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Climate Change and Food Insecurity: Unleashing the Promise and Potential of Agroecology in the Mediterranean

by Andrea Di Bernardo



It has long been acknowledged that climate change represents a direct and multidimensional threat to humanity as a whole, with its cascading effects on daily life, access to resources, food security and the nature of multilateral relations. Climate refugees and migration, linked to environmental disasters and extreme weather events, such as floods, heatwaves and wildfires – which are only expected to increase in the future – are compounding these threats to state and societal resilience stemming from the current climate emergency.¹

¹ Miguel A. Altieri and Clara I. Nicholls, "Agroecology: Challenges and Opportunities for Farming in the Anthropocene", in *International*

The Mediterranean in particular is recognised as a climate change and biodiversity "hotspot",² with significant risks associated with the preservation of its unique flora and fauna, as well as its rich cultural heritage and agricultural traditions. Similarly, industrial agriculture and its disruption of ecosystems threaten access to healthy and nutritious food and cultivable lands, a dynamic further aggravated by

Journal of Agriculture and Natural Resources, Vol. 47, No. 3 (2020), p. 204-215, <https://doi.org/10.7764/ijanr.v47i3.2281>.

² Paola Migliorini et al., "Agroecology in Mediterranean Europe: Genesis, State and Perspectives", in *Sustainability*, Vol. 10, No. 8 (2018), Article 2724, <https://doi.org/10.3390/su10082724>.

Andrea Di Bernardo was enrolled in a Master's Degree in Area and Global Studies for International Cooperation at the University of Turin in the academic year 2021–2022. This is a winning essay (5th place) from the 2022 IAI-University of Turin Essay Prize, an initiative launched by IAI's Italian Foreign Policy programme – in the context of the Institute's strategic partnership with the Compagnia di San Paolo Foundation – together with the Department of Historical Studies of the University of Turin, and in collaboration with the Scuola di Studi Superiori Ferdinando Rossi (SSST) and the Luigi Einaudi Foundation. Views expressed in the article are the author's alone and do not necessarily reflect those of the organising institutes or supporters.

the global implications of the Russian invasion of Ukraine that has increased food insecurity concerns across much of the Mediterranean and the Middle East.

Cooperation between governments is the only way states and societies can develop means to mitigate and adapt to the compounding challenges of the climate emergency. While the present crisis impacts a wide variety of sectors, when it comes to agriculture, one possible ingredient to improve resilience to climate change is offered by agroecology. Agroecology can be defined as the application of ecological science and principles to agricultural systems, involving various approaches and dimensions, such as environmental, economic, ethical and social aspects: albeit not widely recognised, this renders agroecology an entanglement between a movement, a science and a practice.³

In light of the European Union's (EU) commitment to climate neutrality and decarbonisation, agroecology can represent one component of a strategy to develop more sustainable forms of agricultural production in the wider Mediterranean. Given agroecology's emphasis on the protection of biodiversity and low external input-based farming, this approach can be efficiently promoted across the Mediterranean Basin, where the agricultural sector has huge potential due to the peculiar common socio-

³ Alexander Wezel et al., "Agroecology as a Science, a Movement and a Practice. A Review", in *Agronomy for Sustainable Development*, Vol. 29, No. 4 (December 2009), p. 503-515, DOI: 10.1051/agro/2009004.

cultural, bio-physical and political-economic features, thus allowing for the sharing of techniques and best practices among states and societies inhabiting the region.⁴

Given Italy's experiences and expertise in the sector of agroecology, such an approach may provide avenues for Rome to initiate and share best practices and approaches, helping to promote and spread such techniques in the wider Mediterranean as well as at the EU level.

Italian agroecology

Agroecology is by no means a recent phenomenon in Italy. One can trace its origins back to the 19th and early 20th centuries, when Pietro Cuppari (1816–1860), an agronomist professor at the University of Pisa, and Girolamo Azzi (1885–1969), a professor at the University of Perugia deemed the founder of agricultural ecology,⁵ began working in the sector. Since then, agroecology remained somewhat underappreciated until the late 1990s, when organic farming was developed, stimulating fresh interest in agroecology by international research communities.

The novelty of agroecology is that it combines key principles like diversity, synergy, efficiency and recycling in modern agricultural techniques,⁶ while

⁴ Paola Migliorini et al., "Agroecology in Mediterranean Europe", cit.

⁵ Ibid.

⁶ Charles Francis et al., "Agroecology: The Ecology of Food Systems", in *Journal of Sustainable Agriculture*, Vol. 22, No. 3 (2003), p. 99-118, DOI: 10.1300/J064v22n03_10.

also calling for crop diversification (polycultures, rotations, agroforestry systems and crop-livestock-fish integration), which are widely recognised as positive today. This strategy calls for the reintroduction of biodiversity into agroecosystems. The latter, in turn, offers several ecological advantages to farmers, such as in terms of soil fertility, pest and disease regulation, as well as pollination, helping to promote autonomy, resilience and food security.⁷

The most important aspect of agroecology is that it embraces a socio-political dimension to agriculture, advocating for social justice and the radical transformation of the corporate-controlled global food system. Agroecology techniques are closely linked to the attainment of all Sustainable Development Goals⁸ and can, directly and indirectly, contribute to improving the sustainability of global food supply chains. With the development of the Organic 3.0 model – thus making organic production mainstream – the benefits of agroecology were further promoted, helping to institutionalise organic farming and thereby contributing to rising awareness about more sustainable forms of agriculture and food production.

⁷ Miguel A. Altieri and Clara I. Nicholls, "Agroecology: Challenges and Opportunities for Farming in the Anthropocene", cit.

⁸ Millennium Institute, *The Impact of Agroecology on the Achievement of the Sustainable Development Goals (SDGs). An Integrated Scenario Analysis*, Biovision Foundation, December 2018, <https://www.agroecology-pool.org/?p=1262>.

In Italy, agroecology is deeply connected to the development of organic farming and to the territorial approach called Bio-Districts or Eco-Regions, a spatial framework allowing the implementation of the principle to consume ecologically, socially responsible produced and/or processed products as close as possible to their place of production.⁹ In 2016, the Italian Ministry of Agriculture added agroecological approaches and the experience of biodistricts to the National Action Plan for organic farming. Back then, the Italian approach to farm diversification anticipated some of the principles later included in the 2021 EU Green Deal, such as its focus on agricultural practices but also ethical and social aspects connected to the sector.¹⁰

A primary focus of agroecological action in Italy is food sovereignty, understood as an effort to save, reuse and share local seeds grown across its territory.¹¹ This involves local and national seed savers associations such as *Civiltà Contadina* (established in 1996) as well as coalitions like the Italian Rural Seed Network (*Rete*

⁹ Salvatore Basile et al., *A Comparative Analysis on Organic Districts (or Eco-Regions or Bio-Districts) in Europe*, EducEcoRegions Project, 2021, https://www.ecoregion.info/wp-content/uploads/2021/11/O1-A1_Organic_Districts_in_Europe.pdf.

¹⁰ Giuseppe Gargano et al., "The Agroecological Approach as a Model for Multifunctional Agriculture and Farming towards the European Green Deal 2030 - Some Evidence from the Italian Experience", in *Sustainability*, Vol. 13, No. 4 (2021), Article 2215, <https://doi.org/10.3390/su13042215>.

¹¹ Paola Migliorini et al., "Agroecology in Mediterranean Europe", cit.

Semi Rurali), created in 2007.¹² These organisations represent a reference point for agrobiodiversity conservation in Italy and have played important roles in connecting with and sharing best practices with other institutions in Europe and beyond.

Of late, agroecology has gathered the interest also of Italian non-governmental organisations engaged in international cooperation, such as COSPE and *Mani Tese*, which have launched sustainable agriculture projects in Italy and overseas.¹³ Meanwhile, other associations fostering the agroecology approach, such as the Slow Food movement and the AgriBioMediterraneo (ABM), have promoted the use of “slow agriculture” in Italy and abroad, helping to spread such principles and techniques further.

Benefits of agroecology

Turning to the role that agroecology can play in combating food insecurity amidst climate change and continued population growth, particular attention needs to be directed at the urban level. Indeed, 75 per cent of the population in the EU lives in urban areas,¹⁴ meaning that city-region food systems play a crucial part in meeting the challenges faced by the European food sector. In seeking to harness the full potential of agroecology in the EU, in the Mediterranean and as well as in the MENA region, it is worth taking a

¹² Ibid.

¹³ Ibid.

¹⁴ World Bank Data, *Urban Population (% of Total Population) - European Union*, <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=EU>.

closer look at individual practices that together contribute to applying an agroecological approach to farming.

A 2018 study identified a list of specific practices that can be defined as the basis of an agroecological approach,¹⁵ providing numerous benefits for food sustainability as well as the fight against climate change:

- Mixed farming systems. This approach has long been discouraged in favour of specialised agricultural farming. In Italy, 60 per cent of the national agricultural area is under specialised crop farming, 28 per cent is under specialised livestock farming and only 12 per cent under mixed farming – this is an area where improvement is required.
- Locally adapted crops and local animal breeds. In Italy, there is a huge degree of agricultural and food biodiversity, and the use of locally adapted varieties is still common because of the wealth of species, cultures and climate across its territory. In high-quality production, Italy is a leader in Europe, having the highest number of geographical origin food product labels awarded by the EU.
- Soil fertility enhancement and climate change mitigation, through an increase in the use of longer crop rotations, cover crops and green manures, crop residue management and conservation tillage.
- Landscape conservation and terracing. These practices are gradually being rediscovered due to the particular features of the territory: Italy is composed of hills for 42 per cent and of mountainous territory for 35 per

¹⁵ Paola Migliorini et al., “Agroecology in Mediterranean Europe”, cit.

cent, and terraces are still used today in olive and vineyard cultivation along some coastal areas. Such practices are supported, for example, through Common Agricultural Policy (CAP) Regional Development Programmes and may be promoted more broadly to improve crop yields while preserving biodiversity.

- Agroforestry and agro-silvopastoral systems involving trees and animal farming for cultivation, which were traditional land practices in Greece and to a minor extent in Italy, but today are not applied in farms due to extensification/intensification processes of production imposed by socio-economic changes.¹⁶

However, agroecology goes far beyond specific agricultural practices as the ones mentioned above, being instead intimately linked to local contexts, issues and opportunities.¹⁷ This explains why agroecology is so popular in Latin America, where it is embedded as an alternative to the neoliberal approach and the injustices of international trade and extractivist practices. Instead, agroecology gives priority to food sovereignty by strengthening local autonomy, markets, production and consumption, as well as farmer-to-farmer networks that promote agroecological innovations and ideas.¹⁸

¹⁶ Vasilios P. Papanastasis et al., "Traditional Agroforestry Systems and Their Evolution in Greece", in Antonio Rigueiro-Rodríguez, Jim McAdam and María Rosa Mosquera-Losada (eds), *Agroforestry in Europe. Current Status and Future Prospects*, Cham, Springer, 2009, p. 89-109.

¹⁷ FAO website: *Agroecology Knowledge Hub: Overview*, <https://www.fao.org/agroecology/overview/en>.

¹⁸ Miguel A. Altieri and Víctor Manuel Toledo,

Unleashing agroecology's true potential

Further action is needed to unleash the true potential of agroecology. To this end, in 2019, the Food and Agriculture Organization (FAO) and several partners developed the Tool for Agroecology Performance Evaluation (TAPE): a comprehensive tool that may serve as a framework for governments and public actors in the adaptation and re-design of research and development programmes, rural advisory services and extension programmes to promote a truly sustainable agriculture.¹⁹

Against this backdrop, in European and Southern Mediterranean countries, governments should deepen cooperation with all stakeholders to protect and enhance traditional sustainable agricultural practices by:

- developing their agricultural, environmental, food and public health policies accordingly;
- addressing technical issues, including fostering diversification of production and food systems;
- integrating biodiversity and habitat conservation into farming systems, as in the case of land conservation and terracing applied in Italy and Greece;
- addressing issues of economic exploitation as well as problems of

"The Agroecological Revolution in Latin America: Rescuing Nature, Ensuring Food Sovereignty and Empowering Peasants", in *The Journal of Peasant Studies*, Vol. 38, No. 3 (2011), p. 587-612, <http://agroeco.org/wp-content/uploads/2009/11/Altieri-and-Toledo-JPS-38.3-2011.pdf>.

¹⁹ FAO website: *Agroecology Knowledge Hub: Tool for Agroecology Performance Evaluation (TAPE)*, <https://www.fao.org/agroecology/tools-tape/en>.

overconsumption and waste in food chains, shifting the focus onto those working in agriculture and the food industry;

- enhancing advice, training, education and information services for practitioners, researchers and farmers.

In European and Southern Mediterranean countries, this could be done by enforcing and implementing the new CAP, the European Green Deal and related strategies.

For its part, Italy should increase and maximise organic production, thus overcoming the approach centred on biodistricts that is no longer sufficient, as well as enhance sustainable food procurement for public services. The policymaking process could benefit from FAO's TAPE in the design, implementation and monitoring of public policies, programmes and projects, which are an important enabler of agroecology. Engagement should be sought with a broad and differentiated network of stakeholders and actors across the public and private sectors at the national, regional and international levels, as well as with European institutions whose funding and political support can go a long way in further extending the benefits of agroecology. Public dialogue will also be key, as well as the sharing of best practices and mutual learning between countries and groups of experts and associations across Europe, the Mediterranean and beyond.

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Via dei Montecatini, 17

I-00186 Rome, Italy

Tel. +39 066976831

iai@iai.it

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