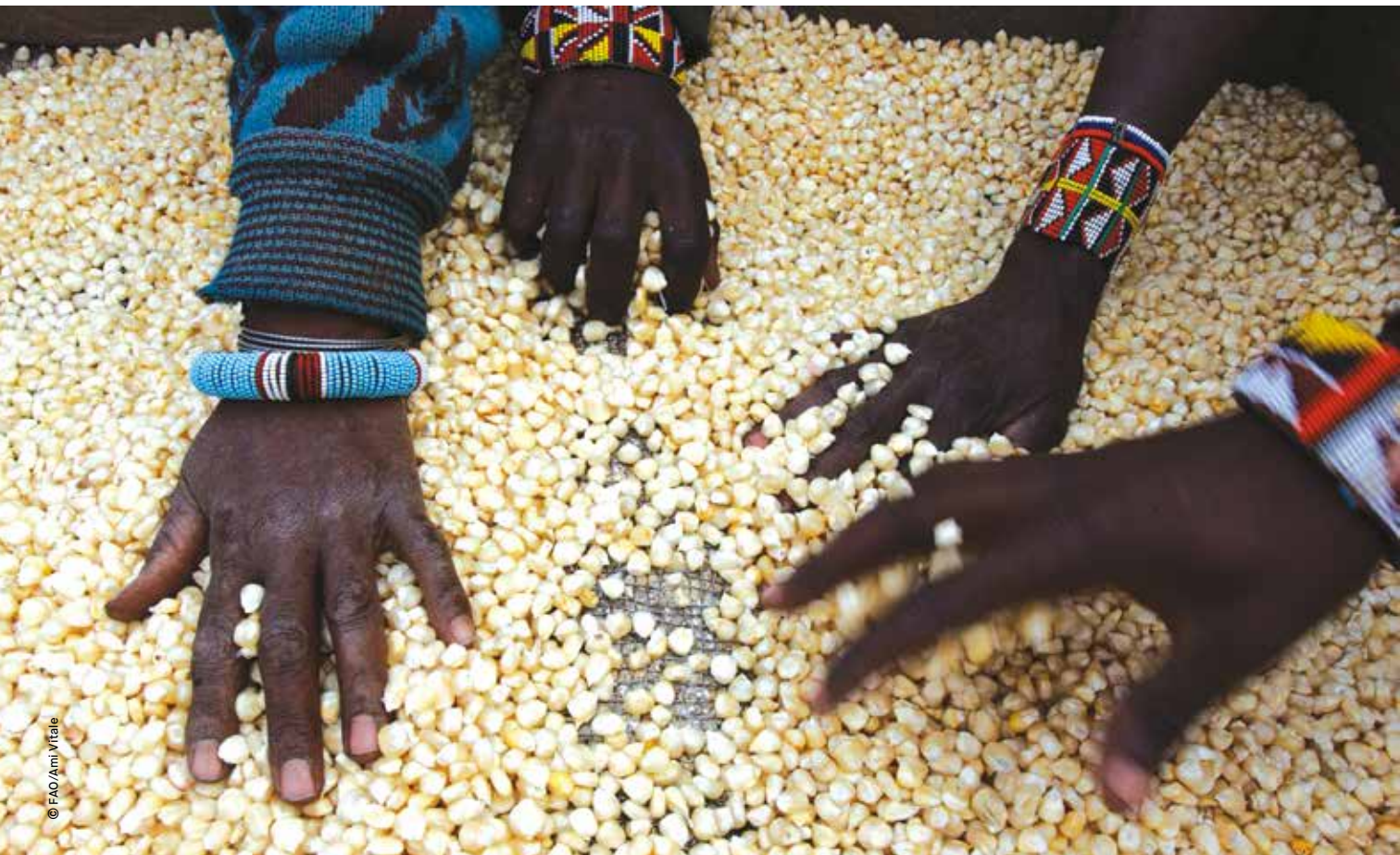

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ANNEXES

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ANNEX 1
KEY MESSAGES FROM THE REGIONS

ASIA AND THE PACIFIC

KEY MESSAGES FOR STRENGTHENING AGROECOLOGY

- The Asia-Pacific region (APR) is one of great diversity and dynamic change. Increases in production and overall economic growth have contributed significantly to achieving food security aims, but this formula may not hold true in the future. In addition, sub-regional disparities remain. The prevalence of underweight children as well as stunting and wasting is higher in southern Asia than anywhere else in the world.
- Despite important advances, the region faces a number of challenges in achieving food security and nutrition for all. These include the adverse effects of climate change, frequent natural disasters, environmental degradation, uneven outcomes of economic development and persistent poverty, discrimination against women, insecure tenure and increasing demands on land and water resources, animal and plant pests and diseases, youth migration, and ageing farmer populations.
- This densely populated region occupies a unique position in world agriculture: with 40 percent of the world's land area and 60 percent of the global population, it is home to 70 percent of the world's family farmers, including fisherfolk and herders. These family farmers are responsible for about 80 percent of the region's food production. Despite impressive economic growth, APR is home to 490 million people still suffering from chronic hunger and accounts for 62 percent of undernourished people in the world. The share of females in the agriculture labour force ranges from 35 percent in southern Asia to 52 percent in the Pacific.
- The Green Revolution led to a quantum leap in food production and bolstered world food security. In many countries however, intensive crop production has depleted agriculture's natural resource base, jeopardizing future productivity. Over the past 40 years, natural resources in APR have been subject to increased degradation including deforestation, excessive groundwater extraction, excessive applications of chemical fertilizers and pesticides, leading to depleted soil health, and increasing water and atmospheric pollution. Inland, coastal and oceanic waters are impacted by heavy fishing pressures and habitat degradation.
- With changes in dietary patterns, many people in the region now consume excessive amounts of sugar and fats, leading to obesity and poor health outcomes. The rapid emergence of non-communicable diseases and vitamin and mineral deficiencies create a simultaneous double burden of overnutrition and undernutrition. On a more positive note, there is also growing awareness of the health benefits of certain foods such as fruits, vegetables and fisheries products that offer significant opportunities for trade and market development in the region.

- Agroecological approaches are increasingly promoted in the region, sometimes with policy support, particularly due to concerns over natural resource degradation. These approaches, building on a rich heritage of traditional agricultural systems, include decade-long experiences with Integrated Pest Management, System of Rice Intensification, Farmer Field Schools, agroforestry, integrated rice-fish systems, and growing markets for sustainable agriculture. The region is home to numerous networks on relevant topics such as IPM or agroforestry (though more efforts are needed to reach the most marginalized farmers).
- Non-governmental organizations, communities, local initiatives and farmers' organizations, as well as an increasing number of committed consumers, are playing a crucial role in the expansion of agroecological approaches. In India, Zero Budget Natural Farming (ZBNF) is an example of a rapidly growing farmer-led agroecological movement that promotes the exclusive use of resources found on the farm. At the same time, consumers are increasingly demanding healthy, safe and nutritious food and in some cases, policy makers are responding.
- Policy makers are starting to mobilize the force of public policies to end environmental pollution. China has recently adopted an ecological compensation mechanism, which encourages the return of farmland on steep slopes to forest and grasslands, the balance between grass growth and animal production on pasturelands, and the reform of rural renewable energy.
- While many successful and promising applications of agroecology exist at local levels, and some have been scaled up through policy support, such efforts to date have been far from systematic and have often been neglected by mainstream public funding.
- Moving forward, the challenge is to increase support for such ecological approaches while strengthening the integration of the economic and social dimensions of sustainable development, for example through enhancing access to land, improved public services and support for gender equity.
- FAO has played a catalytic role in providing a neutral platform for exchange of experiences on agroecology through a regional meeting and an international symposium on agroecology in China. It has further transmitted the outcomes of these exchanges to policy makers through the FAO Regional Conference. The multi-stakeholder seminars conducted by FAO in recent years have provided a solid base of elements on the state of agroecology in Asia and the Pacific, the challenges that hinder its development, and the main drivers that require special support to overcome obstacles and allow agroecological transitions at higher scales at regional and national levels.
- Agroecology could contribute to the following priorities in the region:
  - Regional Initiative on Zero Hunger
  - Regional Initiative on Blue Growth
  - Regional Initiative on Climate Change
  - Regional Initiative on One Health

The recommendations issued by the participants to develop agroecology in the region are presented in Annex 2.

THE NEAR EAST AND NORTH AFRICA

KEY MESSAGES FOR STRENGTHENING AGROECOLOGY

- Strengthening agroecology in the Near East region entails facing a wide range of natural and human-made shocks, including: frequent incidences of droughts, a degrading natural resource base, desertification, chronic shortage of water that is exacerbated by climate change, transboundary animal and plant pests and diseases, socioeconomic difficulties and instability, including protracted crises, and a combination of natural and human-induced factors. The region has the highest number and intensity of conflicts in the world.
- The number of chronically undernourished people in the region in 2010-13 reached 79 million, representing 11.2 percent of the population. On the other hand, nearly one quarter of the population in the region is obese. Agriculture is a vital economic and social sector in the region, contributing on average to 14 percent of gross domestic product (excluding oil-rich countries) and providing jobs and incomes for 38 percent of the region's economically active population. Small-scale and family farming provides more than 80 percent of agricultural production, including vast rain-fed areas and rangelands, and plays an important role in food security, poverty alleviation and in sustainable management of natural resources.
- The most important challenge in terms of natural resources is the chronic shortage of water and perhaps the most severe levels of water scarcity in history. The steady increase in agricultural production in most countries of the region in recent decades is largely the result of intensification in irrigation. Often, such interventions have ultimately encouraged overuse of water, in particular groundwater resources, and called into question the sustainability of food systems. Agriculture, which already consumes more than 85 percent of available fresh water resources in the region, will most likely have to absorb the bulk of water scarcity, with possible major consequences for food security and the rural economy. In the Near East region, climate change impacts will principally be felt through the scarcity of water, in terms of reduced water availability and quality, increased crop demand for water, increased aridity and loss of biodiversity.
- Regions identified as the most vulnerable to climate change are also regions where farmers, pastoralists and rural communities rely the most on livestock for income and livelihood, and where livestock is expected to contribute more to food security and better nutrition. Traditionally, livestock keepers have been capable of adapting to livelihood threats and, in some situations, livestock keeping is itself an adaptation strategy, in particular in pastoral communities where livestock have always been the main asset to face harsh climatic conditions.
- Rain-fed systems dominate world food production and support 62 percent of farming households in the Near East region. However, variable rainfall, dry spells and droughts jeopardize rain-fed farming, pasture management and aquaculture. Given limitations on the expansion of irrigated farming and the need to reduce it in cases of extreme water scarcity, a key priority must be strengthening rain-fed agriculture by improving soil moisture conservation and, where small water storage is feasible, providing supplemental irrigation.

- Agroecology in the Near East region is rooted in ancient agroecological heritage systems based on small-scale and family farming, such as oasis agriculture, traditional water harvesting systems, transhumant pastoralism, and artisanal fisheries. Such systems have been under severe environmental, economic, and social pressures in the past decades, and their continued survival is a testimony to their resilience. Traditional agricultural systems in the region, some of which are recognized as Globally Important Heritage Agricultural Systems (GIAHS), show that polycultures and mixed systems offer important benefits in drylands. These include date palm plantations with an understory of olive trees, fruit trees and vegetables. The oasis system in the Atlas Mountains of Morocco produces vegetables, cereals and fruits in conjunction with pastures for animals. These systems support livelihoods by growing food and raising livestock, preserving water and biodiversity, crop rotation and agroforestry organized by efficient water management systems.
- Despite a general trend of public support for input-intensive farming systems, the Near East region has also developed important experiences related to sustainable agriculture and for smallholder livelihoods, often supported by NGOs and the research community. Current agroecological approaches can build on these experiences and support a more integrated approach to the multiple objectives of environmental, social and economic development.
- FAO has contributed to a nascent discussion on the potential contribution of agroecology to sustainable food systems in the region by supporting policy dialogues on the role of agroecology in climate change adaptation at the FAO Regional Conference for the Near East (April 2018). It also organized a regional consultation on agroecology in Tunis in November 2017, which led to a number of key messages and concrete proposals. In a region facing extreme water scarcity, agroecology emphasizes the need to: 1) prioritize irrigation for agroecological systems that conserve and enhance the natural resource base; 2) strengthen long-neglected rain-fed agricultural systems; and 3) support for transhumant pastoralism and sustainable rangeland management. Items 1) and 2) require 4) improved soil quality, and items 1), 2) and 3) require 5) adapted genetic resources. All items require 6) appropriate research and knowledge sharing systems.
- Agroecology could contribute to the following priorities in the region:
  - Regional Initiative on Water Scarcity
  - Regional Initiative on Small-Scale Family Farming
  - Regional Initiative on Building Resilience for Food Security

The recommendations issued by the participants to develop agroecology in the region are presented in Annex 2.

SUB-SAHARAN AFRICA

KEY MESSAGES FOR STRENGTHENING AGROECOLOGY

- Agriculture is the backbone of African economies, accounting for as much as 40 percent of total export earnings and employing 60-90 percent of Africa's labour force. More than half of household income originates in the agriculture sector. Using the targets set out in the Malabo Declaration, African governments now need to unlock the continent's agriculture sector in a way that captures the synergies between climate change adaptation and mitigation. A sustainable agroecological transition has the potential to contribute to food and nutrition security, poverty reduction and sustained economic growth, in a way that preserves the natural resource base on which the region depends.
- Sub-Saharan Africa (SSA) faces chronic food and nutrition insecurity and hunger. The number of chronically undernourished people increased from 20.8 percent in 2015 to 22.7 percent in 2016, and 31 percent of the population suffers from severe food insecurity. In view of such challenges, agroecological integrated approaches which favour biodiversity and sustainable farming have an important role to play in achieving healthy nutrition for all. Polycultures and mixed crop-livestock farming systems ensure that key nutrients are available throughout the year, allowing food to be saved for dry periods, and therefore providing protein during hunger gaps. Such evidence shows that agroecologically-sustained biodiversity allows dietary diversity to bring major nutrition and health benefits and achieve SDG target 2.2, promoting sustainable food and security where it is most needed, in contribution to Africa's commitment to end hunger by 2025.
- In SSA, more than 10 million new jobs per year will have to be created in rural areas in the next two decades to absorb the new entrants in the labour force. In the context of youth migration from rural areas, there is a largely untapped reservoir of employment opportunities in agroecology, such as promoting rural decent employment, green innovative jobs and green entrepreneurship, which translates into the creation of local markets, community-based economies and sustainable rural development. The agroecological transition can break the vicious cycles of youth migration by creating an integrated site-specific farming system that is based on low-cost inputs, local innovations and the recycling of by-products and waste, which strives to harness the synergies and services provided by the ecosystem in which it is practiced, in turn creating products with specific qualities that reflect the potentials of the territory.
- Currently, about 33 percent of world soils are moderately to highly degraded. Forty percent of these soils are located in Africa. Climate stresses accelerate land degradation, hamper water availability, limit crop and animal productivity and increase season length. Smallholders across Africa are now more motivated than ever to continue implementing agroecological innovations and regenerative farming methods to use natural resources for food production in the most efficient way.

- Furthermore, it is estimated that by 2020, nearly 60 million people will have left the deserted areas of SSA for economic reasons. In view of such challenges, agroecological approaches start by restoring soil life in order to re-establish and/or enhance the multiple soil-based biological processes and build on local farmers' knowledge through farmer field schools and other participatory scientific approaches. Such adaptation and mitigation practices, linked with collective organization that empowers communities, contribute to improving the management of all agroecosystem components, strengthening resilience to climate change and improving the global system functioning and overall productivity. These approaches can be scaled up through implementation of the Regional Initiative on Building Resilience in Africa's Drylands, in contribution to SDG 13.
- Given Africa's biodiversity, natural resources and ecosystems, issues related to participatory governance become especially relevant to ensure agroecological transitions to sustainable development. Territorial, ecosystem and landscape approaches allow farmers to integrate financial, physical and natural resources across SSA production zones as well as enabling participation in high-level policy discussions which support local economies, local job creation, and local nutrition security. This approach is especially accurate in SSA to regenerate rural livelihoods, reduce the rural exodus of youth and limit producers' dependence on input supply chains.
- Furthermore, the estimated population growth in Africa will bring the focus to sustainable and local food systems. As the internal market grows, local national capacities for sustainable local consumption should be enhanced. The diversification of products inherent in agroecological systems, which generally involves local and cultural traditions, lends itself to market configurations based on short value chains, which favour the emergence of local networks made of strong social and economic relationships. Agroecological consumption can be promoted through the FAO Regional Initiative on Sustainable Production Intensification and Value Chain Development in Africa, which takes a holistic approach to enhanced agricultural diversification, productivity and competitiveness, in a value chain context, in contribution to SDG 8.
- Community seed systems and seed autonomy in Africa are important drivers of successful agroecological transitions among women and youth. Seed programmes engaging women and youth play an important role in combining traditional indigenous knowledge with science, participatory research and extension, preserving the cultural identity of many African communities and catalysing innovation for improvement. Therefore, seeds represent an important entry point for sustainable agroecological development in SSA, creating possibilities for the delivery of multiple benefits for smallholder farmers, including improved nutrition, productivity and resilience in the face of climate change.
- In SSA, agroecological principles and innovations are not yet widely incorporated or mainstreamed in the current agricultural development models and due to agroecology's interdisciplinary nature (agronomy, ecology, social sciences, etc.), multi-stakeholder and participatory mechanisms need to be in place at local levels, in line with adapted policies.

- A blend of modern science and indigenous knowledge is required to harness the immense stores of African cultural, medical, and scientific knowledge, to face the challenges of increasing agricultural production and to manage the environment on a sustainable basis. In this regard, recommendations and initiatives focus on the creation of platforms and systematization of data on local agroecological innovations to ensure appropriate knowledge sharing among farmers, local relevant actors and to inform policy making processes.
- Current obstacles in SSA to an effective agroecological transition include lack of support, subsidies and regulations that prevent farmers from receiving fair prices for their products. South-South cooperation can be an effective tool to share best policy practices from other regions and countries. Likewise, supportive institutional frameworks for the use of biological alternatives are needed to effectively decrease the use of chemicals in agriculture.
- Furthermore, agroecological transitions are currently underfunded and understudied, requiring adequate public investment in research and technical assistance. In SSA, most policies still actively encourage farming that is dependent on fossil fuel-based inputs and causes negative environmental externalities. In particular, investments are required for the adoption of agroecological methods and local adaptive knowledge through local extension services.
- Agroecology could contribute to the following priorities in the region:
  - Sustainable Production Intensification and Value Chain Development
  - Partnership to End Hunger
  - Building Resilience in Africa's Drylands

The recommendations issued by the participants to develop agroecology in the region are presented in Annex 2.

EUROPE AND CENTRAL ASIA

KEY MESSAGES FOR STRENGTHENING AGROECOLOGY

- The Europe and Central Asia (ECA) region encompasses a great deal of economic, social and natural diversity. Agriculture plays an important role in the economy of most countries in the region. On average, 45.4 percent of the ECA population lives in rural areas, though there are variations from country to country. Migration from rural areas has been accelerating since 2000 in most countries. While the average female share of the agricultural labour force is 37 percent, rural women tend to be marginalized, either primarily in the self-employed sector or in casual, temporary, informal, unpaid or part-time jobs.
- Micronutrient deficiencies, overnutrition and unhealthy diets in children and adults are major malnutrition concerns across ECA countries. Such challenges can be addressed through agroecological transitions which help preserve family farms and improve producers' income and resilience by relocating products, upholding value-added on farms, and using ecosystem services and farm products rather than manufactured goods.
- Environmental challenges include deforestation, land degradation, desertification, salinization, and loss of valuable agricultural biodiversity and pollinators. Climate change has become manifest through an increased number of extreme weather events and natural hazards such as floods and landslides, changes in water resource availability, natural resource degradation and loss of biodiversity. Agroecology can restore the quality of soils, terrestrial and aquatic ecosystems and pollinator populations through the diversification of production and the consequent decline in external input use, in contribution to the Regional Initiative on Sustainable Natural Resources Management in a Changing Climate and to SDG 13.
- Family farms in the ECA region account for the bulk of agricultural production but face many challenges such as lack of access to reliable and stable markets, inputs, financing and extension services. Rural economies across the ECA region are characterized by limited non-farm employment opportunities and income diversification sources. Agroecology can promote farm independence, particularly energy independence, by using more economically-efficient practices and fostering recovery and recycling techniques for in-farm organic elements, in contribution to the Regional Initiative on Empowering Smallholders and Family Farms for Improved Rural Livelihoods and Poverty Reduction, in contribution to SDGs 1, 2 and 3.
- Awareness of, and debate on, agroecology is uneven throughout the region. In central Asia, efforts need to be made to raise awareness on agroecology, particularly in relation to sustainable management of natural resources in the context of climate change. In western Europe research has strongly shaped the current understanding of agroecology today and more than 25 universities host international researchers and offer courses on agroecology. European Union standards on organic farming have contributed to fostering innovations in agroecological systems. Sustainable agriculture and practices have been promoted through a combination of policies in many countries, such as supporting biodiversity and ecosystem services and organic farming, while several countries have specific policies and programmes on agroecology.

- In terms of challenges to the further promotion of agroecology, there is much debate about market-related issues. Governments have an important role to play in the development of innovative market models and have a key role in building local economies and markets, as they govern food chains. They could, for example, provide subsidies to establish local markets, regulate markets to ensure fair prices for farmers, and adapt procurement protocols to the local realities of agroecological production. Another area of concern is technological innovation models that involve private intellectual property rights that could be incongruent with farmers' autonomy (which is an important element of agroecological approaches).
- Agroecology could contribute to the following priorities in the region:
  - Regional Initiative on Empowering Smallholders and Family Farms for Improved Rural Livelihoods and Poverty Reduction
  - Regional Initiative on Sustainable Natural Resources Management in a Changing Climate

The recommendations issued by the participants to develop agroecology in the region are presented in Annex 2.

LATIN AMERICA AND THE CARIBBEAN

KEY MESSAGES FOR STRENGTHENING AGROECOLOGY

- The world's largest arable land reserves are concentrated in Latin America and the Caribbean (LAC), with 576 million hectares, equivalent to approximately 30 percent of its territory. Six countries in the region host between 60 and 70 percent of all life on the planet. However, the rapid exploitation of these resources threatens the very basis of regional food security, the wealth that has allowed the region to take a leap forward towards the eradication of hunger and poverty.
- LAC is one of the regions with most progress in the last 20 years, reducing the percentage and total number of people suffering from hunger. However, about 360 million people are overweight in the region, representing 58 percent of the population. Even more seriously, obesity affects 140 million people (23 percent of the population). This is due to a change in diets and eating patterns, added to the economic growth of the last decades and the integration to international markets that has reduced the consumption of traditional and native foods. Combating hunger and all forms of malnutrition requires a healthy diet that includes fresh, healthy and nutritious foods produced in a sustainable manner.
- The SDGs oblige the region to seek approaches and models of development that guarantee sustainable progress. These challenges reinforce agroecology's role as an articulating approach in food systems that demand more attention to nutrition and the right to adequate food, in contribution to the Hunger-Free Latin America and Caribbean Initiative, for the achievement of SDGs 1, 2 and 3.
- Climate change adds another challenge, since ending hunger and malnutrition in LAC requires adapting to its effects and mitigating its consequences, with the increasing frequency of disasters and extreme weather events. One-third of the regional population lives in areas highly exposed to threats and the agricultural sector is one of the most vulnerable. These conditions give special relevance to agroecology as an integral solution to the environmental, economic and social threats, in contribution to FAO's Regional Initiative 3 (Sustainable use of natural resources, adaptation to climate change and disaster risk management) and provides clear opportunities to strengthen the inclusion of agroecological approaches in the sustainable development plans of countries, specifically to achieve SDGs 2, 5, 6, 9, 11, 13, 14 and 15.
- In LAC, family farmers are the leading actors in agroecology in the field. In the region, 80 percent of farms are in the family farming system, making it the main source of agricultural and rural employment. Not only do they produce most of the food for internal consumption in the region, but they also usually carry out diversified agricultural activities, guaranteeing the sustainability of the environment and the conservation of biodiversity. That is why today, agroecology is promoted and claimed by social movements that have strong ties to family farming and food sovereignty. An enabling framework to scale up agroecological transitions to ensure food sovereignty and the development of family farming is Regional Initiative 2

'Family farming and inclusive food systems for sustainable rural development', which seeks to improve the access of family farmers to land, water, energy, infrastructure and necessary services to strengthen their production, management and organization. It also promotes the adequate representation of family farmers and their participation in food systems. This work contributes to the achievement of SDGs 1, 2, 5, 8, 10 and 12.

- Given the rapid exploitation of natural resources exacerbated by the growing impact of climate change, high levels of malnutrition and low access to adequate food, it is essential to ensure sustainable governance of land, natural, genetic and productive resources that guarantee nutrition security in the region. In this regard, a key factor in the agroecological transition is the conservation and production of local and native seeds, the support for community seed banks, and the development of cooperation and participative research in the production of seeds and seedlings.
- In terms of challenges for the further promotion of agroecology, in recent years agroecology has been driven by some governments through public policies that promote and shine a light on its important contribution to food sovereignty, food security and sustainable management of natural resources and ecosystems. However, all too often these policies are not effectively implemented due to a lack of regulations, failure to allocate the necessary budget, or high levels of inconsistency and incoherence with other existing legal frameworks that hinder sustainable transitions and favour the continuation of systems with a high impact on environmental degradation and on the health of the population. Furthermore, the impact of agroecological practices and their contributions to sustainable development remain almost invisible in official statistics, which makes it difficult to develop appropriate instruments.
- Given this context, political commitments reflected in regional instruments are needed, along with reinforcements in the formulation of policies and regulations at national levels, to accelerate an integral transformation of food production models that are consistent and coherent with each other. There are some good examples to follow of inter-ministerial public policies that link agricultural development with social, economic and environmental sustainability dimensions.
- Although some countries have begun to incorporate agroecological approaches into their research agencies and extension programmes, there is a need for more public and private research and extension efforts appropriate to the specificity of agroecology (which are territorialized), and a change of paradigm in the training of agricultural extension agents, to strengthen agroecological transitions.
- In terms of market generation, the region has several lessons learned and positive experiences that need to be strengthened to scale up agroecological markets such as: short production and distribution circuits, participatory certification systems and institutional food purchasing programmes that strengthen agroecological family agriculture, among other institutional innovations.

- Following the Second FAO Regional Seminar on Agroecology held in La Paz, the Plurinational State of Bolivia, in September 2016, a regional agroecology agenda was agreed on by various sectors that integrates the recommendations and proposes the following lines of action: (1) governance for the construction and implementation of public policies on agroecology; (2) information generation, knowledge management and capacity development in agroecology; (3) promotion of markets that stimulate and favour agroecological production and consumption; and (4) restoration and valuing of agrifood systems with territorial identity.
- In November 2016, the Ministerial Declaration of the Community of Latin American and Caribbean States (CELAC) on Family Farming and Rural Development ratified Members' commitment to support the implementation of the regional agroecology agenda proposed at the FAO seminar in the Plurinational State of Bolivia. The Thirty-fourth FAO Regional Conference (Mexico 2016) recognized the importance of agricultural policies that focus on territories and agroecology, taking agroecology as fundamental for human rights and the transformation of the rural sector in Latin America, and sustainable use of natural resources, risk management and adaptation to climate change.

The recommendations issued by the participants to develop agroecology in the region are presented in Annex 2.

ANNEX 2
RECOMMENDATIONS OF THE FAO REGIONAL SEMINARS

LATIN AMERICA AND THE CARIBBEAN

Recommendations of the I Regional Seminar on Agroecology in Latin America and the Caribbean

BRASILIA, BRAZIL, 24–26 JUNE 2015

Agroecology in the region has been carried out in practice for decades; by social movements of small-holder farmers, rural groups, traditional communities, indigenous peoples, artisanal fisher folk, herders, and gatherers. It has a strong scientific base and is increasingly receiving support from governments through new public policies. The practices and elements of agroecology ensure food security and sovereignty, as well as strengthen family farming.

As a result of the International Symposium on Agroecology for Food Security, held in September 2014 by FAO within the framework of the International Year of Family Farming; the Regional Seminar on Agroecology in Latin America and the Caribbean was held in Brazil on 24-26 June 2015.

Within the framework of the Plan of Action 2015 of the ad hoc Working Group on Family Farming and Rural Development of CELAC and the Ministerial Declaration of CELAC on Family Farming, approved in November of 2014 in Brazilia, Brazil, and ratified in the Third Summit of Heads of State and Government (San Jose, Costa Rica- January 2015); declared "support for the convening of a regional event on agroecology to encourage the exchange of experiences and to promote policies of sustainable development."

Within the framework of REAF, in the XX Specialized Meeting on Family Farming of MERCOSUR (Caracas, the Bolivarian Republic of Venezuela, December 2013), the theme of agroecology was incorporated into the agenda of the Working Group on Climate Change Adaption and Risk Management.

Taking into account the Declaration of Nyeleni-Mali on Agroecology created by the social movements of small-holder farmers, rural groups, traditional communities, indigenous peoples, artisanal fisher folk, herders, gatherers, and youth;

The participants of the seminar; from social movements, the academic sector, representatives of public entities of the countries of Latin America and the Caribbean and guests from other regions, gathered in this Seminar, call upon the governments of the region, along with CELAC, FAO, REAF/MERCOSUR, and other relevant intergovernmental and international organizations to:

1. Promote public policies which boost agroecology and food sovereignty; defined, implemented and monitored with active participation of social movements and civil society groups, assuring the necessary budget for its implementation.

2. Formulate and implement legal frameworks and regulations which are favourable to agroecology, in order to achieve food sovereignty.
3. Assure the social role of land and water through agrarian reforms, land policies, and the guarantee of land rights of indigenous and native peoples and traditional communities. 3. Promote the production of healthy, adequate food as well as the food sovereignty of the region through agroecology; recognizing that those systems have a more sustainable approach to land, water and energy.
4. Recognize and value ancestral knowledge, traditions, local wisdom and cultural identities as a pillar of agroecology. Additionally, the public research institutions should respect and value the traditional knowledge, promoting a knowledge dialogue in their participatory research programs.
5. Foster territorial dynamics of social innovation and technology by creating and/or strengthening the pillars of agroecology and in institutions of an interdisciplinary and intersectoral nature; with capacity to articulate processes of education, research and learning.
6. Develop specific policies which promote the productive organization of women; supporting their agroecological initiatives, strengthening their abilities to overcome the obstacles that they face, the heavy workload, the decriminalization; recognizing their historic role in agroecology and food sovereignty.
7. Recognize and encourage the active role of families and communities, including women and youth, as guardians of biodiversity; especially seeds and genetic resources. In addition, ensure that genetic resources are restored by public germplasm banks, together with social movements; connecting the discussion on food sovereignty with the discussion on seed protection.
8. Create a regional network in Latin America (a shared platform between the governments and social movements) for the exchange of best practices and information regarding agroecology, which complements the dialogue between the academic sector, governments and social movements.
9. Create mechanisms which enable the reciprocity of participatory guarantee systems among the countries of the Latin American region by promoting the link between the producer and consumer.
10. Include agroecology as a permanent topic in the agenda of the working group on Family Farming and Rural Development of CELAC; expanding the participation of social movements and civil society and academic groups in the working group, with the support of FAO.
11. Create a program of exchange for agroecology and seeds, based on the working group of Family Farming and Rural Development of CELAC.
12. Recommend the creation of a specific working group in the REAF focused on agroecology and expanding the discussion on specific instances in which family farming includes agroecology.

13. Create conditions which restrict the practice of monoculture, the use of agro chemicals, and the concentration of land; in order to foster the increase of agroecological production by rural small-holder farmers in the region of Latin America and the Caribbean.
14. Support initiatives of formal and informal education, such as rural agroecological schools; increasing the level of education in rural areas through professional training of rural youth.
15. Recognize the multifunctional role that rural small-holder agroecology plays in preserving soils, water, biodiversity, as well as other ecological functions; guaranteeing environmental preservation in a socially inclusive and economically just manner.
16. Ensure that the agroecological systems are more resilient to climate change and request that resources are set aside for the development of agroecology, as part of climate policies that guarantee food sovereignty for the people.
17. Create mechanisms to promote South-South cooperation regarding the topic of agroecology, in collaboration with FAO, REAF, and other international and sub-regional organizations.

We wish to thank the organizing committee of this event, especially the Alliance of the People for Food Sovereignty in Latin America and the Caribbean, the FAO, CELAC, REAF, and the government of Brazil for their efforts to hold this discussion and we appreciate the efforts of FAO in carrying out the regional seminar in Africa and Asia. We request that the participation of those from social movements, governments, and the academic sector in Latin America and the Caribbean is included.

We also applaud the initiative of CELAC in carrying out a second seminar on agroecology during the pro tempore presidency, with support from FAO and REAF.

We would like to inform you that Nicaragua and Costa Rica intend to hold seminars in the region and ask for FAO´s support.

II Regional Seminar on Agroecology in Latin America and the Caribbean

LA PAZ, THE PLURINATIONAL STATE OF BOLIVIA, 27–28 SEPTEMBER 2016

Final declaration

In Latin America and the Caribbean, agroecology has been for decades a way of life for many farmers, smallholders, artisanal fishermen, pastoralists, gatherers, indigenous peoples, afro-descendants and traditional peoples and communities.

Agroecology has been promoted and claimed by social movements as a model of harmonious agriculture that respects the environment, biodiversity and ecosystems. It is considered sustainable from the social, environmental and economic dimensions. It has had the contribution of the academia, giving it a scientific basis, and in recent years, it has been assumed by some governments with the formulation of public policies which promote it and visualize its important contribution to food sovereignty, to food and nutrition security and to the sustainable management of natural resources and ecosystems.

Contributing to the CELAC Plan for Food Security, Nutrition and Eradication of Hunger 2025, to the SDGs, and in line with the commitments assumed by the States in the II Ministerial Meeting of Family Farming of CELAC, held in San Jose, Costa Rica, in November 2015, where the Ministerial Declaration on Family Farming and the 2016 Action Plan of the Ad-hoc Family Farming Working Group were approved and ratified at the Summit of Heads of State held in January 2016 in Quito, Ecuador. FAO, in collaboration with the Specialized Meeting on Family Farming (REAF) of the South American Common Market (MERCOSUR), the Alliance for the Sovereignty of the Peoples of Latin America and the Caribbean and the Government of the Plurinational State of Bolivia, have carried out the II Regional Seminar on Agroecology in Latin America and the Caribbean, in La Paz, the Plurinational State of Bolivia on 27–28 September 2016.

Taking into consideration the recommendations of the I Seminar on Agroecology of Latin America and the Caribbean, held in Brasilia - Brazil in June 2015 and the work done in the present meeting, the participants representing social movements, indigenous peoples, afro-descendants and traditional peoples and communities, academia, the business sector, governments, parliamentarians and FAO, commit themselves and invite others actors in the region, -in particular organizations such as CELAC, MERCOSUR, the Central American Integration System (SICA) and the Caribbean Community (CARICOM) to:

1. Recognize the role of agroecology and its multidimensional role in the paradigm shift towards a more sustainable and resilient agri-food system, contributing to the sovereignty and food and nutrition security peoples, to biodiversity and the sustainable management of ecosystems, to rural territorial development and the empowerment of communities.
2. Make artisanal fishing visible as an essential part of family farming and agroecology.
3. Make agroecological urban and peri-urban agriculture visible, along with its contribution to sustainable food and nutrition sovereignty and security.
4. Formulate, agree, implement and evaluate policies, legal frameworks, plans and programs to promote agroecology from and for the territories, with adequate budget for their execution, especially in the transition phase.
5. Guarantee and expand the participation of civil society organizations and movements, indigenous peoples, afro-descendants and traditional peoples and communities, youth and women in spaces for dialogue on public policies linked to agroecology.
6. Establish regional policy guidelines for the promotion of agroecology.
7. Promote the articulation and inter-institutionality of actions focused on the promotion of agroecology, involving public, social and private actors related to the areas of health, nutrition, education, finance, urban and rural planning, among others.
8. Expand the generation and management of knowledge and information based on evidence on agroecology, integrating scientific knowledge with the ancestral knowledge of indigenous peoples and practices developed by family farmers.

9. Generate, collect and systematize basic information on agroecology that reflects the multi-functional importance of the sector (including territorial social processes, biodiversity, local markets, nutrition and healthy diets) in contribution to decision-making.
10. Provide support and guidance to schools, institutes, universities to include and strengthen formal and non-formal education in agroecology.
11. Sensitize and educate consumers, promote the responsible and healthy consumption of products from agroecology.
12. Develop mechanisms that promote linkages between producers and consumers of agroecological products through the generation of short marketing systems such as local markets and fairs. Likewise, promote institutional mechanisms (such as institutional procurement and participatory guarantee systems among others) aimed at strengthening agroecological production and marketing.
13. Guarantee the rights to seeds, water, land and territories of indigenous peoples, native peoples, peasants, afro-descendants and traditional peoples and communities, artisanal fishermen.
14. Promote agroecology based on human rights, in accordance with the main treaties and international agreements, valuing life and respecting the diversity of opinions, in line with the international declaration of peasants and family farmers.
15. Conduct the III Regional Seminar on Agroecology of Latin America and the Caribbean in place and date to be determined.
16. Propose the celebration of the International Year of Agroecology.

Based on these agreements, a regional work agenda has been elaborated and agreed upon by the actors represented at the event and others who wish to join. Furthermore, it is expected that the commitment assumed at this meeting will allow the development of the agenda and that progress will be reported in the third seminary on agroecology.

Regional Work Agenda

1. Governance for the construction and implementation of public policies on agroecology

   1.1 Give visibility of agroecology's agenda in the areas of regional integration and existing public policy-dialogues such as the Family Farming Working Group of CELAC, the MERCOSUR Family Farming Specialized Meeting (REAF), the Family Farming Commission of Central American and Dominican Republic of SICA and the Caribbean Community (CARICOM).

   1.2 Strengthen and / or generate inclusive governance mechanisms and national intersectoral instances that engage different ministries, the private sector, social movements, indigenous peoples, afro-descendants and traditional peoples and communities, academia and international organizations for the discussion, formulation and implementation of public policies that favor agroecology.

   1.3 Strengthen the incidence in executive and legislative bodies, highlighting the work with the Parliamentary Fronts against Hunger.

1.4 Guarantee the inclusion of international agreements and declarations related to indigenous peoples, afrodescendants and traditional peoples and communities.

1.5 Prepare studies that collect and analyze information on public policies and legal frameworks in the region.

1.6 Strengthen public and private rural extension systems by promoting capacity building for agroecology among transition extension agents.

1.7 Generate financial mechanisms to support the agroecological transition, such as subsidies and production insurances.

1.8 Generate soft credit-lines for agroecological producer organizations.

1.9 Guarantee the creation and maintenance of public banks of native seeds.

2. Information generation, knowledge management and capacity development on agroecology

2.1 Prepare a discussion document that organizes the contemporary debate on agroecology allowing an epistemological, theoretical and methodological reflection.

2.2 Establish a joint program of research between FAO, academia, social movements, family farmers and indigenous people focused on generating data and evidence-based evidence, to be used for the development of policies that favor agroecological transitions.

2.3 Promote research-action and co-production processes in agroecology through the inter-scientific dialogue, in politically relevant policies, with an indigenous and family farming base.

2.4 Strengthen virtual platforms at regional level with statistical information, methodologies and systematization of farmers' experiences that favor the exchange of knowledge and decision-making, including FAO's global knowledge platform on agroecology and FAO's Knowledge Platform on Family Farming (agroecology section).

2.5 Promote the creation of a regional agroecology network with the participation of representatives from all sectors.

2.6 Strengthen transdisciplinary agroecological education in undergraduate and postgraduate programs in universities, training and research centers.

2.7 Strengthen non-formal agroecology schools, valuing popular peasant methodologies and promoting links between students and indigenous and peasant communities.

2.8 Promote the systematization, the exchange of experiences and the dialogue on ancestral and peasant knowledge.

2.9 Promote research on the role of agroecology as a mitigation strategy for climate change' impact.

3. Promotion of markets that stimulate and favor agroecological production and consumption

3.1 Promote short commercialization circuits such as fairs, local markets and government procurement programs for agroecological family farming products.

3.2 Make visible and socialize the existing experiences of solidarity economy and fair trade.

3.3 Generate market-information mechanisms.

3.4 Adapt the mechanisms of agroecological production certification to the reality of family farming.

3.5 Strengthen participatory guarantee systems (SPG), to expand the supply and consumption of agroecological products.

3.6 Generate awareness-campaigns and promotion of healthy agroecological foods.

3.7 Generate spaces for education and consumer awareness.

4. Rescue and valorization of agri-food systems with territorial identity

4.1 Generate a participatory process for the definition and recognition of agroecological production areas.

4.2 Strengthen institutional capacities of territorial organizations that contribute to sustainable rural territorial development.

4.3 Strengthen the mechanisms of access to land, water and other productive resources for agroecological producers.

4.4 Create and develop laboratories and / or bio-factories to guarantee the availability and access to agroecological inputs in the territories.

SUB-SAHARAN AFRICA

Recommendations of Regional Meeting on Agroecology in sub-Saharan Africa

DAKAR, SENEGAL, 5–6 NOVEMBER 2015

Background

FAO organized on 18-19 September 2014 in Rome, the International Symposium on Agroecology for Food Security and Nutrition. The successful Symposium brought together 400 scientists, food producers, policy makers, farmers' organizations, the private sector and NGO representatives. During this Symposium FAO's Director-General announced that FAO would thereafter organize regional meetings on Agroecology in Latin America, Africa and Asia, to discuss this issue further and would incorporate agroecological approaches in its on-going work.

In February, 2015 representatives of producers' organizations and social movements met at the Nyéleni Training Centre in Sélingue, Mali and produced the Nyeleni Declaration on Agroecology outlining the civil society's view on Agroecology.

The Regional Meeting on Agroecology in sub-Saharan Africa

On 5–6 November 2015 over 300 representatives from governments, civil society, research and the private sector have participated in the Regional Meeting on Agroecology in sub-Saharan Africa hosted by the Government of Senegal and co-organized by the Government of Senegal and FAO in Dakar with the opening ceremony presided by the Senegalese Minister of Agriculture and Rural Facilities. The meeting builds on FAO's International Symposium on Agroecology for Food Security & Nutrition that took place in September 2014 and FAO's Regional Meeting on Agroecology in Latin America and the Caribbean.

The commitment of African governments to sustainable rural development and to increasing their investments in agriculture so to enhance the livelihoods and well-being of rural populations also reflects a momentum in which Agroecology has a role to play.

Agroecology, stressing adaptation of agriculture to natural conditions and cycles, as well as to local needs – has been carried out by African farmers and pastoralists for millennia. Thus, while often not explicitly termed "Agroecology", many actors and initiatives exist within sub-Saharan Africa that builds on agroecological principles.

Agroecology's holistic approach - incorporating the traditional knowledge and skills of the world's farming communities with cutting edge ecological, agronomic, economic, and sociological research, has the potential to support strong, democratically-based food systems that provide health and livelihood to small-scale, family farmers, rural communities; as well as environmental benefits.

During this meeting, agroecological initiatives and practices have been recognized as achieving sustainable agriculture and development while reducing rural poverty, hunger and malnutrition and increasing climate resilience of agriculture. Agroecology also provides perspectives for rural youths and can help slow the rural exodus currently occurring in sub-Saharan Africa.

Recommendations

During our deliberations in four round tables on the following themes:

1. Agroecology as a Path to Food and Nutrition Security for the Agricultural Transition in Africa.
2. Public Policies (including Legal and Institutional Frameworks) to Promote Agroecology.
3. Agroecology: Social Innovation, Livelihoods and Technology.
4. Public Policies (including Legal and Institutional Frameworks) to Promote Agroecology.

Speakers and participants from governments, civil society, research and the private sector have identified the following recommendations on Agroecology in sub-Saharan Africa:

Governments and policy makers, donors and technical partners, with the support of intergovernmental organizations, particularly FAO, should:

1. Ensure producers', especially women's, youth's and indigenous peoples' access to natural resources, notably land, water and biodiversity by developing simple procedures for the

acquisition, registration and securing of land tenure. In this context, the "Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests" should be implemented.

2. Mainstream agroecology into regional and national agricultural policies and programs including into regional economic communities and incorporating fisheries, forestry and livestock into CAADP. CAADP should develop an innovation platform on agroecology.
3. Create platforms to collect and exchange agroecological experiences and innovations across the African continent and on national levels.
4. Put in place tools that allow, among others, to review and transform current agricultural subsidy systems as well as trade and investment policies towards agroecology and adequately finance policies and laws promoting Agroecology, especially to fund agroecology research.
5. Launch pilot projects at territorial level such as the creation of agroecological territories.
6. Develop and implement public procurement policies that favour agroecological and local food production as well as intensifying South-South cooperation on agroecology.
7. Integrate agroecology in national research systems and in the curricula of higher education institutions, at the level of pedagogic programmes in training centres for producers both formal and informal, including farmer field schools, school farms, farmers' trainings and school gardens.
8. Put in place and fund an African fund for the development of agroecology.
9. Integrate knowledge of agricultural practices in natural conditions into education to catalyze the role of Agroecology in economic process.
10. Promote the development of seeds systems that address availability, access and ownership issues, including community seed systems, indigenous knowledge, extension services.
11. Raise awareness about the nutritional value of agroecological products.
12. Protect the diversity of local peasant seeds against any negative external influence.
13. Incentivize local private sector actors to embrace agroecological principles.
14. Formulate responsive national plans that will strengthen land use systems that promote and sustain agroecology.
15. Develop agroecology independently of Climate Smart Agriculture and propose to COP21 that an international protocol for agroecology be put into place and adopted by national governments.

Academia and the research community should:

16. Strengthen existing local knowledge, farmer-led research as well as farmers research networks with a focus on the co-creation of knowledge and participative research.
17. Build and strengthen the evidence base for Agroecology, collect, and better disseminate data on Agroecology to enable evidence-based decision making.

18. Invest more in applied agroecological research with a focus on selecting varieties and breeds directly on-farm, as well as on social and human sciences applied to agroecology.
19. Identify species, including livestock and trees, adapted to climate change.

Civil Society Organizations should:

20. Develop networks and mobilize stakeholders to create solidarity based economies that foster agroecology.
21. Encourage producers and civil society organizations to continue to promote agroecological practices on the community level in rural and peri-urban areas.

Institution at all levels, communities and sectors should:

22. Promote farmer-led, bottom-up, local innovation systems and practices to enhance the fundamental role of agroecology in biodiversity conservation and to strengthen the dissemination of innovations.
23. Take value chains and market development into account in innovations in order to make agroecology more attractive, especially to youth.

> We recommend the government of Senegal and the FAO Regional Office for Africa to inform at the forthcoming FAO Regional Conference for Africa about these recommendations.
> We invite organizations to commit to implement one or more of these recommendations.
> We invite participants to commit to integrate these recommendations in their organizations

ASIA AND THE PACIFIC

Recommendations of participants to the Multistakeholder consultation on Agroecology in Asia and the Pacific

BANGKOK, THAILAND, 24–26 NOVEMBER 2015

Context

FAO organized on 18–19 September 2014 in Rome a Symposium on Agroecology for Food Security and Nutrition. This Symposium, which was considered a great success, gathered 400 scientists, producers, decision-makers and representatives of the private sector, the public sector and NGOs. On occasion of the Symposium, the Director-General of FAO, José Graziano da Silva, announced that FAO would organize regional meetings on Agroecology in Latin America, Africa and Asia. This reflects one of the learnings of the International Symposium, namely that the implementation of agroecology, to be effective, must be based on regional and local realities and on the specificity of economic, social and environmental contexts.

In February 2015 the representatives of small-scale food producers and civil society gathered at the Nyéléni Centre in Sélingué and agreed on the Nyéléni declaration on Agroecology explaining the points of view of civil society on agroecology.

The regional meeting on Agroecology in Asia

From 24–26 November 2015, over 150 participants representing governments, civil society, including peasants, fisherfolks, pastoralists, urban communities, indigenous peoples, women's organizations and youth, academia and private sector gathered in Bangkok for the multistakeholder consultation on Agroecology in Asia and the Pacific organized by FAO. This meeting is based as a follow-up to the International Symposium on Agroecology for Food Security and Nutrition which was held in September 2014.

Agroecology, which is based on the adaptation of agriculture to local conditions, natural cycles and needs, is not new to the Asia – Pacific region and has been practiced by Asian small-scale food producers across the region, including peasants, fisherfolk, pastoralists, urban communities, indigenous peoples, women's organizations, youth and others, are nourishing and maintaining communities through agroecology. Although they do not systematically use the term agroecology explicitly, many actors and initiatives throughout Asia and the Pacific are based on agroecological principles, which include the protection of natural habitats. There are many ecological zones and societal diversity within this region resulting in unique agroecological approaches.

During this meeting, participants highlighted the many agroecological initiatives and practices which play a role on a number of different aspects including reduction of rural poverty, eradication of hunger and malnutrition, promotion of sustainable agricultural development, improving soil fertility, improvement of resilience of agriculture to climate change all of which are central to achieve the Sustainable Development Goals. Agroecology also provides prospective employment for rural youth and, addressing different livelihoods related to agriculture, can contribute to stop the enduring rural exodus in Asia and the Pacific. Despite evidence of agroecology's benefits, many public policies are not supportive to Agroecology.

Crucial elements that are common across different agroecological approaches are:

- Agroecology is an integrated and holistic approach rooted in and arising from local community and cultural practice at the territorial level.
- Autonomy is a pillar of Agroecology.
- It contains innate capacity for adaptation and resilience to climate change, natural disasters, economic, environmental and other shocks.
- It is founded on a rights based approach.
- Women's knowledge, values, vision and leadership are central to Agroecology.

Recommendations

During our discussions in seven sessions and two pre-meetings around the following subjects:

1. Farmers' Fields Schools (FFS) and Agroecology.
2. Agroecology Knowledge Platforms and Farmer-Researcher Networks.

3. Overview of agroecological systems in Asia and the Pacific and examples of Agroecology approaches diversity in the region.
4. Agroecology and natural resources in the context of climate change.
5. Agroecology learning processes, knowledge sharing and building agroecological movements;
6. Making markets works for Agroecology.
7. Agroecological transitions in Asia for Food and Nutrition security, initiatives and policies to scale up Agroecology.
8. Synthesis of the key points of the discussion and recommendations.
9. Multi-stakeholder discussion panel: outcome and way forward.

The participants of this meeting, representatives of governments, civil society, including peasants, fisherfolks, pastoralists, urban communities, indigenous peoples, women's organizations, youth and others, academia, and private sector issued the following recommendations for the development of agroecology in Asia and the Pacific:

Governments, decision-makers, technical and financial partners, with the support of intergovernmental organizations in particular FAO, should:

1. Ensure, recognize, respect and uphold small-scale food producers' and communities', in particular women's, youths' and indigenous peoples', rights to land, water, seeds, oceans, forests, commons, biodiversity and territory, also considering the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests and the Voluntary Guidelines for Securing Sustainable Small-scale fisheries and the final declaration of the International Conference on Agrarian Reform and Rural Development.
2. Make Agroecology an integral part of sub-national, national and regional agricultural policies and develop and implement appropriate legal and regulatory frameworks that will be implemented. Planning, design and formulation of policy for agroecology should be increasingly carried out inclusively, respecting the principle of free, prior and informed consent, in a collaboration between policy makers, scientists, educators, UN, development partners, CSOs, in villages in the field, listening to and learning from local communities and prioritizing resource-poor environments such as uplands, rain-fed, arid, and degraded areas.
3. Consider the real environmental costs and externalities of existing practices and policies. Ensure policy coherence, such that policies that hinder agroecology and the transition toward agroecology are revised.
4. Prioritize investments in smallholder food producers, reorient markets to make them work for small-scale food producers, including to strengthen and where needed creation of local markets and developing and implementing institutional food procurement policies oriented towards agroecological and local products.
5. Create, in collaboration with all relevant stakeholders, platforms for the collection and the exchange of agroecological experiences and innovations, environmental monitoring, as well as funding at the level of the Asia and Pacific region as well as at national levels.

6. Create a cross-cutting and intercultural education strategy as well as national training centres and dedicated certificates and degrees on Agroecology. This should enhance the skills of farmers to better understand and use markets for income and expanded opportunities including through Community Supported Agriculture, organized cooperatives, and better use of social media and other ICT innovations.
7. Integrate agroecology in the curricula of both formal and nonformal primary and higher education institutions, in vocational training centres for producers, including farmer field schools, school farms, farmers' trainings and school gardens. This should recognize and value the important Agroecology work ongoing in government and civil society and social movement Farmer Field Schools, and build on that foundation to further develop, strengthen and upscale Agroecology. The content of the above should be derived from the knowledge generated by small-scale food producers themselves.
8. Increase funding for agroecological projects, programmes and launch pilot projects such as the creation of agroecological territories at community, collective levels, integrating the different dimensions of communities - social, economic, political, environmental and cultural.
9. Preserve and expand the rights of small-scale food producers over local genetic resources and biodiversity: seeds, livestock breeds, fish species, plant varieties, knowledge, manure and feeds.. Support and revive traditional management practices, local rice varieties and other staple food varieties and neglected and underutilized as well as drought-resistant crops through for example, peasant seeds houses and networks and protect genetic materials, knowledge and innovations of small-scale food producers against any negative external influence.

Civil Society Organizations should:

10. Develop and reinforce partnerships with FAO on Agroecology, specifically on data gathering, case studies and advocacy.
11. Farmer field schools should evolve, transform and increase their attention to livestock, fish, and their associated pastoral ecosystems in their curriculum and policy advocacy.

Institutions at all levels, including the academic and research community, all communities and sectors should:

12. Build a regional network of agroecology researchers, involving CSOs and small-scale food producers and allow for learning from each other across countries, contributing to achieving recommendations 13-16.
13. Recognize that research always entails ethical decisions and that farmers are co-researchers and innovators.
14. Devote more means to research on agroecology and climate change with an emphasis on the selection of varieties and species directly at farm level, as well as on social and human sciences applied to agroecology.

15. Recognize, support and document producers' knowledge. For this, a new research and extension paradigm is necessary, that includes participatory action research, the co-production of oral and written knowledge and cultural practices. All agroecology educational interventions should address the needs of communities inclusively, considering the particular needs of women, indigenous peoples, vulnerable groups, and youth.
16. Compile and share data with small-scale food producers, policy makers, consumers, in a participatory manner, to make strong public policies to support agroecology. Data should include for example: percentage of production from agroecology, market-related data, effects of agroecological approaches on climate change resilience, price levels and setting, nomadic (and livestock) migratory routes and fish migration patterns as well as historical practices of exchange of products and traditional amongst various small-scale food producers among others.
17. Promote systems and practices of social innovation led by farmers in a bottom-up fashion to improve the fundamental role of agroecology in the conservation of biodiversity and dissemination of innovations.

> We recommend the FAO Regional Office for Asia and the Pacific to inform the upcoming 33rd Regional Conference for Asia and the Pacific of these recommendations and discussions to promote agroecology in national policies and programmess and to propose to better promote agroecology in its ongoing regional programmes and initiatives, such as the agroecosystem-based Regional Rice Initiative, the Zero Hunger Initiative, the Blue Growth Initiative, and to set up a new regional initiative on agroecology that includes also a monitoring system of all activities of FAO and governments in the region on Agroecology.

CHINA

Recommendations of the International Symposium on Agroecology for Sustainable Agriculture and Food Systems in China

KUNMING, YUNNAN, CHINA, 29–31 AUGUST 2016

Background

FAO organized the International Symposium on Agroecology for Food Security and Nutrition in 2014 and three regional symposia throughout 2015. Building on the recommendations of these symposia, a multi-stakeholder International Symposium on Agroecology for Sustainable Agriculture and Food Systems was organized by the Chinese Academy of Agricultural Sciences (CAAS) and FAO in Kunming, China, 29-31 August 2016.

The Symposium, hosted by the Yunnan Academy of Agricultural Science with support from the government of Yunnan province, was participated by over 230 participants representing research, government, civil society (including farmers organisations, consumer organisations and NGOs), Indigenous Peoples, and the private sector from China and over 20 countries from the region and beyond.

The Symposium was held in the context of global challenges and the new developments, especially the UN 2030 Agenda and the Sustainable Development Goals (SDGs) and the Paris Agreement on Climate Change. Elimination of hunger, malnutrition and poverty is at the heart of achieving the SDGs at the local, national and global levels. Agroecology advocates innovative solutions to the 21st century challenges, and a holistic and systematic approach towards achieving the SDGs in the face of climate change, to build sustainable food systems that produce more with less environmental, economic and social costs, with a particular focus of benefiting family farmers.

China as the largest agricultural country in the world has an over 5 000-year history of farming traditions and ecologically based farming practices by small-holder farmers. The country is now at a critical point of "transition of agricultural development mode", to reform its agriculture sector through structural adjustment with the dual goal of ensuring domestic food supply and promoting ecological sustainability. Since 2010, the government has launched a series of policy guidelines and strategic programs, underpinned by a wide scope and in-depth research as well as increasing engagement of the civil society, towards sustainable agricultural development and the construction of "ecological civilization".

The Symposium largely achieved its original objectives of facilitating exchange of knowledge and experiences, identifying and defining potential entry points and contribution of agroecology to sustainable agriculture and food systems in China and the region, and catalyzing international collaboration to develop ways forward for strengthening agroecological practices and programs.

Participants of the Symposium agreed to the following recommendations.

Beyond productivity: multiple criteria for assessing performance of agricultural systems

1. Take human development factors and social dimensions into account in farming/food system analysis and policy development, with a special focus on gender fairness and local empowerment.
2. Identify and develop indicators on environmental, social, cultural, and economic dimensions of agroecology at different spatial scales (farm, society, national level) and gather data on agroecology, including at the very long term. FAO should establish a working group to contribute to this task.
3. Apply frameworks that allow better understanding of the transition to agroecological systems, such as the five levels, from improving efficiency through to agroecosystem diversification, innovative markets and policies.

Promising policies in support of agroecological transitions

4. Promote public policies which support agroecology, especially those based on long-term processes, assuring the necessary financial mechanisms for their implementation, such as support for climate change mitigation and adaptation and taxation for pollution.
5. Prioritise the monitoring of the impacts of existing public policies for agroecology in various countries towards sustainable agriculture and food systems. Experiences on the impact of policies on agroecology should be shared among countries. FAO should collect information on existing policies on agroecology in Asia, to be included in the FAO Agroecology Knowledge Hub.
6. Promote the participation of farmers and other small-scale producers[23] in policy formulation and decision making at all levels. Public policies and legal frameworks should be more adapted to local situations.
7. Ensure policy coherence, such that policies that hinder the transition toward agroecology are revised. Different ministries should cooperate to support policies for agroecology, for example environment, agriculture, forestry, rural development, health, trade, finance, etc.
8. FAO should sustain its support for agroeocology, including through integrating agroecological approaches in regional and national priorities.

Biodiversity as an integral part of agroecology

9. Value and strengthen the roles and contributions of pollinators, trees, beneficial organisms and microorganisms to agroecosystems, human nutrition, health and well-being.
10. Recognize the essential role of farmer seed systems and strengthen their contributions to agroecology.

Closing cycles and nutrient flows

11. Increase efforts to develop innovative technologies and multi-stakeholder strategies that reduce waste and pollution at source and close relevant ecological cycles, with special focus on water, nutrients, manure, energy and long-term effects.
12. Develop research and monitoring from farm to landscape scales to understand the factors causing the difficulties in disseminating the developed technologies.
13. Conduct research for comprehensive understanding of complex problems caused by nutrient flows in food systems.

[23] The term 'small-scale producers' refers to artisanal fisherfolk, pastoralists, indigenous peoples and forest-dwellers.

Managing agroecological landscapes

14. Support the communities who manage landscape arrangements to apply their local and traditional knowledge for successful agroecological innovations to retain ground cover, biodiversity and resources.
15. Minimise off-site effects on air, water and land quality caused by run-off, erosion, leaching, percolation, and eutrophication at landscape (farm, watershed, continent, globe) scale.
16. Recognize and make good use of the functional differences along a watershed across these landscape levels.
17. Support adaptation to climate change, such as altered landscape temperature and water profiles, which could include adapting technologies to new locations.

Local innovation systems

18. Value the importance of the continual process of experimentation and innovation that goes on, and has gone on for generations, in local, traditional, small-holder agriculture around the world.
19. Value the important role of the farmer field school approach in knowledge generation and learning about agroecological concepts and good practices for improving productivity and rural livelihoods.
20. Support the linkage of academics, small-holder farmers, and indigenous peoples in the research that focuses on the transdisciplinary development of new knowledge and innovation.
21. Globally Important Agricultural Heritage Systems, with their special designation, should not just be conserved, but used as centres of how agroecology and culture work together and innovation can occur.
22. Develop a broad network or platform of agroecology case studies from around the world of small-holder, local, traditional, and indigenous agriculture and food systems for the sharing and exchange of knowledge.

The role of farmer organisations and civil society in agroecological transitions

23. Agroecology should support the culture, way of life and dignity of family farmers. Governments should recognize the key role of farmer organizations and other small-scale producers and civil society in the development of agroecology, dissemination of agroecological innovations and advocacy for supporting policies.
24. Governments should implement farmers' and indigenous people's rights under the International Treaty on Plant Genetic Resources for Food and Agriculture, the UN Declaration on the Rights of Indigenous Peoples and other international agreements and instruments.
25. Support internship programs for students to work with farmer groups and cooperatives, with opportunities for longer term employment in extension or other agricultural services.

Innovative markets for agroecology

26. Policy-makers should recognize and support existing and emerging equitable markets and networks that connect producers and consumers.

27. Promote institutional innovations that build mutual trust and benefits. FAO could facilitate international platforms of these innovations so as to foster learning and expand the reach of agroecology.

28. Promote public procurement from agroecological producers by adapting the procurement protocols to the local realities of agroecological production (e.g., informal trading relations).

29. Create spaces for agroecology by providing public facilities that can be used to host farmers' markets, fairs and festivals etc.

30. Analyse policies and build capacity to facilitate producers' ability to exchange their products on their own terms.

31. Collect data, via participatory methods, on the full range of markets for agroecology and produce analyses that can be used by producers, consumers, researchers and policy-makers.

EUROPE AND CENTRAL ASIA

Recommendations of the Regional Symposium on Agroecology for Sustainable Agriculture and Food Systems in Europe and Central Asia

BUDAPEST, HUNGARY, 23–25 NOVEMBER 2016

Background

Agroecology is based on principles such as biomass recycling, circular system of food production, soil health and preservation, natural inputs (sun radiation, air, water and nutrients) optimization, loss minimization, conserve biological and genetic diversity and enforcement of biological interactions in agroecosystem components. It relies on a localised value chain, locally-available natural resources and knowledge, with a strong focus on participatory action research to achieve context-specific and socially-accepted innovations within farming systems. It is multi-disciplinary, drawing on agronomy, ecology, economy and social sciences and therefore developing agroecological programmes and policies requires a multistakeholder approach bringing together agriculture, environment and social perspectives. Agroecology can make an important contribution to the transition to more sustainable food systems. Its practices, research and policies have seen exponential growth worldwide in the last decade.

Recognizing the role that agroecology can play in achieving food security and reducing malnutrition in the framework of Sustainable Food and Agriculture, FAO organized the International Symposium on Agroecology for Food Security and Nutrition in Rome in September 2014. Following this International symposium, FAO has taken the initiative of convening multi-stakeholder Symposia at the regional level[24].

These regional symposia focused on disseminating the key messages from the global symposium, collecting and exchanging scientific and practical knowledge and successful cases of applying agroecology at the local and regional levels, and on identifying needs for policy, capacity development and enabling environment for the promotion and application of agroecology and provided a set of recommendations.

The Regional Symposium on Agroecology for Europe and Central Asia

On 23-25 November 2016 more than 180 participants from 41 countries representing governments, civil society, research and the private sector have attended in the Regional Meeting on Agroecology in Europe and Central Asia hosted by the Government of Hungary and sponsored by the Government of France. The meeting was jointly organized by the Government of Hungary and FAO.

The Symposium was opened by H.E. Sándor Fazekas, Minister of Agriculture of Hungary, H.E. José Graziano Da Silva, Director-General of FAO, H.E. Serge Tomasi Ambassador, Permanent

[24] Latin America and the Caribbean Seminar, June 2015 Brasilia, Brazil and September 2016 La Paz, the Plurinational State of Bolivia; Asia and the Pacific Seminar, November 2015, Bangkok, Thailand; and Kunming China August 2016; Sub-Saharan Africa Seminar, November 2015, Dakar, Senegal

Representative of France to the UN Agencies for Food and Agriculture in Rome and Aldo Longo, Director for General Aspects of Rural Development and Research, DG Agriculture and Rural Development of the European Commission. This High level segment insisted on the importance on shifting current systems towards more sustainable food and agricultural systems.

H.E. Sándor Fazekas, Minister of Agriculture of Hungary stated:

> "Agroecology is a prerequisite for sustainable agriculture, protection of biodiversity, sustainable natural resource management and supporting rural development. Agroecology can contribute to the achievement of Sustainable Development Goals and will lead us to solutions for the most urgent global challenges of our time. All that we are aiming for can be achieved together if we cooperate and align our actions, including member state governments, civil society actors, private sector, academia and research institutes. Countries in our region could certainly benefit from the development of agroecology."

H.E. José Graziano Da Silva, Director-General of FAO highlighted the importance of exploring the transformative potential of agroecology:

> "Business as usual is not an option. We have to innovate and transform agriculture. We need to be more productive using less resources. We need to generate less environmental impact. And we have to go beyond sustainable intensification. Increasing the efficiency of farming (with precision input, improved seeds and other techniques) is certainly important. But it is not enough to reduce the environmental footprint of agriculture. In many parts of the world, the demand for agricultural products is still growing rapidly. New areas are still being cleared for agriculture at record rates, even with successful intensification. Current techniques are reducing damage only at the margins. To tackle this situation we need better coordination on farm and non-farm resource management. And we need an integrated approach that agroecology can offer. FAO is committed to explore all the potential of agroecology in this regard."

Speakers and participants from governments, civil society, research and the private sector have identified the following key propositions to develop Agroecology Europe and Central Asian brought up the key concepts and Challenge of agroecology in Europe in Central Asia, debated within six modules:

1. Concepts and challenges of agroecology.
2. Agroecological systems and practices.
3. Research, innovation and knowledge sharing for agroecological transitions.
4. Agroecology at the core of ecosystem services-ecological and social challenges.
5. Valuing agroecology and sustainable food systems.
6. Transformative policies and processes.

The participants of the Symposium endorsed the following recommendations.

Public policies to develop agroecology and promote transition

1. Develop scientific and citizen led data supporting the potential of agroecology to create jobs and the need to analyse and systematise the experiences so to measure (quantify and qualify) the social, ecologic and economic implications of agroecology both at the farm scale and for upstream and downstream jobs.
2. Improve and develop a policy and economic framework within agricultural policies that supports and allows farmers to implement agroecological practices and make the transition to agroecological farming systems in the Common Agricultural Policy (CAP) and in other food and agricultural related policies and programs throughout the Region. Direct payments should be made depended upon protecting and enhancing biodiversity.
3. Promote the establishment of Food Policy Councils at local, regional and national level to foster and allow consumers and food producers participation in decision making processes around the food system, markets and trade.
4. Improve knowledge and evidence base for the needed policy, incentives, market regulatory mechanisms, tariffs to create the needed enabling environment to allow the transition to agroecology.
5. FAO should include agroecology in its work done in collaboration with the International Labour Organisation (ILO) to ensure decent rural employment opportunities that ensure a living wage, security in the workplace, access to social protection and respect for fundamental human rights.
6. Develop and collaborate with international mechanisms recognising collective peasant rights, such as the Declaration on the Rights of Peasants and other People Working in Rural Areas, currently negotiated in the United Nations Human Rights Council.
7. Enhance the role of agroecology in sensitive regions, specifically in Central Asia, to sustainable management of natural resources in the context of climate change to create awareness among different stakeholders (policy makers, researchers, private sector, farmers, Civil Society Organizations, and individuals).
8. Promote research in order to better identify, quantify and qualify those policies that disincentives agroecology. Making sure that True Costing work informs all relevant decisions that impact directly or indirectly agriculture and food systems.
9. Encourage the region to identify flagship countries piloting agroecology and allowing for the multi stakeholder development of knowledge and the adoption of agroecology principles.

Agroecology and sustainable food systems

10. Extend the dialog between health, nutrition, ecology, trade and agriculture actors to support the development of agroecological sustainable and healthy food systems.
11. Facilitate a shift from linear food systems to circular ones that mimic natural cycles and reduce carbon and ecological footprints of food and agriculture, - ensuring that circular systems are designed to replace specialised and centralised supply chains with resilient and decentralised webs of food and energy systems that are integrated with sustainable water and waste management systems.
12. Agroecology principles should be formulated and used as the principle guideline to transform and improve the current food system, be based on participation, alliances and put food producers at the centre.
13. Develop specific policies and programs to enhance public procurement based on short and local supply chain principles that provide fresh, nutritious, affordable food, which is produced in a sustainable manner and builds local and regional economies.
14. Develop public and long term financial measures, training and knowledge exchange in improving short supply chains which favour small-scale producers, such as direct marketing and value adding, peasant markets, micro-dairy, Community Supported Agriculture (CSA) initiatives and Participatory Guarantee System (PGS), give financial and infrastructure support for collective local food processing units and support sanitary rules for proximity markets which are adapted to the conditions of local markets.
15. Implement the policy recommendations on 'Connecting smallholders to markets' recently negotiated in the Committee on World Food Security at national level.

Agroecology and natural resources in a changing climate: water, land, biodiversity and territories

16. Promote policies, practices, research and awareness creation material to achieve the transformative potential of agroecology to address the urgency of adapting, mitigating and reversing climate change.
17. Contribute to the agroecological transition through territorial approaches and organize pilot farm network acting according to the principles and methods of agroecology and sharing their practices and techniques.
18. Ensure, recognize, respect and uphold small-scale food producers, family farmers and communities', in particular women's, youths' and indigenous and nomadic peoples', rights to land, water, seeds, inland and coastal waters, forests, commons, biodiversity and territory, also promoting the implementation of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests (VGGT) and the Voluntary Guidelines for Securing Sustainable Small-scale fisheries (VGSSF) and Farmers' Rights as stated in the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).

19. Close collaborate with the Commission on Genetic Resources and seek synergies with other relevant processes like Convention on Biodiversity
20. Develop national and regional plans for agroecological pathways to sustainable food systems and natural resource management that support the Sustainable Development Goals (SDGs) and the UNFCCC Paris Agreement.
21. Support the participative development of adequate criteria for assessing and valuing agroecological systems and sustainable food systems, and promote their widespread sharing among all actors.
22. Facilitate the development and implementation of agroecological practices also for aquaculture and fish pond systems based on agroecological principles and study options for better integrating aquaculture, pastoralism, livestock and crop systems within territories in order to recycle resources.
23. FAO should reinforce its processes and strengthen its partnerships to prioritize agroecology in the framework of its Strategic Framework especially in the relevant delivery mechanisms (MWAs, CPFs and RIs), and implement the recommendations from the Committee of Agriculture (COAG) and regional conferences and enhances activities especially linked to Climate Change and Biodiversity.

Research, innovation, knowledge sharing and agroecological movements

24. Knowledge transmission requires redesign educational programs to integrate agroecology in the curriculum of non-formal and formal education (in primary and higher education), following the principles of the Global Action Programme (GAP) on Education for Sustainable Development (ESD).
25. Support knowledge exchange in particular horizontal exchange between food producers (farmer to farmer and Farmer Field Schools (FFS) methods), adapting advisory services and extension services to agroecology with specific attention to climate change adaptation and mitigation.
26. Recognise, value, support and document ancestral knowledge and modern innovations, traditions, pastoralists and peasants' local wisdom. Include participatory action research, the co-production of oral and written knowledge and cultural practices that addresses the true needs of communities, and particularly considers the needs of women, indigenous peoples, vulnerable groups, and youth. Ensure that innovations and the products of research remain in the public and collective domains according to Article 9 in the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).
27. Develop mechanisms and bridges among different agroecology knowledge platforms and websites including the European Innovation Partnership Network and FAO.
28. Promote and support agroecological practices that reduce external inputs – specifically seeds, fertilizers, pesticides, animal feed and, fossil fuels enhancing the capacity of soil and agroecosystem health to close cycles and maintain productivity, stability and resilience.

29. Document impacts of agroecology on farm income, productivity and livelihoods of farmers and develop better data on the evidence base on externalities like social and environmental costs and benefits of agroecological systems, possibly including collaboration with the True Cost Accounting work.

30. Create awareness material on the concept of innovation to include conceptual, methodological, social and institutional in addition to technical innovations.

31. Strengthen public research: allocate more funds for public research in this field, favour interdisciplinary research better connecting agricultural, ecological and social sciences. Facilitate changes in research organisations (incentives and rewards, ways of working and the training of scientists and professionals) and enable farmers and citizens' participation in research including in their community and in governance of research: setting upstream research priorities, the allocation of funds, and participation in production of knowledge and in risk assessments.

32. Strengthen self-managed research: strengthen farmers and extension services networks for research and horizontal spread of agricultural innovations, strengthen the capacity of farmers and citizens to facilitate transdisciplinary innovations that bridge different knowledge systems and give farmers and citizens enough material security and paid time to engage in and participate in the whole research cycle, including in the evaluation of research programs and institutes.

33. Organic agriculture is largely rooted in agroecological approaches, both in principles and actual practices, and most of the organic farmers respond to an ecological mission as part of their social undertaking. We recommend that Agroecology and organic farming are considered in their synergies and co-evolution.

34. Participatory research and knowledge sharing require openness in the exchange of data. Preserving the public nature of knowledge and environmental data is required for the development of agroecology.

35. Develop nutrition sensitive interventions and for example design legume inclusive diversification of food and fodder cropping systems based on agroecological principles and practices to improve soil health as an agroecological contribution to Sustainable Development Goals (SDGs), especially to number 1, 2, 15 and 17.

36. Recognize and strengthen farmer seed and livestock systems and reinforce their contributions to agroecology.

37. Promote research on the institutional processes and governance of agroecology.

THE NEAR EAST AND NORTH AFRICA

Adapting to Climate Change in Semiarid Areas for a Sustainable Agricultural Development, Food Security and Nutrition: Consultation workshop on Agroecology

Way forward – Areas of action to strengthen agroecology in the Near East and North Africa

TUNIS, TUNISIA, 21–23 NOVEMBER 2017

The following areas of action resulted from the 3-day FAO consultation on agroecology in Near East and resulted from the inputs of the 60 participants representing governments, civil society, universities and research institutes, and UN bodies.

Awareness

1. Recognise the multiple benefits of agroecological systems (environmental, social, cultural, economic, etc.) and raise awareness about benefits and transitions to agroecology among all stakeholders, including through multimedia and local languages.

Agroecology in action

2. Support and enhance existing agroecological systems in the region (based on traditional farming, pastoralism and artisanal fisheries).
3. Develop pilot sites in all major agreocosystems of the region to show that agroecology works and to show how modern and traditional knowledge can be integrated to respond to new challenges.
4. Support the scaling up of existing successful experiences.

Markets

5. Strengthen markets for agroecology – especially at the local/national level.
6. Raise awareness about the health benefits of agroecological products among consumers.

Knowledge

7. Build innovative modern solutions based on the knowledge of agroecological producers (family farmers and pastoralists) enhanced with scientific knowledge.
8. Document traditional knowledge.
9. Support economic, social and ecological research.
10. Exchange experiences between countries on how to support transitions to agroecology.
11. Map capacities related to agroecology among different stakeholders in the region.

Youth

12. Support agroecology as a strategy to keep young people in rural areas by giving value to their role as agroecological producers.
13. Enhance inter-generational knowledge exchange.

Farmers, pastoralists and CSOs

14. Increase exchange of knowledge and experiences for family farmers and pastoralists inside the region, and with other regions.
15. Strengthen and enhance capacities of farmers' and pastoralists' organisations.
16. Strengthen their capacities in all aspects of agroecology (production, markets, etc.).

Policies

17. Move agroecology from the margins to the centre of agricultural policies and integrate it into existing policies.
18. Focus policies and investments for agroecology on family farmers and pastoralists (they are the ones practising agroecology today).
19. Support territorial approaches for policy integration to strengthen agroecological approaches, including through building on decentralisation processes in the region.
20. Establish national inter-ministerial committees to develop policies for agroecology.
21. Gather baseline data and monitor programmes and policies to show the impact of agroecology.
22. Explore options for financial support to incentivise agroecological farmers (rather than subsidising unsustainable agriculture).
23. Support national, sub-regional and regional strategies for agroecology transitions.
24. Support improved governance of transboundary ecosystems.
25. Establish a consortium of countries who have included agroecology in their Nationally Determined Contributions for UNFCCC (UN Framework Convention on Climate Change).

Agroecology has been gaining interest in recent years among governments, research and civil society organisations worldwide and many actors present it as a strategic pathway to transition to sustainable food and agriculture systems for achieving food security and nutrition. Following the 1st International Symposium on Agroecology for Food Security and Nutrition, held in Rome in 2014, FAO organized a series of regional multistakeholder seminars in Latin America and the Caribbean, sub-Saharan Africa, Asia and the Pacific, China, Europe and Central Asia, and the Near East and North Africa from 2015 to 2017. These seminars provided many opportunities for exchange and debate and revealed that while the scientific framework for agroecology dates back to the last century, it is a living concept that can be interpreted differently by different actors. The participants' testimonies showed not only the wealth of existing initiatives but also their high expectations about supporting agroecological transitions on a larger scale. This report presents a summary the main lessons learned from the regional meetings and drawing from this, proposes a framework for action to support the development of agroecology in the coming years. This is a direct contribution to the *2 nd International Symposium on Agroecology: Scaling up Agroecology to achieve the SDGs.*

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