

Organic Farming: Ecological Foundations, System Performance, and Sustainable Development Implications

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Abstract: *Organic farming has developed as a globally recognized alternative to chemically intensive agricultural systems. It emphasizes reduced reliance on synthetic agrochemicals, biodiversity conservation, soil biological activity, and nutrient recycling, being closely aligned with ecological principles. This review synthesizes scholarly literature to critically assess the environmental, economic, agronomic, and social aspects of organic agriculture. Evidence indicates that organic approaches can improve soil organic carbon, sustain biodiversity, reduce agrochemical pollution, and support long-term agroecosystem resilience. However, the average yields can be slightly lower than those of conventional systems. Organic farming offers environmental services and potential climate resilience, contributing to broader sustainability. This study presents a multidimensional evaluation framework that integrates ecological integrity, socioeconomic viability, and long-term productivity while also considering short-term yield.*

Keywords: Sustainable development, Organic agriculture, agroecology, biodiversity conservation, soil fertility, ecological resilience, carbon sequestration