

Organic farming and the SDGs: Pathways to sustainable agriculture in India

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Organic farming has emerged as a global trend in sustainable agriculture, offering pathways to healthier food systems, environmental protection, and rural prosperity. India, with the world's largest number of organic farmers and a steadily expanding certified area, is uniquely positioned to lead this transformation. This article discusses the trajectory of organic farming in India and worldwide, highlighting its role in advancing sustainable development and its strong linkage with the United Nations' Sustainable Development Goals (SDGs). While organic agriculture acts as a multi-SDG accelerator, challenges such as cost competitiveness, perishability, pest management, and knowledge intensity continue to limit its scalability. The article critically provides both the promise and the constraints of organic systems. Further, overcoming these hurdles through unified certification standards, farmer training, digital traceability, and supportive policy frameworks is essential.

Keywords: Organic standards, Pest management, Sustainable development goals, Sustainability

AGRICULTURE is a vital component of sustainable development and plays a central role in SDG-II (Sustainable Development Goals) of the 2030 Sustainable Development Agenda, which seeks to eradicate hunger. Additionally, the agricultural sector is interconnected with all other SDGs to varying degrees. However, the UN-SDGs may not be achieved with the prevailing agricultural practices. A transformation of existing practices of agriculture and the agri-food system is highly necessary to achieve the SDGs by 2030. Small and marginal farmers can play a significant role in this achievement, as stated by FAO. It is a well-known fact that the Green Revolution focused on enhancing the production of food for the people in the country with chemical pesticides and fertiliser application to boost yields in the country. This helped the country to become self-sufficient in food grains production and helped the farmers in increasing their livelihood.

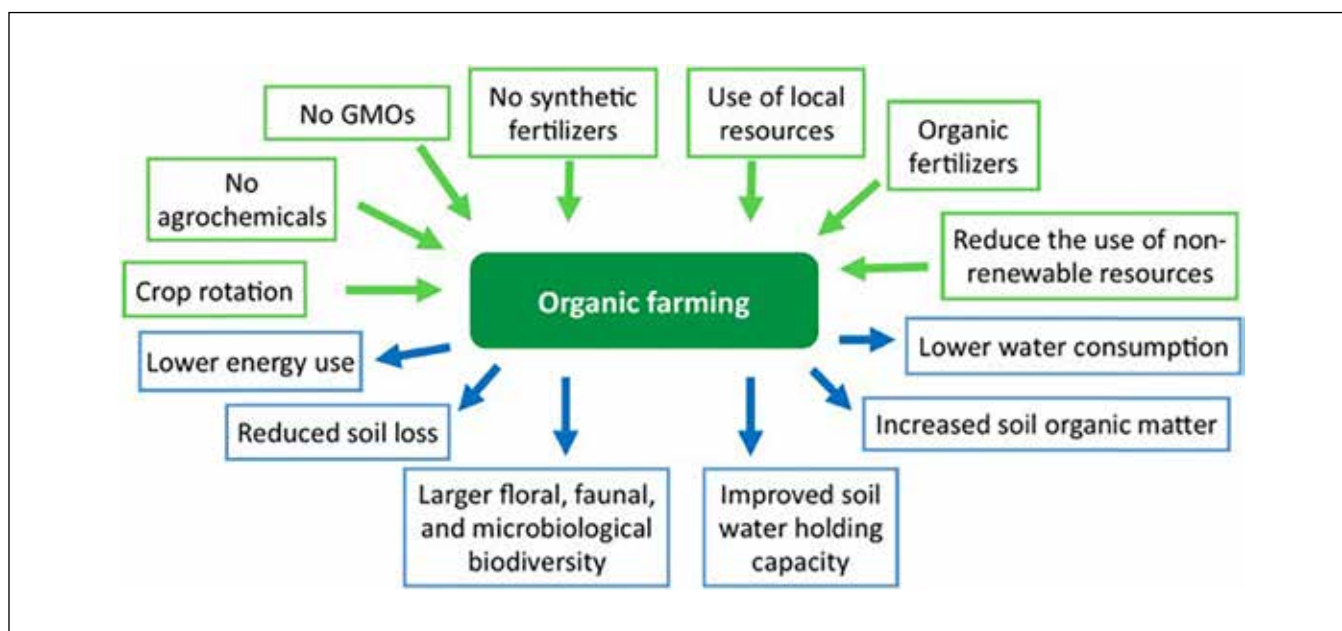
The current agro-innovations and farming system is primarily driven by high-yielding seeds, agrochemicals, monocropping systems, etc. which led to imbalanced and unsustainable conditions, causing adverse effects on the environment. The cost associated with maintaining environmental quality is unlikely to be sustainable in the future due to externalities affecting the environment and ecosystems. Therefore, it is very crucial to look for a practice that is resilient and compatible with the

ecosystem. Organic farming may be one of those, and a widely recognised practice can be considered feasible. According to the policies of the United Nations SDGs, several member states and various organizations have endorsed the Zero Hunger challenge, which has been documented as it calls for.

It is a fact that enhancing sustainable development through agriculture has been a trend and can be achieved through 'organic farming'. According to many researchers, the externalities of climate change can be reduced with organic farming, which makes farming resilient to the zigzag pattern of temperature, calamities like droughts, and also manages soil erosion. It underpins sustainability and eco-friendly management practices, conservation efforts, and restoration activities.

Organic farming trend in India and worldwide

As per the recent FiBL survey, >96 million hectare (mha) agricultural area is operated in an organic way by 4.5 million producers of 188 countries across the globe. Though the production share (>1.6%) is still modest at the world's total agricultural area, India possesses a considerable capacity to generate a variety of organic produces owing to its diverse agro-climatic conditions. In various regions of the country, the longstanding tradition of organic farming serves as a beneficial asset. India stands out as a global powerhouse in organic



Organic farming and its effects (Source: Ashoka et al. 2023)

agriculture. Organic farming in India is more than a production system, it is a development strategy that directly advances the United Nations' SDGs. With India hosting the world's largest number of organic farmers and steadily expanding its certified area, organic agriculture offers a unique opportunity to link food security, health, climate resilience, and rural prosperity under one framework. It has the world's largest number of certified organic producers, over 2.48 million in 2022, far exceeding the totals of any other country. In terms of certified area, India ranks among the top five countries globally, with around 4.7 mha under organic management. The diversity of its organic sector, from cotton and tea to spices and millets, contributes notably to both domestic markets and international exports, making India a regional leader in Asia's organic movement.

Sustainable development through organic farming

Agriculture plays a crucial role in advancing all 17 SDGs either directly or indirectly, as food security is fundamental to poverty reduction, health, education, and gender equity. Sustainable farming practices ensure sufficient, safe, and affordable food for all, supporting good nutrition, which underpins learning and well-being. By promoting gender equity and fair land access, agricultural productivity can be increased, contributing to economic growth and poverty alleviation. Organic farming specifically reduces dependence on fossil fuels and chemicals, protects water resources, and promotes healthier ecosystems. It fosters rural livelihoods, builds resilience to climate change, and encourages innovation in sustainable farming systems such as agroforestry, integrated pest management, aquaponics, and hydroponics. These practices help conserve water, soil, and biodiversity while reducing environmental pollution. However, organic farming faces challenges, including higher labour and input costs, longer

production cycles, and generally lower yields compared to conventional farming, which can affect its profitability and scalability. Despite these limitations, organic farming's holistic approach supports multiple SDG targets by enhancing ecological balance, food safety, and social equity, making it a vital component of sustainable agricultural development strategies.

Challenges and limitations to achieving sustainability through organic farming

The government's strong commitments and innovations to advancing organic and natural farming through policy initiatives like Paramparagat Krishi Vikas Yojana (PKVY), Mission Organic Value Chain Development for North Eastern Region (MOVCDENR) and National Mission on Natural Farming (NMNF). However, the sector's outcomes remain constrained by certain structural bottlenecks due to regulatory and market ecosystem, fragmented value chains, export dependency, and low domestic demand that require coordinated policy attention for organic farming expansion and sustainability. Many researchers reported that organic producers face a distinct cost structure compared to conventional farmers. While they spend less on purchased chemical inputs, they incur significantly higher expenses on labour, feed, and management practices. Farming organically demands greater effort, knowledge, and systems-based approaches to fertility, weed, and pest control, rather than reliance on off-farm inputs. Organic products, despite being praised for their health and environmental benefits, are more vulnerable to deterioration. Shorter shelf life, sensitivity to temperature variations during shipping, and the need for faster market access make organic fruits, vegetables, and meats particularly challenging to handle. Pest infestations remain another major issue. While conventional farming relies on synthetic pesticides, organic systems restrict their use, requiring farmers to

Table 1. Linkage between organic farming and SDGs

SDGs	Relevance of organic farming
I No Poverty	Reduces input costs, stabilises farm incomes, and strengthens rural livelihoods through premium markets.
II Zero Hunger	Enhances soil fertility, promotes nutrient-rich crops, and supports long-term food and nutrition security.
III Good Health and Well-being	Eliminates toxic pesticide exposure for farmers and consumers; promotes safer food systems.
IV Quality Education	Sustainable farming knowledge dissemination empowers farmers with skills for organic techniques, fostering education in rural areas.
V Gender Equality	Encourages women's participation and leadership in agriculture, facilitating equal access to resources and markets.
VI Clean Water and Sanitation	Reduces chemical runoff, prevents nitrate leaching, and improves water retention in soils.
VII Affordable and Clean Energy	Emphasises renewable energy use and reduces reliance on fossil-fuel based inputs.
VIII Decent Work and Economic Growth	Generates green jobs in organic input production, certification, marketing, and processing.
IX Industry, Innovation and Infrastructure	Growth of organic sector stimulates innovation in bio-inputs, certification technologies, and supply chain infrastructure.
X Reduced Inequalities	Promoting organic farming among smallholder and marginalised farmers helps reduce economic inequalities.
XI Sustainable Cities and Communities	Organic food provision supports sustainable urban food systems and healthier cities.
XII Responsible Consumption and Production	Encourages circular economy practices, biomass recycling, reduced chemical use, and traceable supply chains.
XIII Climate Action	Boosts carbon sequestration, reduces emissions from synthetic fertilisers, and enhances climate resilience.
XIV Life Below Water	Prevents agricultural runoff and eutrophication, protecting aquatic ecosystems.
XV Life on Land	Improves biodiversity, enhances soil health, prevents land degradation, and supports agro-ecosystems.
XVI Peace, Justice and Strong Institutions	Transparent certification and fair trade in organic agriculture build trust and social cohesion.
XVII Partnerships for the Goals	Strengthens partnerships through certification equivalence, export collaboration, and multi-stakeholder value chains.

Source: WHO, FAO

adopt ecological pest management strategies that are often labour-intensive and knowledge-driven.

Policy imperatives to overcome challenges in organic farming

To overcome the challenges faced by organic farming and achieve sustainability, India must prioritise a set of policy imperatives that unify certification systems, strengthen infrastructure, and empower farmers. A Unified Organic Framework under 'One Nation, One Standard' would harmonise NPOP (National Programme for Organic Production) and PGS (Participatory Guarantee System), reduce duplication, and provide a single national logo to build consumer trust. Investments in digital traceability platforms and cold-chain logistics are essential to address perishability and ensure transparency from farm to market. At the same time, scaling up research and extension services for bio-pesticides, soil health, and ecological pest management will reduce reliance on synthetic inputs. Farmer-Producer Organisations (FPOs) and cooperatives should be supported to lower certification costs and improve market access, while branding initiatives can enhance domestic demand and export competitiveness. Financial incentives, including subsidies for certification and eco-friendly inputs, coupled with integration of organic indicators into India's SDG monitoring

framework, will ensure that organic farming becomes a pillar of sustainable agriculture, climate resilience, and rural prosperity.

SUMMARY

Organic farming is a multi-SDG accelerator that offers clear pathways to sustainability in India, yet it continues to face hurdles in cost competitiveness, perishability, pest management, and knowledge intensity. India's experiences from Sikkim's pioneering full organic transition to Andhra Pradesh's large-scale natural farming clusters demonstrate both the promise and the challenges of scaling organic systems. Overcoming these barriers through unified standards, farmer training, and supportive policies may be critical in realising the full potential of organic farming. By aligning certification, market development, and farmer empowerment under a Unified Organic Framework, India can position itself as a leader in sustainable agriculture across the globe. The vision of 'One Nation, One Organic Standard' is not merely a regulatory reform; but a strategic enabler of health, climate resilience, sustainable agricultural growth and rural prosperity in India.

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