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Our Ref.: Your Ref.:

Ten Elements of Agroecology

Submission by the Food and Agriculture Organization of the United Nations to the development of the Post-2020 Global Biodiversity Framework

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The 163rd Session of the FAO Council approved the revised version of The Ten Elements of Agroecology (CL 163/13 Rev.1) as a living document and commended the inclusive consultation process conducted following the request of the 41st Session of the FAO Conference.[1]

The Ten Elements of Agroecology as contained in *Annex 1* is submitted to the Co-chairs of the Open-ended Working Group for consideration in the consultations on the post-2020 Global Biodiversity Framework.

[1] CL 163/REP, paragraph 10

***Annex 1*: Ten Elements of Agroecology** (from CL 163/13 Rev. 1)

THE 10 ELEMENTS OF AGROECOLOGY

1. Innovative, sustainable agricultural approaches, practices and technologies, including agroecology as one of these, play a critical role in the transition towards, and to strengthen sustainable agriculture and food systems in order to successfully combat hunger, malnutrition and poverty and contribute to the advancement of the 2030 Agenda.

2. Agroecology is one approach, among others, to contribute to feeding sustainably a growing population and support countries in achieving Sustainable Development Goals. Agroecology considers the interactions among key environmental, social and economic characteristics that are typical of diversified agricultural systems. It recognizes the great potential of knowledge sharing, and deepened understanding, that favour the behavioural changes in food systems that are required for sustainable agriculture to become a reality.

3. The 10 elements of agroecology provide guidance to achieve the transformation, as appropriate, towards environmentally, socially and economically sustainable agriculture and food systems to achieve Zero Hunger and multiple other SDGs.

4. The 10 elements characterizing agroecology were developed through a synthesis process. They are based on the seminal scientific literature on agroecology (Altieri 1995); (Gliessman 2015).This foundation was complemented by input from international and FAO experts and by discussions held in workshop settings during FAO's multi-actor regional meetings on agroecology from 2015 to 2017.

5. The 10 elements are further described in a FAO publication made available for the 2nd International Symposium on Agroecology: "The 10 elements of agroecology, guiding the transition to sustainable food and agricultural systems" (FAO 2018).

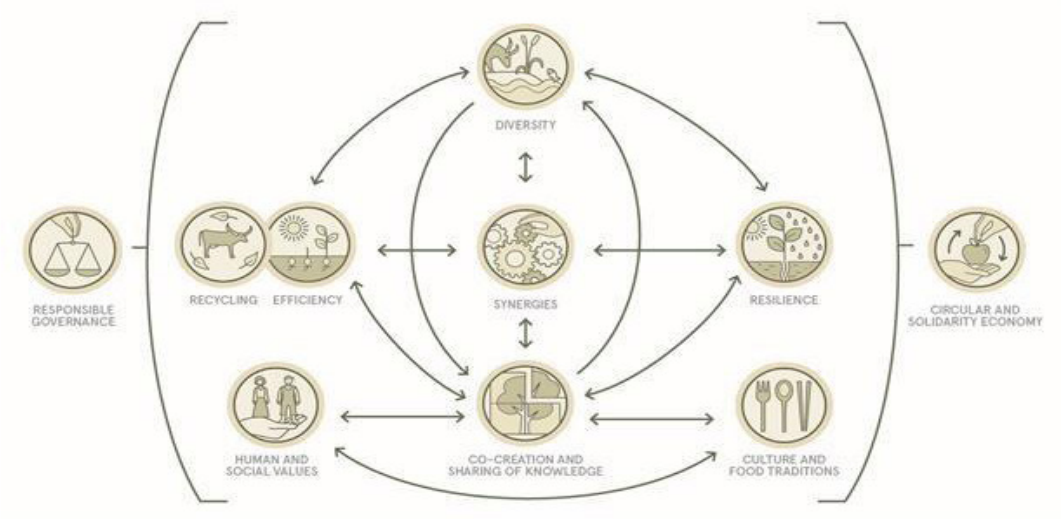
6. As an analytical tool, the 10 elements aim to help countries to operationalise agroecology. By identifying important properties of agroecological systems and approaches, as well as key considerations in developing an enabling environment for agroecology, the 10 elements serve as a voluntary guide for policy makers, practitioners and stakeholders in planning, managing and evaluating agroecological transitions.

7. The 10 elements contribute to multi-dimensional assessment tool that FAO is developing to generate further evidence on agroecology's performance across the three dimensions of sustainability.

8. The 10 elements do not address international trade-related issues. Measures to promote agroecology and other sustainable approaches should be implemented by States consistently with their national and international obligations, including those relevant to trade issues, as well as with due regard to voluntary commitments under applicable regional and international instruments.

9. The 10 elements of agroecology are interlinked and interdependent.

The ten elements of Agroecology



I. DIVERSITY. Diversification is a key component of agroecology to promote and can contribute to food security and nutrition while conserving, protecting and enhancing natural resources. Agroecological systems are highly diverse. From a biological perspective, agroecological systems optimize the diversity of species and genetic resources in different ways. Increasing biodiversity contributes to a range of production, socio-economic, nutrition and environmental benefits. By planning and managing diversity, agroecological approaches enhance the provisioning of ecosystem services, including pollination and soil health, upon which agricultural production depends (Landis, Wratten and Gurr 2000) (Kremen and Miles 2012) (Bommarco, Kleijn and Potts 2013) (Midega, et al. 2018) (El Mujtar, et al. 2019). Agroecological diversification contributes to soil health by fostering soil management that minimizes soil erosion, enhances soil carbon storage, promotes soil nutrient balance and cycles, and preserves and enhances biodiversity, including soil biodiversity. Diversification can increase productivity and resource-use efficiency by optimizing biomass and the management of water resources, especially water harvesting. Agroecological diversification strengthens resilience and the three dimensions of sustainability (Tscharntke, et al. 2005) (Tomich, et al., 2011) (Lin 2011) (Tittonell 2014) (Altieri, Nicholls, et al. 2015). Agroecological diversification can create new markets opportunities. Soil health, as well as crop and animal diversity, reduce the risk of failure in the face of climatechange.

II. CO-CREATION AND SHARING OF KNOWLEDGE AND PRACTICES, SCIENCE AND INNOVATION. Agricultural innovations can respond better to local challenges when they are co-created through participatory processes. Agroecology does not offer fixed prescriptions – rather, practices are tailored to fit the environmental, social, economic, and cultural context. The co-creation and sharing of knowledge plays a central role in the process of developing and implementing agroecological innovations to address challenges across food systems including adaptation to climate change. Through the co-creation process, agroecology blends traditional, indigenous and local knowledge, and scientific knowledge and practices. Producer's knowledge of agricultural biodiversity and management experience for specific contexts as well as their knowledge related to markets and institutions are essential elements in this process. Education – both formal and nonformal – plays a key role in sharing agroecological innovations resulting from co-creation processes, creating opportunities for inclusive farmers' capacity building and promoting the participation of, and exchange between the various local actors, especially women and youth.

III. SYNERGIES. Building synergies can enhance key functions across food systems, supporting production and multiple ecosystem services. Agroecology pays careful attention to the design of diversified and synergistic systems, including the combination of annual, perennial and cover crops, livestock, aquatic animals, and trees. It pays particular attention in the sustainable use of soils, water and other components of farms and agricultural landscapes to enhance resilience in the context of climate change. To promote synergies within the wider food system, and best manage trade-offs, agroecology emphasizes the importance of partnerships, cooperation and responsible governance, involving different actors at multiple scales, including multistakeholder partnerships.

IV. EFFICIENCY. Innovative agroecological transitions move from input-intensive systems to information and knowledge-based systems of agricultural and food production aiming at further increasing productivity while reducing the use of external inputs. Increased resource-use efficiency is an emergent property of agroecological systems that carefully manage diversity to create synergies between different system components. Agroecological systems improve the efficiency in the use of natural resources, in particular those non-renewable, and to turn to those that are abundant and free, such as solar radiation, atmospheric carbon and nitrogen. By enhancing biological processes and recycling biomass, nutrients and water, producers can use available resources more efficiently, reducing costs and negative environmental impacts and contributing to an increase their net incomes

over time (Altieri, Funes-Monzote and Petersen 2012), (Gliessman 2015), (van der Ploeg, et al. 2019), although returns to labour may not increase in the short term (Ajayi, et al. 2009).

V. RECYCLING. More recycling supports an agricultural production with less waste and emissions and reduces economic and environmental costs. By imitating natural ecosystems, agroecological practices support biological processes that drive the recycling of nutrients, biomass and water within production systems, thereby increasing resource use efficiency. Recycling can take place at farm-scale and within landscapes, through diversification and building of synergies between different components and activities. Recycling delivers multiple benefits by closing nutrient cycles and reducing waste. Recycling also permits the development of systems of low use of external inputs, reduction of input costs, which favours resilience and adaptation of agroecological systems to climate change and price volatility. Recycling organic materials by-products and organic waste offers great potential for agroecological innovations.

VI. RESILIENCE. Enhanced resilience of people, communities and ecosystems is key to sustainable agricultural and food systems. Diversification enhances resilience to disturbances, including extreme weather events such as drought, floods or hurricanes and to resist pest and disease attacks. By maintaining a functional balance, agroecological systems enhance resilience to pest and disease attack (Holt-Giménez 2002) (Altieri, Nicholls, et al. 2015). Agroecological practices aim to work with the biological complexity of agricultural systems promoting a diverse community of interacting organisms to allow the ecosystem to self-regulate when facing pest and disease outbreaks. On a larger scale, diversified agricultural landscapes have a greater potential to contribute to pest and disease control functions building on ecosystem services (e.g. natural enemies for biological control) (Landis, Wratten and Gurr 2000) (Tscharntke, et al. 2005) (Kremen and Miles 2012). Agroecological approaches aim to enhance socio-economic resilience. Through diversification and integration, producers can better manage risks and thus reduce their vulnerability should a single crop, livestock species or other commodity fail. By reducing dependence on external inputs, agroecology can also reduce producers' vulnerability to economic shocks.

VII. HUMAN AND SOCIAL VALUES. Improving rural livelihoods, including income and equity is essential for sustainable food systems. Agroecology emphasizes human and social values and inclusion of all contributing to the improved livelihoods dimension of the SDGs. Agroecology seeks to address gender and intergenerational inequalities by creating opportunities for women and youth. By building autonomy and adaptive capacities to manage their agro-ecosystems, agroecological approaches can empower people and communities to overcome poverty, hunger and malnutrition (Altieri and Toledo 2011). As a bottom-up, grassroots paradigm for sustainable rural development, agroecology can empower people to become their own agents of change.

VIII. CULTURE AND FOOD TRADITIONS. Agriculture and food are core components of the human heritage. By supporting healthy diets, reminding cultural values of dietary and eating habits in different cultures, agroecology contributes to sustainable agriculture for food security and nutrition while maintaining healthy ecosystems. Culture and food traditions play an important role in society and in shaping human behaviour. The genetic diversity is important in contributing macronutrients, micronutrients and other bioactive compounds to human diets. Cultural identity and sense of place are often closely tied to landscapes and food systems. As people and ecosystems evolved together, cultural practices and indigenous and traditional knowledge offer a wealth of experience that can inspire innovative solutions.

IX. RESPONSIBLE GOVERNANCE. At different scales, agroecology requires responsible governance mechanisms which ensure the effectiveness of action on the ground, while supporting transitions to sustainable agriculture and food systems, in line with existing national legislative frameworks. Transparent, accountable and inclusive governance mechanisms are necessary to create

an enabling environment that supports producers to transform their systems, as appropriate, considering agroecological concepts and practices. Land and natural resources governance is a prime example. The majority of the world's rural poor and vulnerable populations heavily rely on terrestrial and aquatic biodiversity and ecosystem services for their livelihoods, yet lack secure access to these resources.

X. CIRCULAR AND SOLIDARITY ECONOMY. Circular and solidarity economies that reconnect producers and consumers provide sustainable and innovative solutions, reducing negative externalities, and make more efficient and sustainable use of natural resources while promoting the social foundation for inclusive and sustainable development. Agroecological approaches can help promote fair solutions based on local needs, resources and capacities, which contribute to creating more equitable and sustainable markets. Strengthening food supply chains, including short supply chains, can increase the incomes of food producers. These include new innovative markets, along with more traditional markets, where most smallholders sell their products. Institutional innovations play a key role in encouraging production and consumption based on agroecological approaches appreciating the importance of biodiversity and ecosystem services.

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