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EVOLUTION OF LAND USE IN ORGANIC AGRICULTURE (2013-2023)

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Abstract. *The paper "Evolution of land use in organic agriculture (2013–2023)" investigates the transformations that have occurred in the allocation and management of certified organic agricultural areas, in a decade marked by the transition to sustainable practices and the consolidation of demand for organic products, both on the domestic and European markets. The study aims to highlight the dynamics of organically cultivated areas, the structure of dominant crops, the regional distribution and the impact of agricultural policies on land use in this sector. The research is based on the analysis of statistical data from sectoral reports and information provided by certification bodies. The results obtained indicate a trend of progressive expansion of organically cultivated areas, especially for field crops (cereals, legumes), permanent grasslands and fodder plants, along with an increased interest in niche sectors, such as fruits, vegetables and medicinal plants. The conclusions of the paper emphasize the need for a coherent strategy for the expansion of organic agriculture, which includes predictable financial support, specialized professional training, digitalization of product traceability, and stimulation of cooperation between farmers. Agricultural and environmental policies must recognise and fully exploit the potential of organic farming in order to achieve sustainability and environmental protection objectives.*

Keywords*: organic agriculture, land use, sustainability, certification*

INTRODUCTION

Organic agriculture is a growing branch of global agriculture, responding to increasingly stringent requirements regarding environmental sustainability and food safety. Organic agriculture is in a continuous dynamic, shaped by a series of major trends and influenced by socio-economic, political and environmental factors. These developments have significant implications for agricultural and environmental policies, both globally and nationally. The role of this agricultural system is to produce cleaner food, more suitable for the metabolism of the human body, but in full correlation with the conservation and development of the environment, in respect for nature and its laws. (MORNA ANAMARIA, 2010)

Organic agriculture is an agricultural production system that aims to support the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, instead of using inputs with adverse effects, such as synthetic fertilizers, pesticides, genetically modified organisms (GMOs) and antibiotics in animal husbandry. Organic agriculture combines tradition, innovation and science to benefit the environment and to promote equitable relationships and a good quality of life for all involved.

Organic farming has gained a globally popularity due to concerns about environmental health, food safety and agricultural sustainability. This farming method avoids the use of synthetic chemicals, pesticides and fertilizers, focusing on ecological practices that promote biodiversity and soil health. (MATEO-SÎRB *et al.*, 2024)

Organic farming contributes to biodiversity conservation, improving soil quality and reducing greenhouse gas emissions, having also a positive impact on the environment. The main purpose of organic farming is to optimize the health and productivity of the interdependent soil communities of plants, animals and people. (ADAMOV *et al.*, 2008)

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Compared to conventional agriculture, organic farming is considered to be more efficient and effective, mainly due to the reduced use of chemical fertilizers and fossil fuels. Organic farming is also considered to be a climate-resilient agricultural system, as it promotes proper management of soil, water, biodiversity and local knowledge, acting as a good option for climate change adaptation. (RAM CHANDRA KHANAL, 2009)

The roots of organic farming can be traced back to the early 20th century, as a reaction to the rapid industrialization of agriculture and growing concerns about the impact of chemical fertilizers and pesticides on soil, plants, animals, and human health. Organic products are considered to be those agricultural products that are produced, preserved, or processed without the use of synthetic chemicals. (JITĂREANU *et al.*, 2003)

In organic farming, one of the biggest obstacles is the cost and complexity of the certification process. The control is ensured at all stages of production, storage, transformation and marketing, all operators being subject to this permanent control officially recognized and supervised by the state. The identification of organic products (ecological or biological) takes place thanks to precise label rules, intended to provide the consumer with the best possible guarantee of their origin. (JURJESCU *et al.*, 2021)

Organic farming is distinguished by the following key characteristics:

● *Soil health*: The priority is to maintain and improve the biological fertility of the soil through crop rotation, the use of green manures, compost, well-fermented manure and techniques to minimize soil tillage.

● *Biodiversity*: Promoting genetic diversity of crops and animal breeds, as well as biodiversity on and around the farm (through the creation of habitats, hedges, buffer zones).

● *Exclusion of synthetic inputs:* Prohibition of the use of synthetic chemical fertilizers, synthetic pesticides, synthetic herbicides and genetically modified organisms (GMOs).

● *Animal welfare*: Ensuring living conditions that allow for natural animal behaviors, access to pasture (when possible), low animal densities and prohibition of the preventive use of antibiotics.

● *Pest and disease management*: Preventive approach through crop rotation, selection of resistant varieties, creation of favorable conditions for natural predators and use of biological, mechanical and physical control methods.

● *Weed management*: Mechanical control (ploughing, harrowing), mulching, crop rotation and use of cover crops.

● *Natural cycles*: Harnessing natural nutrient and water cycles, with an emphasis on closed systems where resources are regenerated within the farm as much as possible.

● Integrity and transparency: The organic certification system ensures that products meet organic standards throughout the entire supply chain, from farm to consumer.

The complexity of organic agriculture derives from its systemic approach and the need to understand and work with natural processes, instead of simplifying them with synthetic inputs. This involves:

♦ *Deep ecological knowledge*: Organic farmers must have a deep understanding of soil ecology, plant-pest-predator interactions, nutrient cycling, and the role of biodiversity.

♦ *Adaptive management*: There are no one-size-fits-all recipes; practices must be adapted to specific local soil, climate, and ecosystem conditions. This requires careful observation, experimentation, and continuous learning.

♦ *Long-term planning*: Building soil health and creating a balanced agricultural ecosystem are long-term processes that require strategic vision and patience.

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♦ *Integrated pest and disease management*: In the absence of synthetic pesticides, pest and disease control relies on a combination of preventive methods (crop rotation, resistant varieties, plant health) and biological or mechanical interventions, which require careful planning and an understanding of the life cycles of organisms.

♦ *Integration of diversity*: Effective management of complex crop rotations, intercropping, and integration with livestock (where applicable) requires careful coordination of the various components of the farm.

♦ *Certification and regulation*: Compliance with organic certification standards involves rigorous documentation and inspection processes, adding a level of administrative complexity.

Organic farming is practiced on approximately 1% of the global agricultural land area, and interest in this type of practice is constantly growing. Many consider it a more environmentally friendly alternative to conventional agriculture, as it does not allow the use of soluble mineral fertilizers, herbicides and synthetic pesticides. (LORENZ *et al.*, 2016)

During the period analyzed 2013-2023, organically cultivated areas increased from 43.1 million hectares in 2013, to 43.7 million hectares in 2014, to 50.9 million hectares in 2015, to 57.8 million hectares in 2016, to 69.8 million hectares in 2017, to 71.5 million hectares in 2018, to 72.3 million hectares in 2019, to 74.9 million hectares in 2020, to 76.4 million hectares in 2021, to 96.4 million hectares in 2022, reaching over 98.9 million hectares in 2023. During the analyzed period, Oceania is the region with the largest area of land cultivated organically. (WILLER *et al.*, 2015; WILLER *et al.*, 2016; WILLER *et al.*, 2017; WILLER *et al.*, 2018; WILLER *et al.*, 2019; WILLER *et al.*, 2020; WILLER *et al.*, 2021; WILLER *et al.*, 2022; WILLER *et al.*, 2023; WILLER *et al.*, 2024; WILLER *et al.*, 2025)

In 2023, over 98.9 million hectares of organic crops will be grown globally on over 4.3 million farms, compared to 43.0 million hectares in 2013 on approximately 2.0 million farms. (WILLER *et al.*, 2015; WILLER *et al.*, 2025)

In 2023, the continent with the largest organically cultivated area is Oceania, at over 53.1 million ha, up by over 35.8 million ha compared to 2013, followed by Europe with 19.4 million ha, up by over 7.9 hectares compared to 2013, Latin America – 10.3 million ha, up by over 3.7 million ha compared to 2013, Asia – 9.1 million ha, up by over 5.7 million ha compared to 2013, North America – 3.3 million ha, up by 301,545 hectares compared to 2013 and Africa – 3.4 million ha, up by over 2.1 million ha compared to 2013. (WILLER *et al.*, 2015; WILLER *et al.*, 2025) (table 1). The situation of organic agriculture on the continents, in 2013 and in 2023 is presented in Figure 1. (WILLER *et al.*, 2015; WILLER *et al.*, 2025) Also, the distribution of organic agriculture in the world, in 2013 and in 2023 is presented in figure 2. (WILLER *et al.*, 2015; WILLER *et al.*, 2025)

Table 1

Organically cultivated area and number of organic farms by continent

Continent	Organic agricultural land (ha)		Producers (numbers)	
	2012	2022	2012	2022
Africa	1.145.827	2.735.006	572.862	975.334
Asia	3.217.867	8.830.990	684.873	2.728.678
Europa	11.171.413	18.450.355	321.625	480.135
America Latină	6.836.498	9.537.387	316.583	270.217
America de Nord	3.012.354	3.627.818	16.470	23..948
Australia/Oceania	12.164.316	53.194.639	14.605	24466
TOTAL	**37.544.909**	**96.376.196**	**1.927.018**	**4.502.778**

Source: Willer *et al.*, 2015; Willer *et al.*, 2025

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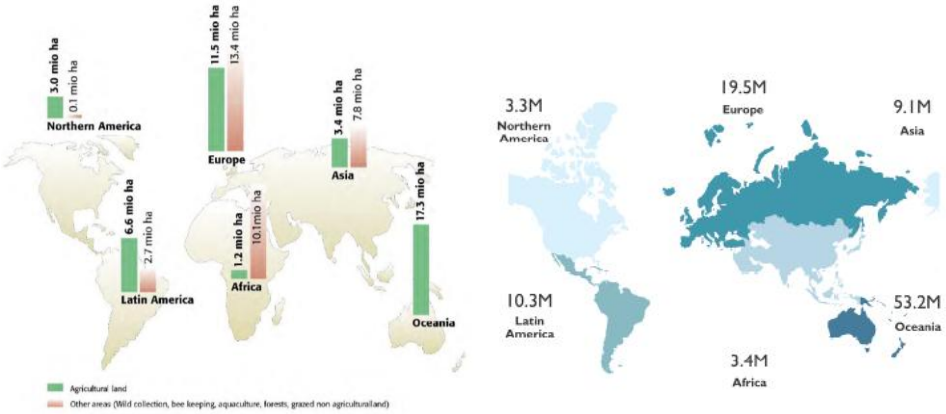

Figure 1. Organic farming in the world (M=millions) (2013, 2023)
Source: Willer *et al.*, 2015; Willer *et al.*, 2025

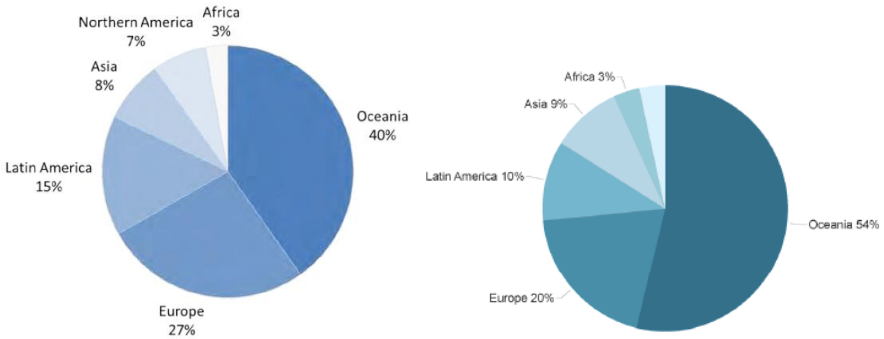

Figure 2. Distribution of organic agriculture in the world, by region (2013, 2023)
Source: Willer *et al.*, 2015; Willer *et al.*, 2025

The evolution of agricultural areas, especially those dedicated to organic farming, is the result of the complex interaction of agricultural policies, market demand, the availability of knowledge and infrastructure, as well as farmers' perceptions and decisions. A deep understanding of these factors and how they influence each other is essential to develop effective strategies to promote organic farming and achieve agricultural sustainability and environmental protection objectives.

The global potential of organic farming is vast and aligns with global trends towards sustainability and health. Overcoming existing challenges through appropriate support policies, investment in research and infrastructure, consumer education and facilitating access to markets can unlock this potential and contribute to a more resilient, healthy and environmentally friendly global food system.

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MATERIAL AND METHODS

Organic agriculture is gaining ground globally, it represents a sustainable and ecological approach to food production. Statistical materials show that organic agriculture is practiced in many countries around the world and is continuously growing. This paper is based on a content analysis of statistical materials from the period 2015-2025. (WILLER *et al.*, 2015; WILLER *et al.*, 2016; WILLER *et al.*, 2017; WILLER *et al.*, 2018; WILLER *et al.*, 2019; WILLER *et al.*, 2020; WILLER *et al.*, 2021; WILLER *et al.*, 2022; WILLER *et al.*, 2023; WILLER *et al.*, 2024; WILLER *et al.*, 2025) The research method was quantitative, based on the analysis of data series from the period 2013–2023, correlated with legislative, economic and climatic changes in these years. To analyze the evolution of land use in organic agriculture, statistical data and reports published by international organizations such as: FiBL (Institute for Research on Organic Agriculture) – through the annual publications "The World of Organic Agriculture", FAO (Food and Agriculture Organization of the United Nations), Eurostat – for European regional data, IFOAM (International Federation of Organic Agriculture Movements). The developments were analyzed at a global level, focusing on the total area certified organically, the land use categories (permanent grassland, arable land, perennial crops), as well as their geographical distribution.

RESULTS AND DISCUSSIONS

Globally, the area under organic farming increased from approximately 43.1 million ha in 2013 to over 98.8 million ha in 2023, representing an increase of over 55 million ha. The largest expansion occurred in Oceania (especially Australia), Europe and Latin America. Oceania holds over 50% of the total global organic area. (WILLER *et al.*, 2015; WILLER *et al.*, 2025)

In 2013, globally, organic arable land constituted 17.7% of the world's organic agricultural land, totaling almost 7.7 million hectares. Europe accounts for over 59% of the arable land, followed by North America (17%) and Asia (16%). (table 2) (WILLER *et al.*, 2015)

Table 2

Organic agricultural land by the main agricultural use categories and continents (ha) (2013)

Land use	Africa	Asia	Europe	Latin America	Northern America	Oceania	Total
Agricultural land, no details	340,301	607,773	226,394	721,672	-	435,731	2,328,106
Arable crops	237,219	1,253,249	4,599,369	209,335	1,321,654	38,679	7,659,506
Cropland, no details	8,002	1,086,194	72,187	484,955	388,912	48,351	2,088,601
Other agricultural land	9,518	62,970	437,939	7,552	219,957	-	737,936
Permanent crops	567,634	388,077	1,296,073	845,020	67,089	70,950	3,234,842
Permanent grassland	64,415	27,676	4,828,810	4,343,102	1,050,097	16,728,022	27,042,122
Total	**1,227,088**	**3,425,939**	**11,460,773**	**6,611,636**	**3,047,710**	**17,321,733**	**43,091,113**

Source: Willer *et al.*, 2015

Figure 3 shows the distribution of the main types of use of organic agricultural land by region in 2013.. (WILLER *et al.*, 2015)

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Table 3 presents the use of land and crop categories by continent in 2023, showing that approximately 70% of organic agricultural land is used as permanent pasture/meadow, 16% is cultivated with arable crops, and approximately 7% with permanent crops. (WILLER *et al.*, 2025) In 2023, the cultivated area was 22.9 million hectares, which represents less than a quarter of the organic agricultural land, an area consisting of 16.2 million hectares of arable land and 6.7 million hectares of permanent crops. (WILLER *et al.*, 2025) Looking at the land at continental level, it is observed that each continent has its own specificity.

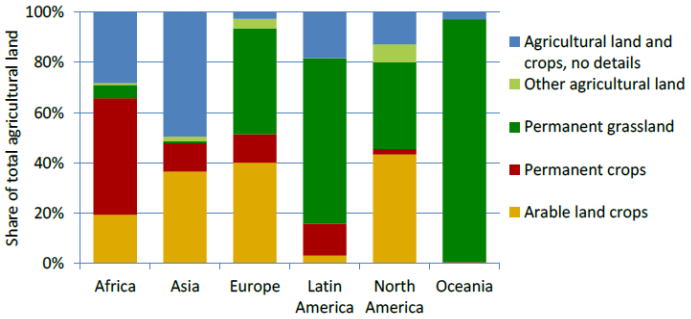

Figure 3. Distribution of the main types of organic agricultural land use by region (2013)
Source: Willer *et al.*, 2015

Table 3

Organic agricultural land by the main agricultural use categories and continents (ha) (2023)

Land use	Africa	Asia	Europe	Latin America	Northern America	Oceania	Total
Arable land crops	1,374.877	4,040,433	8,446,680	617,986	1,623,433	51,472	16,154,882
Permanent crops	1,936.482	1,129,179	2,461,340	853,823	272,312	42,071	6,695,208
Permanent grassland	16.460	6,185	7,845,128	7,586,327	517,675	52,540,881	68,512,656
Total	**3,403.319**	**9,137,495**	**19,457,600**	**10,347,833**	**3,349,255**	**53,178,651**	**98,865,120**

Source: Willer *et al.*, 2025

In 2023, globally, organic arable land accounted for 16.3% of global organic agricultural land and 1.2% of global cultivated arable land, totaling nearly 16.2 million hectares. Europe accounts for over 52% of arable land, followed by Asia (25%) and North America (10%). (WILLER *et al.*, 2025)

Permanent crops accounted for over 6.7 million hectares, which is 3.8% of the world's permanent cropland. The largest share of permanent cropland was in Europe (nearly 2.5 million hectares), followed by Africa (over 1.9 million hectares) and Asia (nearly 1.1 million hectares). (WILLER *et al.*, 2025)

Figure 4 shows the distribution of the main types of use of organic agricultural land by region in 2023. (WILLER *et al.*, 2025)

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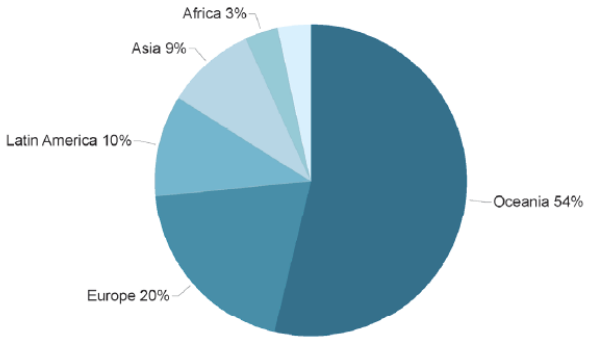

Figure 4. Distribution of the main types of organic agricultural land use by region (2023)
Source: Willer *et al.*, 2025

In 2023, the largest share of organic agricultural land by region was in Oceania (14.1%), followed by Europe with 3.9% and Latin America with 1.6%. In the European Union, the organic share of total agricultural land was 10.9%. In the other regions, the share is less than 1%. In 2023, the area of organic agricultural land increased in all regions except North America and Oceania. (WILLER *et al.*, 2025)

CONCLUSIONS

In the face of growing concerns about sustainability and the environment, the importance of organic agriculture is becoming increasingly evident in: combating climate change, conserving biodiversity, protecting human health, protecting water and soil quality, and promoting the sustainability of food systems. The complexity of organic agriculture is a reflection of its holistic approach and commitment to working in harmony with nature. Its importance in the current context is undeniable, offering viable solutions to some of the most pressing sustainability and environmental issues.

The importance of organic agriculture in the current context of sustainability and environmental concerns are significant and interconnected. This is not just a method of agricultural production, but a holistic system that addresses some of the most pressing challenges of our time.

The period 2013–2023 was one of significant growth for organic agriculture globally, also reflected in the expansion of the areas used. Grasslands remain dominant, but there is a diversification of crops and an expansion of organic arable land. Recognizing and supporting organic farming through appropriate policies, research and education are essential to build a more sustainable and healthier agricultural and food system for the future.

Globally, the evolution of land use in organic farming between 2013 and 2023 was marked by significant trends and influenced by a number of key factors, such as:

► **Significant global trends**:

- *Steady growth in organic area*: Globally, there has been a steady upward trend in the total area devoted to organic farming. This growth has been driven by a growing demand for organic products and a growing awareness of the negative impact of conventional farming on the environment and health.

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- *Land use diversification*: While pastures and extensive crops (cereals, fodder) initially dominated organic areas, there has been a diversification towards higher value-added crops such as organic fruits, vegetables, coffee, cocoa and cotton.

- *Regional concentration*: Oceania (especially Australia) continued to have the largest organic area, followed by Europe and Latin America. However, the growth rate was more pronounced in regions such as Europe and Africa in the latter years of the period under review.

- *Increase in the number of organic farmers*: Along with the expansion of the area, the number of farmers adopting organic farming practices has also increased, although their distribution is uneven globally, with a significant concentration in countries such as India and Ethiopia.

►**Key factors influencing the global trend**:

- *Consumer demand*: The growing demand for healthy, pesticide-free and sustainably produced foods has been the main driver of the expansion of organic farming.

- *Government policies and support schemes*: The implementation of policies to support organic farming, including subsidies, conversion programs and clear regulations, has played a crucial role in many countries.

- *Premium prices for organic products*: The higher prices obtained for organic products have provided an economic incentive for farmers to adopt these practices.

- *Awareness of the impact of conventional agriculture*: Concerns about the negative impact of pesticides, synthetic fertilizers and intensive agricultural practices on the environment, biodiversity and human health have contributed to the growing interest in organic alternatives.

- *Development of markets and supply chains*: As demand has increased, infrastructures for processing, distributing and marketing organic products have developed, facilitating access for consumers and providing opportunities for farmers.

- *Research and innovation*: The development of effective organic cultivation techniques, adapted varieties and alternative methods of pest and disease management have contributed to the economic viability of organic farms.

In conclusion, organic farming represents a strategic direction for a more sustainable and resilient agricultural system. Current trends point to continued growth and the drivers underline the importance of an integrated approach, involving consumers, producers and policy makers. Agricultural and environmental policies must recognise and fully exploit the potential of organic farming to achieve sustainability and environmental protection objectives.

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