

# International Conference on Nurturing Sustainability through Innovations in Science and Technology for Global Welfare



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## Advancing Sustainable Agriculture: A Comprehensive Review of Practices, Technologies, and Policy Interventions for Food Security and Nutrition

Sustainable agriculture is essential for ensuring long-term food security and nutrition while preserving environmental resources. This review provides the insights on the critical integration of agroecological practices, soil health management, innovative technologies, and policy interventions in advancing sustainable agriculture. Agroecological practices, grounded in the principles of ecological balance and biodiversity, encompass methods such as organic farming, agroforestry, and integrated pest management. These practices promote resilience and reduce reliance on external inputs. Soil health management is another fundamental of sustainable agriculture, emphasizing practices like cover cropping, crop rotation, and organic amendments to enhance soil fertility, improve crop productivity, and increase nutrient content. Emerging technologies, including precision farming, hydroponics, and vertical farming, offer innovative solutions for sustainable food production, optimizing resource use and minimizing environmental impacts. Policy interventions play an important role in supporting sustainable agricultural practices by providing frameworks and incentives that encourage adoption and scaling. Effective policies can drive positive outcomes in food security, nutrition, and environmental sustainability. The review further highlights the interconnections and synergies between these elements, demonstrating how their integration can lead to more strong and resilient agricultural systems.

Key words: Sustainable agriculture, Agroecological practices, Soil health management, Innovative technologies, Policy interventions

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