Thematic Evaluation Series

Evaluation of FAO's contributions to Sustainable Development Goal 2 - "End hunger, achieve food security and improved nutrition and promote sustainable agriculture"

Agroecology

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Abstract

Agroecology has the potential to drive transformational change, taking a unique and systemic approach to meeting the significant rise in future food needs while ensuring that no one is left behind. This review aims to assess the relevance and contribution of FAO's agroecological work to the SDG 2 targets and the principles of the 2030 Agenda. Based on extensive documentation reviews and interviews, it draws on concrete experiences in Africa, Asia and Latin America, presenting three best-practice case studies from India, Senegal and Nicaragua. It examines FAO's role and importance in supporting the agroecological transition process, particularly in relation to its key tools and competencies. The study finds that FAO has three key advantages when it comes to supporting the upscaling of agroecology: i) it is a respected partner at government and policy level; ii) it has the requisite scientific and technical knowledge and a strong knowledge platform; and iii) it is seen as a neutral convenor and facilitator of multi-stakeholder processes. FAO's support "toolbox" for agroecology transition processes offers a broad and strong package of targeted interventions for agroecological development. The review recommends, among other things, that the new management of FAO be clearer and more emphatic in its communication and commitment to agroecology as a principal approach to achieving the SDGs. It also recommends that FAO capitalize on its decision to post agroecology focal points in regional offices, to facilitate knowledge sharing, synergies and cross-learning, also in relation to other agricultural initiatives.

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Abbreviations and acronyms

FAO	Food and Agriculture Organization of the United Nations
FFS	Farmer field school
MDF	Multidisciplinary Fund
SDG	Sustainable Development Goal
TAPE	Tool for agroecology performance evaluation

1. Introduction

1. Agroecology is an integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of food and agricultural systems. It seeks to optimize the interactions between plants, animals, humans and the environment while taking into consideration the social aspects that need to be addressed for a sustainable and fair food system. Agroecology is not a new idea. It has featured in scientific literature since the 1920s and found expression in family farmers' practices, in grassroots social movements for sustainability and the public policies of various countries around the world.

2. Agroecology takes a territorial perspective. It is based on bottom-up processes, helping to deliver contextualized solutions to local problems. Agroecological innovations are people-centred and based on the co-creation of knowledge, combining science with the traditional, practical and local knowledge of producers, traders and members of the food system. By enhancing their autonomy and adaptive capacity, agroecology focuses on the empowerment of producers and communities as key agents of change.

1.1 FAO's role in agroecology

3. Among the rich repository of integrated approaches developed by the Food and Agriculture Organization of the United Nations (FAO) over the years, agroecology has lately received much emphasis. It is integral to FAO's common vision for sustainable food and agriculture (FAO, 2014)[1] and received much attention during the October 2019 session of the Committee on World Food Security (CFS). FAO's framework on agroecology suggests ways to benefit from ecosystems services and to improve the resilience and sustainability of production systems in the landscape. It builds on other FAO frameworks, such as Save and Grow (FAO, 2011)[2] and the Sustainable Food and Agriculture frameworks (FAO, 2014), and recognizes ten elements gathered from literature and multistakeholder dialogues on agroecology (FAO, 2018a).

4. FAO has played a leading role in facilitating global and regional dialogue on agroecology since FAO's first International Symposium on Agroecology for Food Security and Nutrition in 2014. The Symposium provided an opportunity for stakeholders to share their experiences and build the evidence base for agroecology as a key approach to the transition to sustainable agriculture and food systems. In addition, the need to understand specific local needs and the contextual realities of agroecology led to a series of seven regional multi-stakeholder seminars co-organized by FAO and its partners 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 between 2014 and 2018.

1.2 The ten elements of agroecology

5. To guide countries in transforming their food and agricultural systems, to mainstream sustainable agriculture on a large scale and to achieve Sustainable Development Goal (SDG) 2 on Zero Hunger, as well as other SDGs, FAO's framework on agroecology draws on ten interlinked and

[1] The five FAO principles for sustainable food and agriculture are: i) improving efficiency in the use of resources; ii) conserving, protecting and enhancing natural ecosystems; iii) protecting and improving rural livelihoods, equity and social well-being; iv) enhancing the resilience of people, communities and ecosystems; and v) promoting good governance of both natural and human systems.

[2] With the publication of Save and Grow (FAO, 2011), FAO proposed a new paradigm of intensive crop production, one that was both highly productive and environmentally sustainable.

interdependent elements that emanated from the Organization's regional seminars on agroecology (Box 1).

Box 1. The ten elements of agroecology

Elements describing common characteristics of agroecological systems, foundational practices and innovation approaches:

i. diversity
ii. synergy
iii. efficiency
iv. resilience
v. recycling
vi. co-creation and sharing of knowledge

Context features:

vii. human and social values
viii. culture and food traditions

Enabling environment:

ix. responsible governance
x. the circular and solidarity economy

6. These ten elements are considered the fundamental framework and a guiding tool for policymakers, practitioners and stakeholders in planning, managing and evaluating agroecological transitions. Their aim is to help countries put agroecology into practice by identifying the important properties of agroecological systems and approaches, as well as the key considerations in developing an enabling agroecological environment.

1.3 Methodology

7. The study is based on a comprehensive desk review and interviews with a number of key stakeholders (see Appendix 1). It draws on concrete experiences in Africa, Asia and Latin America, presenting three best practice case studies from India, Senegal and Nicaragua. The study also examines the specific role and importance of FAO support in agroecological transition processes from the perspective of FAO's key tools and competencies.

8. The study has been guided by the following key evaluation questions:

i. What are the key and potential contributions of agroecology to achieving the SDG 2 targets?

ii. Is agroecology influencing (or what is the potential of agroecology to influence) the national/subnational policy environment, value chains, allocation of resources and investment, natural resource management practices and/or food production and consumption patterns? If so, in what way?

iii. Is FAO's approach and implementation based on one sector or does it facilitate the inclusion, coordination and interconnectedness of multiple sectors? Does the approach facilitate holistic and systemic solutions?

iv. What is the potential of agroecology to foster the inclusion of specific groups at risk of being left behind (such as women, youth, those living with disabilities, indigenous peoples,

ethnic minorities, migrants, displaced people and the extreme poor)? Are we seeing practical progress on this front at country level?

v. How is agroecology being expanded (on the ground through producers, organizations, markets, projects, etc.) and upscaled (through policy at different levels) and are these efforts proving successful? If not, what can be done to connect the top to the bottom?

9. The study seeks evidence on how and to what extent the upscaling and replication of good agroecological practices is taking place. It discusses what the particular triggering and hindering factors for scaling-up and replication may be and attempts to identify the main challenges and opportunities in this regard.

10. As FAO's work on agroecology seems to demonstrate cooperation with multiple partners, including other United Nations agencies, the study highlights examples of good partnership.

2. Background

11. Agroecology is based on social movement and inclusive processes. It empowers people to become their own agents of change.

12. Women's participation is essential to agroecology and women are frequently the leaders of agroecology projects. This is the case, for instance, in the large-scale agroecology interventions taking place in India and Senegal. In the Andhra Pradesh Community Managed Natural Farming (APCNF) programme in India, women are at the forefront of the agroecology transition programme, leading to the transformation of entire village communities. Through established self-help groups and federations at village level (village organizations), more than 150 000 women are leading the implementation of programmes by developing farming plans, preparing collective inputs, learning from peers, monitoring, verifying farmers, marketing products, etc. The APCNF programme also aims to explicitly involve the landless in its interventions, for example, through homestead gardening.

13. Agroecology is considered an opportunity to attract youth to agricultural production. The fact that agroecology is knowledge intensive, environmentally friendly, socially responsible and innovative are all factors that may appeal to young people. In Senegal, the Kaydara Agroecology School Farm was established in 2007 with the main purpose of addressing the challenges associated with villages being emptied of their youth. The farm's focus is to train young farmers in diverse and complementary agroecological practices, taking into account the need to restore soil fertility, protect the environment and manage water. This is done in cooperation with municipalities, which provide plots of land to the young farmer graduates.

2.1 Holistic approaches, interconnections and links to the SDGs

14. Agroecology has the potential to catalyse transformational change, as it takes a unique and systemic approach to meeting the significant rise in future food needs while ensuring no one is left behind. Agroecology seeks to transform food and agricultural systems, address the root causes of problems in an integrated way and provide holistic and long-term solutions. Thus, it is seen as having great potential to support the achievement of numerous SDGs.

15. Though agroecology covers elements of various SDGs, it primarily links to SDG 2 and addresses a number of SDG 2 issues in an integrated way. Several studies suggest that agroecology could be a solution to providing food security on a global scale. When agroecology is applied to production systems, it contributes to sustainable and resilient food production, thereby helping to maintain ecosystems and improve land and soil quality.

16. At the same time, agroecology can play a pivotal role in addressing nutritional issues by providing fresh, local, agroecological food and empowering consumers to follow varied and healthy diets based on traditional food culture and knowledge, thereby improving food system resilience – a useful tool against market shocks. In addition, many smallholder farmers are located in disaster- and climate risk-prone areas, as well as in mountainous areas. By adopting resilient agroecological methods, they can benefit from significantly less erosion and retain more topsoil.

17. Agro-biodiversity entails a diversity of plant and animal species and varieties used directly or indirectly for food production in agriculture, forestry and fisheries. This key element of agroecology can lead to a diverse range of available food products. Although it is complicated to truly achieve agricultural diversity, it plays an important role in improving dietary diversity, which is strongly associated with improved nutritional status.

18. Increases in yield and diversity alone will not be sufficient to address the global challenges of hunger, good health and well-being. Systemic change that tackles poverty, inequality and constraints on access is required to achieve these goals. A systemic approach that relies on ethical values, women's empowerment and youth employment presents an opportunity to address these issues in an integrated manner.

19. Agroecology also addresses a number of other SDGs, mainly: No Poverty (SDG 1), Good Health and Well-being (SDG 3), Decent Work and Economic Growth (SDG 8), Responsible Consumption and Production (SDG 12), Climate Action (SDG 13) and Life on Land (SDG 15).

2.2 Acting at scale

20. The process of global and regional dialogue on agroecology culminated in the Second International Symposium on Agroecology in 2018, which brought together lessons learned from regional meetings. Its primary focus was to enable and consolidate fundamental agreements and commitments to scale-up and expand agroecology at all levels to achieve the SDGs (FAO, 2018b).

21. This gave rise to FAO's Scaling Up Agroecology Initiative, which aims to support national agroecology transition processes through policy and technical capacity that builds synergies between countries. Its goal is to develop, implement and continuously improve tools, instruments and guidance documents to guide national agroecological transitions through alliance building, the co-creation of knowledge and knowledge sharing. The initiative endorsed the Ten Elements of Agroecology developed over the four-year process of FAO regional and international multi-stakeholder symposiums, combined with a thorough review of the seminal scientific literature on agroecology (FAO, 2018a).

22. Later in 2018, the 26th Session of the Committee on Agriculture (COAG) welcomed the Scaling up Agroecology Initiative, endorsed the Ten Elements of Agroecology and asked FAO to "assist countries and regions to engage more effectively in the transition processes towards sustainable agriculture and food systems by strengthening normative, science and evidence-based work on agroecology, developing metrics, tools and protocols" and to "evaluate the contribution of agroecology and other approaches to the transformation of sustainable agriculture and food systems".

23. For FAO, this marked a shift of focus from dialogue to action. The Organization now has a stronger mandate on agroecology, and Strategic Programme (SP) 2 (on sustainable agriculture) has been particularly instrumental in providing seed money for transdisciplinary projects. Different levels of the agroecology transition were evident in about 8 percent of FAO's planned results for 2018–2019 in support of transitions to sustainable food and agriculture (FAO, 2018c). In this context, FAO supported both formal and informal transition processes, as agroecology is really about the top-down (policy transformations) meeting the bottom-up (participation, expansion, knowledge creation, extension, etc.) and driving transitions forward and outward. Currently, the initiative is working formally with India (specifically the state of Andhra Pradesh), Mexico, Nicaragua and Senegal. In 2019, agroecological focal points were allocated to FAO's regional offices to bolster on-the-ground support for this specific initiative.

24. A report published in July 2019 by the High-Level Panel of Experts on Food Security and Nutrition (HLPE) provided further support to the agroecology drive. The report concluded that there was sufficient evidence to suggest that agroecological approaches could contribute to the transformation of food systems, particularly by supporting agriculture that was regenerative in its use of renewable resources and ecosystem services. The report recommended establishing and

using comprehensive performance measurement and monitoring frameworks for food systems that take full account of all economic, social and ecological impacts of paramount importance. It included specific recommendations for FAO to encourage data collection at national level, the documentation of lessons learned and information sharing at all levels to facilitate the adoption of agroecology.

25. Based on this request, FAO has undertaken comprehensive work to develop a multi-dimensional global agroecological assessment framework founded in the Ten Elements of Agroecology. The assessment framework – Tool for agroecology performance evaluation (TAPE) – aims to provide a diagnostic of agricultural performance on several dimensions of sustainability that moves beyond standard measures of productivity (such as yield per hectare) and better represents the benefits and trade-offs of different agricultural systems in a variety of contexts (FAO, 2019a). The framework was due to be piloted in the first half of 2020 but was delayed by the COVID-19 crisis.

3. Upscaling best practices

26. Many successful examples of agroecology exist at local level, offering innovative and context-specific solutions. Many are based on a combination of science and traditional, indigenous, practical and local knowledge (the co-creation of knowledge). However, most of these agroecological examples are widely dispersed and fragmented and there are only a few countries where the upscaling of agroecology interventions has taken place on a large-scale.

27. Three of the most prominent experiences of agroecology upscaling processes in Asia, Latin America and Africa are presented in the following paragraphs, including some historical and contextual background.

3.1 Asia and the Pacific

28. In Asia and the Pacific, the challenge of meeting food and nutritional needs has required an explicit focus on the protection of agroecosystems from further degradation and damage. While the Green Revolution[3] has helped to increase production in the region, it has been associated with the destruction of landscapes and soil and water contamination, as well as the loss of traditional farming systems and knowledge. Combined with the severe challenges of climate change, a new agricultural paradigm has increasingly been sought for the region.

29. Various agroecological practices have existed in Asia and the Pacific for some time, primarily as an alternative to conventional chemical-intensive farming based on Green Revolution prescriptions. These alternatives are often aimed at enhancing soil fertility through organic matter management and water conservation. Various terms are applied to these practices, including integrated farming, integrated pest management, conservation agriculture and agroforestry.

30. Although social movements and farmer networks in the region, such as *La Via Campesina* and the Asian Farmers' Association for Sustainable Rural Development, seek to promote agroecology as a path to food sovereignty, the social movements and bottom-up alliances have not pushed the agroecological agenda to the same extent as in Latin America and Africa. In most countries, agroecological initiatives have been driven mainly by governments (for example, in China, Viet Nam and, to some extent, in Cambodia and the Lao People's Democratic Republic). This may be down to differences in cultural, social and political context compared with Africa and Latin America.

3.1.1 Case study 1 (India)

Andhra Pradesh Community Managed Natural Farming (APCNF)

31. Zero-budget Natural Farming (ZBNF)[4] was developed in India in the mid-1990s as an alternative to the Green Revolution. At the time, Indian farmers found themselves in an increasingly vicious circle of debt due to high production costs, high borrowing rates, volatile crop prices and rising costs for fossil fuel-based inputs and privately produced seeds.

32. ZBNF is a set of farming methods – as well as a grassroots peasant movement – that have spread to various states in India. It has seen some success in southern India, especially in the southwestern

[3] The Green Revolution, or Third Agricultural Revolution, was the name given to a range of research and technological initiatives in the 1950s and 1960s that increased agricultural production globally.

[4] The word 'budget' refers to credit and expenses, thus, 'Zero-Budget' means without using credit or spending money on purchased inputs. 'Natural Farming' means farming with nature and without the use of chemicals.

state of Karnataka, from where it evolved. This has been achieved without any formal movement or organization, paid staff or even a bank account. ZBNF has inspired a spirit of volunteerism in its peasant farmer members, who are the main catalysts of the movement.

33. At the local level, the movement has a self-organized dynamic and runs in an informal way. Most practicing ZBNF farmers are informally connected to each other and carry out both organized and spontaneous farmer-to-farmer exchanges. Leaders tend to emerge naturally from the communities and all activities are carried out on a voluntary basis. Each district has its own style of organization and carries out its own activities in an autonomous fashion, with no central control.

The case of Andhra Pradesh

34. The largest agroecological upscaling initiative globally is the APCNF programme. The state of Andhra Pradesh is a major agricultural hub in India. Agriculture is its most important economic sector, employing nearly 62 percent of the population.

35. The APCNF programme was started by the Government of Andhra Pradesh through the (also state founded) *Rythu Sadhikara Samstha* (RySS) non-profit organization in 2015/16. It taps into the best global agroecological practices, but is largely based on ZBNF system protocols, to which it has incorporated traditional practices, the practices of non-governmental organizations (NGOs) and farmers' own innovations.

36. RySS, under the guidance of the State's Department of Agriculture, relies on three key theories of change in implementing the APCNF programme: i) transformation should happen in a democratic way, whereby women's collectives (through self-help groups and their associations) and farmers institutions are involved in programme planning, implementation and monitoring; ii) knowledge dissemination and handholding support is consistently available, provided by farmer-driven extension services, led by community resource persons (CRPs); and iii) the knowledge saturation of entire villages, clusters and the state at large (in that order) requires the conversion of all villages, farmers, farms and practices for total transformation.

37. According to APCNF, each farmer requires three to five years of handholding until she/he transitions to natural farming and converts her/his entire holding to natural farming. This support is spearheaded by a team of two or three master farmers, or CRPs, at cluster level, who are themselves best practitioners. The CRPs motivate and support farm households in adopting natural farming concepts and provide them with the support they need to smooth out the transition. After two or three years, a new pool of master farmers is identified from within the cluster and these homegrown best practitioners are nurtured to become farmer trainers. Cultivating and positioning these trainers is critical to sustaining and expanding the process.

38. APCNF had a clear upscaling strategy in place from the start. The most important upscaling drivers have been: i) establishing a farmer-to-farmer extension system; ii) support from women's self-help groups on collective action, knowledge dissemination, management, etc.; iii) long-term handholding support for each farmer; iv) a whole village approach; and v) the support of the State's Department of Agriculture in the transition process. In addition, government investment has been crucial to capacity building, knowledge dissemination, long-term support and the use of science-based evidence.

39. Farmers' own experiments are crucial to the success of the programme. Each farmer is experimenting with her/his farm. In the first year, they give over only a small portion of their land to natural farming (perhaps just 10 percent), while the rest of the land remains farmed by conventional methods. After seeing the results of the first crop, farmers invariably analyse the

differences in the two plots in terms of cost, yield, resilience, health impact, etc. They also engage in discussions with other farmers and then decide to expand the natural-farmed area. The pioneering farmers are also responsible for encouraging new farmers to enrol in the programme.

40. As of March 2020, the programme had spread to 3 000 villages, reaching 700 000 farmers and farm workers in 13 districts of Andhra Pradesh. The fact that the programme has been able to scale-up 17-fold (from 40 000 farmers to 700 000) in four years is a tribute to the "farmer scientists". Their success and the reasons behind it have inspired new farmers. Thus, the APCNF programme is not just about agroecological technology, but an ambitious and strategic implementation plan involving every farmer in the programme villages.

FAO's role and support

41. FAO has been an important ally to the APCNF programme since 2016. It has provided different kinds of support, including technical assistance, farmer field schools (FFS) (adopted to the APCNF approach), new science and innovation, support for scenario development and the convening of stakeholders, among other things. FAO has supported the implementation of FFS since 2018, focusing on soil health and integrated farming based on agroecological principles. The FFS approach is now being scaled-up throughout the state of Andhra Pradesh. FAO and other partners have developed different tools and exercises for discovery learning with farmers on topics such as soil health, cover crops and mulching which have been adapted to the APCNF practices and the local agroecosystem context. The most recent support from FAO has focused on developing different scenarios and forecasts for the evolution of agroecology in Andhra Pradesh through multistakeholder engagement, with a view to inspiring policy change.

3.2 Latin America

42. Focusing on the Right to Adequate Food, Brazil's public policy on agroecology, as well as that of other countries, has sparked discussion on the use of such an approach across Latin America. The process has helped to promote the status of agroecology in Latin America as an important component of national strategies for sustainable agricultural development and progress towards inclusive food systems, creating a virtuous circle among healthy food production, natural resource conservation and the strengthening of family farming and rural communities. This has marked the start of a dialogue between countries on regulatory frameworks and national policies to promote agroecology.

3.2.1 Case study 2 (Nicaragua)

La Via Campesina

43. When it comes to agroecology, Nicaragua is considered the most advanced country in Central America. As in other Latin American countries, the Nicaraguan peasantry has been using agroecological practices for centuries. In Nicaragua, agroecological development is largely considered a land issue (70 percent of land is owned by farmers). The social movement is strong and extensive experience has been gathered from the sharing of agroecological practices.

44. Nicaragua's agroecological movement began to organize itself in the early 1980s. However, the concepts of agroecology and organic agriculture only became institutionalized from 2007 with the emergence of a multi-stakeholder process developed by NGOs and agroecology associations. This led to the recognition of and support for family agriculture at national level as an alternative means of boosting sustainable intensification in the agriculture sector.

45. In 2009, the now defunct "Organic Roundtable" gave rise to the National Movement of Agro-ecology and Organic Producers, tasked with developing national proposals to promote agroecological and organic production. The National Union of Farmers and Ranchers of Nicaragua, a trade organization with more than 70 000 members, has similarly launched projects and programmes over the last decade to promote agroecology, with highly significant results in terms of volume and scale.

46. The Nicaraguan parliament passed the country's Law for the Promotion of Agroecological or Organic Production in 2011, which was followed by an executive order enacting it in 2012. A Mandatory Technical Standard was approved and passed in 2013 to characterize, regulate and certify agroecological production units. The Law and the Standard were discussed and agreed upon, based on the duties, rights and aspirations of women and men who have adopted good agroecological and organic practices in the management of their farms. This has made a substantial contribution to the health of farming families, food sovereignty and food security, and a healthy and nutritious diet. It has also promoted the capacity for organizational and technical innovation to deal with the risks associated with advancing climate change.

47. Agroecology is a dynamic sector in Nicaragua, with numerous programmes, actions and initiatives developed by the Government, the private sector and civil society. However, the initiatives need to be better coordinated and the synergies and complementarities between them need to be identified.

FAO's role

48. With the foundations already laid, FAO has been an important strategic partner in supporting the transformation of agri-food systems in Nicaragua. In 2018, the Government requested technical assistance from FAO in reviewing and updating its Agroecological Production Promotion Policy, led by the Ministry of Agriculture. The policy aims to facilitate the transition and development of sustainable, inclusive, integrated agri-food systems that are resilient to climate change and based on agroecological principles, to improve living conditions for producers and consumers, ensure healthy products for society and enable ecosystem services to recover and improve. The updating process included key partners (several ministries, other public institutions, universities and research institutions, social movements and the private sector) in a year-long process of workshops and exchanges with national and international experts. FAO has also helped to promote the policy – a key concern for the Government of Nicaragua, as agroecology is seen as a key option for family farming.

49. Lastly, through the participatory process and regional consultations, the necessary elements were brought together to formulate an investment project (Agroecology Family Farming) as a post-COVID-19 agri-food strategy for Nicaragua. The project should help speed up the implementation of the activities prioritized in the policy implementation plan.

3.3 West Africa

50. In West Africa, agroecology is often an integrated part of FFS and central to agricultural transition processes. Agroecology underpins the FFS learning methodology, where results are developed through a process of knowledge co-creation and innovative practices tailored to the specific cultural and environmental context. Global Environment Facility (GEF)-funded projects have supported the adaptation of farmers and agro-pastoralists to climate change in Angola, Burkina Faso, Mali and Mozambique, where participants have also included various ministerial representatives to generate a holistic view of agroecology across different sectors. In addition, through the Multipartner Programme Support Mechanism (FMM) Enhancing biodiversity and

nutrition through agroecology in Mali and Burkina Faso project, FAO has supported a series of workshops to give farmers' organizations and other civil society actors an opportunity to discuss the need for policy to support an agroecological transition in West Africa.

3.3.1 Case study 3 (Senegal)

ENDA Pronat

51. Senegal is the leading country on agroecology in West Africa. Agroecology emerged there in the 1980s, when severe climate hazards, strong population growth and adverse environmental consequences of the Green Revolution made it necessary to take a fresh look at agricultural development strategies and foster more sustainable practices. Agroecology offered a promising solution and opened new horizons for future generations. Its evolution has been marked by the implementation of myriad local initiatives, mostly carried out by NGOs, farmers' organizations, private-sector and national-level platforms.

52. For more than 30 years now, Senegal's focus has been on integrated and sustainable land management, water and soil conservation practices, crop associations, the biological control of plant pests, and organic conservation methods for agricultural products and agroforestry. Along the same lines, universities and research centres, such as the International Cooperation Centre of Agricultural Research for Development (CIRAD), have long been involved in creating and disseminating knowledge, training personnel, supervising agricultural practices and promoting products from healthy and sustainable agriculture. At the same time, various agroecology pilot projects have produced tangible results on three levels: at the socioeconomic level (promoting consumer awareness on products' origin, encouraging healthy food and enhancing the local economy by ensuring short market supply chains); at the environmental level (promoting organic fertilizers and biocides); and at the political level (public authorities have shown an interest in agroecology as part of the political discourse and agenda).

53. Building on these decades of practical experience and learning, Senegal has recently seen its achievements create real momentum for agroecology in the country. Two major results should be emphasized: i) the Government of Senegal included the country's agroecological transition in the five major initiatives of the Priority Action Plan of the second phase of the *Plan Sénégal Emergent* (2019–2024), the key national policy framework supported by the President; and ii) producer organizations, civil society organizations, research centres, consumers, local authorities and ministries decided to join forces and create an umbrella initiative to co-create a policy position paper (through a participatory, bottom-up process) to support the Government's commitment and to move towards an effective agroecological transition. This unitary framework, called *la Dynamique pour une Transition AgroEcologique au Sénégal* (DyTAES), consolidates all the numerous existing platforms and initiatives.

54. The policy position paper prepared by DyTAES on the country's agroecological transition was handed to the Government in early 2020. The paper, which aims to stimulate political dialogue on the agroecological transition, was the result of a broad consultation process (between July and October 2019) with stakeholders at different levels in the country's six main agroecological zones. The process aimed to: i) conduct a diagnostic survey of the challenges facing agricultural development in general; ii) raise awareness of the agroecological transition; iii) identify local initiatives on agroecology and collect best practices from activities on the ground; iv) identify specific challenges and opportunities for agroecology; and v) produce recommendations.

55. Around 1 000 local stakeholders participated over the course of six public consultation rounds. A final consultation took place in Dakar, targeting consumers and consumer organizations. The

survey, the most extensive agricultural survey ever conducted in Senegal, highlighted 26 promising agroecology initiatives, including some with a focus on women producers. The final DyTAES document, entitled Contribution to national policies for an agroecological transition in Senegal, includes a diagnosis of the current situation of agriculture in Senegal as well as a set of policy recommendations for the country's agroecological transition.[5] The document sets four main objectives: i) improve and secure the production bases (natural resources, seeds, biodiversity, etc.); ii) boost productivity (for instance by facilitating access to organic inputs or quality planting material) and agro-silvo-pastoral and fishing production operations in a sustainable way; iii) promote the products of agroecology within value chains; and iv) improve governance and funding of a large-scale agroecological transition.

56. In the short-term, the report pinpoints three priorities for scaling-up agroecology: i) establish a framework for national multistakeholder dialogue to build a national agroecological transition policy integrating the objectives set by DyTAES; ii) encourage and provide financial support for experiments at municipal or departmental scale, in which stakeholders work together to design and implement a territorial plan for agroecological transition; and iii) pinpoint and implement immediate measures capable of leveraging the agroecological transition (such as subsidizing biofertilizers and biopesticides, cutting the price of productive water and providing support for assisted natural regeneration strategies).

57. DyTAES proponents see the report as the first step towards a dialogue and contribution to state action on agroecology in the longer-term. The framework in essence aims to carve out a way for promoters of agroecology to work and evolve into a strong unified "proposing power", backed by growing institutional commitment. The idea is to build proposals from a participative consultation process at local level and identify how these can be promoted and implemented within existing policy frameworks.

ENDA Pronat and the "Mother of Agroecology"

58. A key driver behind agroecological development in Senegal is the work of ENDA Pronat (*Association pour l'Environnement et Developpement Action pour une Protection Naturelle des Terroirs*)[6] and, in particular, Mariam Sow, its executive secretary and member of DyTAES (also referred to as the "Mother of Agroecology" in Senegal). Since the late 1990s, ENDA Pronat has gradually expanded its activities to promote agroecological practices (including crop diversification and organic pest and disease management, composting and mulching, and livestock integration) alongside its work on environmental education, gender issues, the promotion of savings and credit, and sustainable development for family farms.

59. ENDA Pronat's strategic approach is based on farmer-led action research. This includes a reappropriation of research and extension by small-scale family farming (peasant) communities. Projects supported by ENDA Pronat have been co-designed with farmers' organizations and are part of a continuous process of research-action-training involving participatory diagnosis to identify potential solutions to problems before villagers actually face them. Their hypotheses are tested in field experiments and assessed each year, so as to reorient actions if necessary.

60. After it became evident that women were primarily attending training sessions in FFS and that men were receiving less support this way, the learning process was reoriented towards

[5] Experts from structures belonging to DyTAES were involved in drafting the report, coordinated by CIRAD. For a synthesis report for policymakers, see: DyTAES (2020) (in French only).

[6] ENDA Pronat is part of ENDA Third World, an international NGO. It was established in 1982 to provide alternatives to the massive use of synthetic agrochemicals.

experimentation through agroecological pilot fields, led by heads of household (men and women). All producers gathered for practical training sessions, creating "model fields" for exchange visits.

61. This entire narrative is in line with ENDA Pronat's self-organization strategy that, rooted in an awareness of the deterioration of living conditions and the processes of impoverishment, farmer collectives can be formed into associations specifically to defend their rights, search for solutions to problems and implement them. ENDA Pronat supports these collectives in widening their reach to an appropriate critical mass that enables them to realize economic and political power (for example, organizing local micro-finance, purchasing and trading and marketing of products) and influencing local authorities making their voice heard at national level).

FAO's role and support

62. FAO has been a major catalyst and facilitator of the agroecological transition process in Senegal. In 2015, FAO chose Senegal as an agroecological pilot country and as one of the pilot countries for FAO's Scaling Up Agroecology Initiative. Since then, Senegal has been a preferred site for agroecology projects driven by the Economic Community of West African States (ECOWAS). Since 2017, international and regional players, such as the *Alliance pour l'Agroécologie en Afrique de l'Ouest* (3AO), have stepped up their commitment to agroecology. Through the Ouagadougou Declaration on Employment and Poverty Alleviation in Africa and several regional projects (such as the DeSIRA Initiative, the territorial One Health project), those in political circles, donors and the agricultural research sector have expressed their intention to work together on agroecological practices and values in the Sahel.

63. Building on the two international symposia on agroecology co-organized by FAO in 2015 and 2018, the first held in Dakar and the second in Rome, Senegal has pursued a number of initiatives to promote the adoption of climate-resilient approaches throughout the country, supported by FAO and other partners. This has included FFS, adapted to the agroecological context.

64. FAO's Multidisciplinary Fund (MDF) supported the agroecology workshops held within the country's six agroecological zones, bringing together farming communities, local and national authorities, NGOs, producer organizations', academia and other stakeholders. The workshops included field visits to assess the extent to which agroecological principles were being applied and assembled local communities for participatory diagnoses and quantitative surveys to formulate recommendations and a roadmap for the area's agroecological transition.

65. They have proven a means of strengthening collaboration between disciplines and across organizational boundaries, boosting FAO's effectiveness in priority areas of work and encouraging creative measures that make the delivery and monitoring of FAO's programmes more efficient and effective. As with other MDF initiatives, the work carried out in Senegal combines FAO's expertise with that of its country partners to empower institutions and communities.

66. Other supported actions include multi-stakeholder days for the development of agroecology in West Africa, organized by the Task Force for the Promotion of Agroecology in Senegal (TaFAé); the signing of a charter for green cities and towns, committing more than 50 local authorities to the promotion of agroecology; and regional and national workshops organized alongside civil society organizations and other partners.

4. Challenges and opportunities for FAO in upscaling agroecology

67. FAO has three key advantages when it comes to supporting the upscaling of agroecology: i) FAO is a respected partner at government and policy level; ii) it has the scientific and technical knowledge and a strong knowledge platform; and iii) it is seen as neutral and can convene and facilitate multi-stakeholder processes.

68. FAO's support "toolbox" for agroecology transition processes mainly comprises the following tools and instruments: the Ten Elements of Agroecology (FAO, 2018a); its Scaling Up Agroecology Initiative; FFS (adapted to agroecology); the Agroecology Knowledge Hub (FAO, n.d.); the TAPE (FAO, 2019a) and the MDF. The toolbox provides a broad and strong package of targeted interventions for agroecological development.

69. In addition, FAO's recent decision (from 2019) to assign agroecological focal points to regional offices presents a unique opportunity for agroecology mainstreaming and knowledge sharing within the regions. The fact that the focal points are also engaged in backstopping and other FAO-supported agricultural interventions makes it possible to establish useful synergies. For example, combining family farming (the United Nations Decade of Family Farming) and agroecology would be useful, as the approaches have many similarities. In general, it allows for greater mainstreaming of agroecology in new projects through the inclusion of some of the ten elements of agroecology (not necessarily all).

70. A potential challenge of the current trends and direction of FAO could indicate a growing focus on production levels, innovation in a narrow technological sense and the private sector, and a decreasing focus on nutrition and qualitative, and social production and sustainability. It could be argued that FAO still sees agroecology primarily as a production approach due to its organizational placement in a technical production division, rather than as an overarching initiative to bring about transformative change in food and agricultural systems on different dimensions of sustainability. This could lead to a lack of attention on the more qualitative and social aspects of agroecology.

71. Another drawback of placing agroecology in the Department of Agriculture is that this could limit opportunities for collaboration with other technical departments, given the potential for further incorporating and upscaling agroecology in FAO's work. This potential might be better fulfilled by integrating agroecology into all agricultural sectors (crop and livestock production, forestry, aquaculture and fisheries) and transitioning towards sustainable food system approaches in collaboration with partners particularly at country and regional level (FAO, 2018c).

72. Agroecology also ties in with key elements of climate-smart agriculture (CSA), although there are also conceptual differences between the two approaches. While CSA has a strong focus on resilience at farm system level, agroecology takes a broader systems approach, including markets, nutrition, culture and animal health aspects. FAO aims to ensure some level of coordination of different sustainability approaches, but merging these approaches might create greater coherence. To do this, FAO would need to turn agroecology into a higher-order, cross-cutting function, rather than confining it to a particular technical division.

73. Agroecology has the potential to be conducted at scale, but there are currently few large-scale agroecological cases. Large-scale agroecological implementation will require national and regional governments to commit to the concept. This, in turn, will require stronger field-based

evidence. Currently, governments are providing limited funding to agroecology, but interest in the area is growing.

74. Many countries are still not sufficiently prepared for large-scale agroecological transformation. Many governments still do not see agroecology as a solution to their production and productivity problems and fail to see the connections. This will require a change of mindset. National priorities translated into policies often seem to be more oriented towards maximizing production, with no real effort made to tackle environmental issues. The idea of generating economic gains through exports without any consideration for environmental sustainability often surfaces in discussions, thus relegating alternative options such as agroecology.

75. The concept of agroecology is seen as relatively new and is still the subject of much confusion, particularly because of many other concepts in parallel, in particular, "organic farming" in the 1980s, "sustainable agriculture" in the late 1990s and "healthy and sustainable agriculture" in the early 2000s. Thus, the absence of a common understanding of the holistic principles of agroecology often hinders its translation into political vision. Likewise, there is lack of a common framework among stakeholders for formulating policy proposals that build on agroecological elements. Here, agricultural research organizations are often only involved at a low level nationally, so the proposals lack economic, social and environmental viability.

76. Agroecological farming is knowledge-intensive and not input-intensive. Consequently, extension and intensive handholding play a critical role. Capitalizing on synergies between multiple stakeholders is also key to scaling-up agroecology, as it is an interdisciplinary and multi-scaled approach. Moreover, policymakers are increasingly looking for scientific evidence, also in relation to agroecological interventions, when formulating new policies.

77. Current market systems are not responding to agroecological approaches. Markets that are developed as vertical value chains for single products do not meet the needs of diversified agroecological production systems or consumers of diversified and healthy diets, particularly the needs of small-scale food producers or poor urban consumers. In recent years, policies have mainly focused on strengthening global value chains, ignoring the important role of local and regional markets.

78. These recommendations are based on a rapid review of a large programmatic area and should be taken as suggestions for programme development.

5. Recommendations

Recommendation 1. There needs to be clearer and stronger communication and commitment from FAO's new management, (re)confirming that agroecology remains a principal approach for achieving the SDGs. This should include the allocation of regular programme funds to support the promising agroecological initiatives that have been launched in recent years (such as the Scaling Up Agroecology Initiative, the Knowledge Hub and TAPE).

Agroecology has the potential to be the most promising systemic approach to unlocking adaptation and mitigation potential in agriculture and food systems and to building resilience for sustainable development. In addition, and in line with the 2030 Agenda, agroecological approaches seem to provide an immediate solution to the current COVID-19 pandemic situation, which requires an urgent transition to sustainable food systems. However, there is insufficient evidence to support these claims, as well as too little information on the challenges and constraints that need to be considered when building on the agroecological approach.

Field experience demonstrates that agroecology is both a holistic and inclusive approach, with clear potential to be transformative. Other key stakeholders greatly appreciate the role and leadership FAO has taken in this area to support national efforts throughout the agroecological transition process. FAO is seen as having a strong and unique convening capacity to facilitate multi-stakeholder engagement (internationally, regionally and nationally) to build a common vision and unify advocacy efforts towards agroecology policymaking and support. It is further able to provide targeted scientific-based, technical assistance to agroecological field interventions (for example, through adapted FFS sessions).

Recommendation 2. FAO should capitalize on its decision to post an agroecology focal point in each regional office to facilitate knowledge sharing, synergies and cross-learning, including in relation to other agricultural initiatives (such as family farming). Likewise, FAO should explore the possibility of using these resources more strategically to mainstream agroecological elements into other FAO programmes and projects (on a pilot basis).

The decision to post an agroecology focal point in each of the regional offices has boosted FAO's opportunity to further promote agroecology across the regions. However, this additional resource may not be sufficient in view of increasing demand and the fact that the focal points are also tasked with other (sometimes unrelated) work.

Experience shows that it is difficult to implement the ten elements of agroecology at the same time. In most cases, it will only be possible to implement a few through a given intervention. Likewise, in many countries, the term "agroecology" is still controversial at government level, so agroecological elements may need to be labelled otherwise in other programmes or projects.

Recommendation 3. FAO should prioritize supporting the further strengthening of the agroecological scientific evidence base and facilitate its translation into national policy development and field interventions.

Particular attention should be paid to supporting the broad-based implementation of the TAPE tool and the proper linkage of collected data and indicators to the FAO Statistics Division (ESS) and the Hand-in-Hand Initiative platform. All key stakeholders view TAPE as a potential game changer that could provide a real boost to agroecology transition processes worldwide.

Agroecological experts believe that after a few years of strong momentum, more data are now needed to garner evidence-based support for the upscaling of agroecological initiatives, including the support of national governments and potential investors. FAO is well positioned to convene key national research and social agroecological movements to solidify the participatory, scientific knowledge and information base on agroecology as an input and advocacy tool for policymaking.

At the farming level, support should focus on facilitating farmers' own "scientific" experiments and their ability to share this learning with other farmers (for example, through an adapted FFS approach, based on a farmer-to-farmer network/extension, where farmers themselves become master trainers/model farmers over a longer period of time, using their own plots as demonstration sites). Experience to date shows that a critical mass of locally organized agroecological farmers, with dynamic connections to other key stakeholder groups, has the potential to drive forward transformative agroecological processes at national level.

Recommendation 4. FAO should maintain its crucial support for inclusive multi-stakeholder engagement, including for farmer mobilization and self-organization (outscaling) and their participation in agroecological policy development (upscaling). More analysis should also be conducted on the dynamics of outscaling and upscaling, including top-down and bottom-up mechanisms, to make FAO's agroecological upscaling initiative more efficient.

This would imply a more strategic focus on the horizontal dimension of government and governance structures and interactions, and on how these institutions could contribute to increased outscaling and spillover of agroecological practices at local and regional level. As experience shows, a critical mass of agroecological farmers and multi-stakeholder alliances is often needed to catalyze national upscaling processes (through central government).

At the same time, the growing attention on the use of "territorial approaches", combined with more decentralized decision-making processes in many countries are making local and regional governments more powerful in developing interventions locally. However, this also makes governance structures more complex, as policies need to be integrated at scale (local, regional and national) and across sectors (from agriculture, fisheries and forestry to the economic, social and environmental sectors).

Recommendation 5. To boost the sustainability aspects and scaling potential of agroecology, FAO should do more to support the development of new local marketing structures and marketing support measures for agroecological products, including participatory community-based guarantee systems and the inclusion of external costs and ethical values in new trade policies.

In many developing countries, consumer groups need to become better prepared and organized to support agroecological initiatives. This will include more emphasis on local and regional markets to encourage diversified production and greater access to healthy food for better diets. Successful models that reconnect producers and consumers, rural and urban areas (such as community-supported agricultural schemes, public procurement programmes, e-commerce and participatory guarantee schemes) need to be strengthened, while agroecological producers need better access to these market opportunities.

The possibility of supporting participatory, community-based guarantee systems (locally focused quality assurance systems) should also be explored further, based on the active participation of stakeholders and built on a foundation of trust, social networks and knowledge exchange. As these systems are based on social control, they are less expensive than organic certification systems (typically based on individual certification) and, therefore, more affordable for smaller farmers.

Recommendation 6. FAO should capitalize on its well-established alliances on agroecology with other agencies and invest in piloting emerging opportunities for strategic cooperation and funding, such as higher education and climate/resilience, recognizing that agriculture is more closely linked to knowledge and social norms than to technologies.

There seems to be significant potential for FAO to cooperate with the International Fund for Agricultural Development (IFAD) due to the complementarity of the two agencies and the well-established cooperation they have developed, both on TAPE and at country level (for example, in Argentina and Mexico). While FAO is seen as having strong and respected convening capacity at national level, IFAD has

better access to funding, including from private sector and impact investors. The launch of TAPE may also be an opportunity to bolster cooperation.

The clear link between agroecology and climate change/resilience offers obvious potential for the inclusion of agroecological perspectives and elements in applications for climate funding. Likewise, as part of its agroecology upscaling initiative, FAO should pilot studies to explore the extent to which gaps in curriculums at higher-level agricultural educational institutions are becoming bottlenecks to improvement and the widespread dissemination of agroecological practices and how such gaps could be addressed through different alliances and partnerships (for example, through closer cooperation with the United Nations Children's Fund (UNICEF) in some countries).

Recommendation 7. FAO should lend stronger support to the development of a new "knowledge paradigm" for agroecological systems, including the application of novel technologies (such as digitalization) and greater cooperation between scientific disciplines, as well as with the private sector.

Current research, education and extension systems do not respond sufficiently to the needs of agroecology as an approach to effectively transform food and agricultural systems. Agroecological systems are diverse, maximizing the synergies between different components (such as soil, water, crops, livestock, trees, aquatic plants and animals, and human processes) to ensure more efficient use of resources and resilience. Managing these interactions depends on locally adapted knowledge. Despite growing calls for change, many current research, education and extension systems focus on single disciplines, increasing the yields of single commodities and top-down technology transfer models. To scale-up agroecology, rural education and extension systems need to be strengthened and a different means of knowledge cocreation must be promoted to combine scientific knowledge with the knowledge of food producers.

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Appendix 1. People interviewed

Last name	First name	Organization/Division	Position
Bicksler	Abram	Agroecology and Ecosystem Services Team (NSPED)	Agricultural Officer
Ferrand	Pierre	FAO RAP	Agroecology Officer/Focal Point
Houlmann	Romain	FAO RLC	Agroecology Officer/Focal Point
Kuehne	Isabel	FAO RAF	Agroecology Officer/Focal Point
Kumar	Vijay	I.A.S (retired)	Adviser to the Department of Agriculture of the Government of Andhra Pradesh, Vice Chairman of RySS
Loconto	Allison	FAO, Innovation and Markets, Agroecology	Consultant
Mondovi	Stefano	FAO, NSP	Agricultural Officer
Olivera	Rikke	IFAD	Senior Technical Specialist on Natural Resources
Philips	Suzanne	FAO, NSP	Farmer Field School and Climate Resilience Consultant
Poisot	Anne Sophie	FAO, NSP	Agricultural Officer
Sanchez	Marlen	Equipo Técnico Secretaría Operativa CLOC/LVC, Nicaragua	Secretaría de Relaciones Internacionales ATC
Sherwood	Stephen		Consultant/Researcher, Agroecology
Siliprandi	Emma	FAO, NSP	Agricultural Officer

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