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"A STUDY ON THE SUSTAINABLE AGRICULTURAL PRACTICES AND FOOD SECURITY IN INDIA"

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ABSTRACT

Agriculture has historically been the backbone of the Indian economy, providing livelihood to over half the population and ensuring national food availability. While the Green Revolution transformed India from a food-deficit nation to one capable of self-sufficiency, excessive reliance on chemical inputs, monocropping, and groundwater exploitation has created serious environmental and socio-economic imbalances that threaten long-term food security. This article undertakes a critical socio-legal analysis of the relationship between sustainable agricultural practices and food security in India. It examines the constitutional and statutory frameworks—including the National Food Security Act 2013, the National Mission for Sustainable Agriculture, and allied environmental legislation—and evaluates their effectiveness in integrating sustainability with food security objectives. Drawing on international frameworks such as the UN Sustainable Development Goals, the Paris Agreement, and comparative models from the European Union and Argentina, the article identifies persistent structural barriers including fragmented landholdings, inadequate credit, certification burdens, market failures, and governance deficits. It concludes that India's future food security is contingent on a systemic shift from a production-centric to a sustainability-oriented agricultural paradigm, supported by comprehensive legal reform, inclusive policy design, and coordinated institutional action.

Keywords: *Sustainable agriculture, food security, National Food Security Act 2013, National Mission for Sustainable Agriculture, Green Revolution, organic farming, Zero Budget Natural Farming, socio-legal analysis, agricultural law, India*

I. INTRODUCTION

Sustainable agriculture and food security are among the most critical issues confronting India in the contemporary era. Agriculture continues to be the backbone of the Indian economy, providing livelihood to a large section of the population and ensuring food availability for over 1.4 billion people. However, increasing pressure on natural resources, environmental degradation, and the adverse impacts of climate change have raised serious concerns about the long-term sustainability of agricultural practices.

The Green Revolution of the 1960s and 1970s played a transformative role in shifting India from a food-deficit to a food-surplus nation through the introduction of high-yielding seeds, chemical fertilizers, and irrigation networks. While this achievement resolved immediate food scarcity, it generated unintended

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consequences: soil nutrient depletion, groundwater overexploitation, loss of biodiversity, and increased chemical dependency.[1] These consequences have made the imperative for sustainable agricultural practices not merely aspirational but structurally necessary.

Food security, in the modern legal and policy sense, transcends the mere availability of food grains. It encompasses accessibility, affordability, nutritional quality, and long-term stability.[2] In India, this understanding received statutory recognition through the National Food Security Act (NFSA), 2013, which institutionalised access to subsidised food as a legal entitlement grounded in the constitutional guarantee of the right to life under Article 21. Yet the integration of sustainability into the food security legal framework remains fragmented and incomplete.

This article examines the relationship between sustainable agricultural practices and food security in India from a socio-legal perspective. It analyses existing legal and policy frameworks, evaluates structural challenges, proposes legislative reforms, and draws on international comparative perspectives to articulate a comprehensive pathway toward a resilient and sustainable food system.

II. THE NEXUS BETWEEN SUSTAINABLE AGRICULTURE AND FOOD SECURITY

A. Conceptual Framework of Sustainable Agriculture

Sustainable agriculture is grounded in three core pillars: environmental sustainability, economic viability, and social equity. It refers to farming systems that meet present food needs without compromising the ability of future generations to meet their own needs—a formulation that echoes the Brundtland Commission's canonical definition of sustainable development.[3] In India, this concept embraces a range of practices including organic farming, Zero Budget Natural Farming (ZBNF), agroecology, climate-smart agriculture, crop diversification, and integrated farming systems.

Organic farming avoids synthetic fertilisers and pesticides, relying instead on compost, green manure, and biological pest control, thereby improving soil quality. ZBNF employs locally available resources such as cow dung and cow urine to prepare natural inputs, reducing cultivation costs and debt burdens. Agroecology integrates ecological science with farming through mixed cropping, natural pest management, and soil conservation. These systems demonstrate that sustainability can coexist with productivity when supported by appropriate policy and market structures.

B. Food Security: Dimensions and Legal Significance

Food security is a multidimensional concept. The four internationally accepted dimensions—availability, accessibility, utilisation, and stability—capture both the material and relational aspects of the right to food.[4] In India, food security has acquired particular legal significance through Article 21 of the Constitution, which the Supreme Court has interpreted to encompass the right to live with dignity, including access to adequate nutrition.

The NFSA 2013, a landmark piece of social legislation, guarantees subsidised food grains to approximately 67 per cent of India's population through the Public Distribution System. While it institutionalised food as a legal entitlement, it addresses distribution rather than the ecological sustainability of production. This structural gap between the legal framework of food distribution and the ecological imperatives of food production lies at the heart of the reform challenge.

C. The Interrelationship with Climate Change

India's agriculture is acutely vulnerable to climate variability. Irregular monsoon patterns, droughts, floods, heatwaves, and escalating pest attacks directly affect crop yields and farmer incomes.[5] Unsustainable farming practices amplify this vulnerability by

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degrading the soil and water resources that form the ecological foundation of food production. Conversely, sustainable practices—organic matter management, crop diversification, agroforestry, and efficient irrigation—improve resilience to climate shocks while simultaneously reducing agriculture's own contribution to greenhouse gas emissions.

The interlocking relationship between agriculture, climate change, and food security thus creates a compelling policy argument: investing in sustainable agriculture is simultaneously an investment in climate adaptation, farmer welfare, and long-term food security. The question is no longer whether to make this shift, but how to structure the legal and institutional architecture to enable it at scale.

III. CONSTITUTIONAL AND STATUTORY FRAMEWORK

A. Constitutional Provisions

The Constitution of India provides a normative foundation for sustainable agricultural governance. Several provisions, read together, establish the State's responsibility to ensure both food security and environmental sustainability.

Article 21 guarantees the right to life, which the Supreme Court has progressively interpreted to encompass the right to food, the right to a healthy environment, and the right to livelihood. In *People's Union for Civil Liberties v Union of India*,[6] the Supreme Court transformed the right to food from a policy aspiration into a justiciable entitlement, directing the government to implement food security schemes.

Article 39(b) directs the State to ensure that the material resources of the community are distributed for the common good—a provision with direct implications for land reform and equitable access to natural resources. Article 47 imposes a duty on the State to raise the level of nutrition and the standard of living of the people. Article 48A, introduced by the 44th Constitutional Amendment, directs the State to protect and improve the environment. Together, these provisions create a constitutional mandate for sustainable agricultural governance that integrates food production, environmental conservation, and social equity.

B. The National Food Security Act, 2013

The NFSA 2013 represents the most significant legal intervention in food security in independent India. Its principal achievement is the conversion of food entitlement from a welfare benefit into a statutory right—enforceable in law. It provides for the supply of rice, wheat, and coarse grains at highly subsidised prices to eligible households, establishes grievance redressal mechanisms, and mandates transparency in Public Distribution System operations.

However, the Act's limitations from a sustainability perspective are significant. It focuses overwhelmingly on food grain distribution rather than the ecological conditions of production. It does not contain provisions that incentivise or mandate sustainable production methods, nor does it link procurement preferences to environmental criteria. The structural result is a legal framework that can ensure short-term food access while remaining indifferent to the long-term ecological conditions that make such access sustainable. This gap between the NFSA's distributional ambitions and its ecological silence is a central challenge for legal reform.

C. Environmental Legislation and Agricultural Governance

Several environmental statutes indirectly shape agricultural practice. The Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 regulate pollution from agricultural sources. The Environment Protection Act, 1986 provides a comprehensive legal framework for environmental regulation, including standards affecting agrochemical use and waste disposal.

Biodiversity and forest conservation laws protect ecosystems that support agricultural productivity.

Indian courts have developed an influential body of environmental jurisprudence—encompassing the principles of sustainable development, the precautionary principle, the polluter-pays principle, and inter-generational equity[7]—that has progressively shaped agricultural governance. The Supreme Court's recognition of these principles as part of Article 21 jurisprudence creates a normative basis for requiring that agricultural policy account for long-term environmental consequences.

D. Sustainability Schemes: NMSA, PKVY, and PM-PRANAM

The National Mission for Sustainable Agriculture (NMSA), one of eight missions under the National Action Plan on Climate Change, seeks to enhance productivity through water-use efficiency, soil health management, and climate-resilient farming. The Paramparagat Krishi Vikas Yojana (PKVY) promotes organic farming through a cluster-based approach, supporting certification and marketing linkages. The Soil Health Card Scheme provides farmers with nutrient analysis data to guide balanced fertiliser application. The PM-PRANAM Scheme creates financial incentives for states to reduce chemical fertiliser dependence.

These initiatives represent a meaningful policy commitment to sustainability. Their limitations, however, are equally instructive: they operate in relative institutional isolation, are characterised by weak monitoring and evaluation systems, suffer from inadequate funding allocation in many states, and lack a unified legal foundation that could give them binding force and coherent institutional direction.[8]

IV. INTERNATIONAL LEGAL FRAMEWORK AND COMPARATIVE PERSPECTIVES

A. The UN Sustainable Development Goals

The UN Sustainable Development Goals (SDGs), adopted in 2015, provide an overarching normative framework for linking food security with sustainable agriculture at the global level. SDG 2 (Zero Hunger) specifically targets the elimination of hunger, the achievement of food security, improved nutrition, and the promotion of sustainable agriculture by 2030. It includes measurable targets relating to small farmer productivity, genetic diversity of seeds, sustainable food production systems, and resilient agricultural practices.

SDG 2 is reinforced by a cluster of related goals: SDG 1 (No Poverty), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 15 (Life on Land), and SDG 6 (Clean Water and Sanitation). The integrated SDG framework recognises that sustainable agriculture is simultaneously a means of poverty reduction, environmental protection, and climate adaptation. India's commitment to achieving the SDGs provides a normative basis for legislative and policy reforms that mainstream sustainability into food security governance.

B. Climate Agreements and Agricultural Obligations

The Paris Agreement (2015) under the United Nations Framework Convention on Climate Change explicitly acknowledges the relationship between food security and climate change, recognising the need for adaptation of food production systems to climate impacts. Agriculture both contributes to greenhouse gas emissions—through synthetic fertiliser use, livestock methane, residue burning, and land-use change—and is acutely vulnerable to the climate disruptions those emissions generate. As a party to the Paris Agreement, India has committed to reducing emission intensity and strengthening adaptation measures, including through climate-resilient agricultural practices.

C. WTO, Trade Law, and Food Security

The WTO Agreement on Agriculture regulates domestic support measures, export subsidies, and market access in agricultural trade. India has consistently advocated, in WTO negotiations, for policy flexibility for developing

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