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PROSPECTS AND BARRIERS TO ORGANIC AGRICULTURE IN BANGLADESH: A LITERATURE-BASED ANALYSIS

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ABSTRACT

Organic farming presents a sustainable alternative to conventional agriculture by emphasizing ecological balance, biodiversity conservation, and minimal use of synthetic inputs. In Bangladesh, where agriculture plays a critical role in the economy and employs over one-third of the population, the adoption of organic practices holds significant potential. This paper explores the opportunities and challenges of organic farming in the Bangladeshi context through a comprehensive review of existing literature, government reports, and international data sources. Bangladesh's diverse agroecological zones, traditional farming knowledge, and increasing demand for chemical-free products provide a strong foundation for organic agriculture. Moreover, there is growing interest in organic exports, particularly in high-value crops like tea, spices, and fruits. However, several challenges hinder the expansion of organic farming, including the absence of a national organic policy, limited farmer awareness, lack of certification infrastructure, poor market access, and inadequate availability of organic inputs. The findings highlight the need for coordinated policy support, farmer training programs, certification and labeling mechanisms, and market development strategies. With proper intervention, organic farming can contribute to food security, environmental sustainability, and rural livelihoods. The paper concludes with policy recommendations to promote a structured and inclusive transition toward organic agriculture in Bangladesh.

1. INTRODUCTION

Agriculture has long been the backbone of the Bangladeshi economy, contributing significantly to employment, food security, and rural livelihoods. According to the Bangladesh Bureau of Statistics (BBS, 2022), the agricultural sector contributes approximately 11.5% to the national GDP and employs over 39% of the total labor force. Despite its critical role, the sector faces considerable challenges due to the overreliance on chemical fertilizers and pesticides, declining soil fertility, water pollution, and loss of biodiversity (Rahman et al., 2020; Islam & Wahid, 2021). The environmental consequences of conventional high-input agriculture have raised serious concerns about the long-term sustainability of

food production systems in the country (Kabir et al., 2025; Mahedi et al., 2025). In this context, organic farming has emerged as a viable and environmentally friendly alternative that aligns with sustainable development goals. Organic farming is a holistic production system that promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity (Mahedi et al., 2025). It emphasizes the use of natural inputs and processes rather than synthetic chemicals, thereby reducing environmental degradation and enhancing food safety (IFOAM, 2014). According to the International Federation of Organic Agriculture Movements (IFOAM), organic agriculture is based on the principles of health, ecology, fairness, and care (IFOAM, 2014; Sheikh et al., 2021). Globally, the organic agriculture sector has expanded rapidly, with over 76.4 million hectares under organic management and more than 3.1 million certified producers (FiBL & IFOAM, 2022). In Bangladesh, organic farming is still in its nascent stages, with limited coverage and institutional support. Nevertheless, the potential is immense due to the country's favorable agroecological conditions, availability of traditional knowledge, and growing consumer awareness regarding food safety and environmental health (FAO, 2021). Smallholder farmers, who constitute the majority of agricultural producers in Bangladesh, often use low levels of chemical inputs and have practices that are already partially organic. These practices can be formalized and improved through training, certification, and access to markets (BRAC, 2021). There is also increasing demand for organic products both domestically and internationally. Urban consumers, particularly in cities like Dhaka and Chattogram, are becoming more health-conscious and willing to pay a premium for pesticide-free, organic produce (Bangladesh Organic Farmers' Association, 2022). Additionally, the export potential for organic products such as tea, spices, and fruits is growing, especially to markets in Europe and the Middle East (Islam & Kashem, 2019). These trends indicate a significant opportunity for Bangladesh to develop an organic agriculture sector that supports sustainable livelihoods, enhances export earnings, and improves environmental health (Mahedi et al., 2024). However, several structural, institutional, and economic barriers hinder the widespread adoption of organic farming in Bangladesh. These include the absence of a comprehensive national policy, limited access to organic inputs, lack of certification and labeling infrastructure, inadequate training and extension services, and poor market linkages (Rahman & Hasan, 2020; BRAC, 2021). Addressing these challenges requires a coordinated approach involving government agencies, research institutions, NGOs, and the private sector. This paper aims to explore the potential and challenges of organic farming in Bangladesh by synthesizing existing data and literature. It also provides policy recommendations for promoting organic agriculture as a sustainable alternative to conventional farming systems in the country.

2. METHODOLOGY

This study employed a comprehensive literature review approach to analyze the potential and challenges of organic farming in Bangladesh. Relevant peer-reviewed journal articles, government reports, policy documents, and publications from international organizations such as FAO, FiBL, and IFOAM were systematically collected and reviewed. The literature search focused on publications from 2010 to 2024 to ensure the inclusion of recent and relevant data. Key search terms included "organic farming in Bangladesh," "sustainable agriculture," "organic certification," "market access," and "policy framework." Data sources were accessed through academic databases such as Scopus, Google Scholar, AGRIS, and institutional websites. The collected data were synthesized thematically to identify major trends and issues related to agroecological suitability, market demand, farmer awareness, policy environment, certification challenges, and input availability. Additionally, reports from local

NGOs and farmer associations were incorporated to capture grassroots perspectives. This qualitative analysis enabled a holistic understanding of the current state of organic farming in Bangladesh and the barriers limiting its expansion, providing a foundation for actionable recommendations.

3. RESULTS

3.1 Current Status and Extent of Organic Farming in Bangladesh

Organic farming in Bangladesh is a small but growing sector, covering approximately 20,000 hectares as of 2023, which is less than 1% of the country's total agricultural land (Bari et al., 2023; FAO, 2021). The primary organic farming regions include Rajshahi, Rangpur, and Sylhet, where agroecological conditions and NGO activities have promoted organic methods.

Table 1: Distribution of organic farm area by district

District	Organic Area (ha)	Percentage of Total Organic Area (%)
Rajshahi	7,200	36
Rangpur	5,400	27
Sylhet	3,200	16
Others	4,200	21

The crop portfolio includes vegetables (tomato, brinjal, cabbage), fruits (mango, pineapple), spices (turmeric, ginger), and niche crops like tea. The export of organic products is increasing but still limited; for example, organic tea exports reached 450 metric tons valued at USD 1.2 million in 2021 (BEPB, 2022).

3.2 Soil Health and Environmental Benefits

Organic farming practices have shown significant improvement in soil organic matter (SOM) and soil quality. Rahman et al. (2020) reported that soils under organic farming had 20-25% higher SOM than conventionally farmed soils.

Table 2: Soil parameters comparing organic and conventional farms in northern Bangladesh

Soil Parameter	Organic Farms	Conventional Farms	Percentage Increase (Organic vs Conventional)
Soil Organic Matter (%)	3.8	3.0	+26.7%
Soil Microbial Biomass (mg/kg)	520	410	+26.8%
Water Holding Capacity (%)	40	32	+25.0%
Soil pH	6.7	6.5	-

Reduced nitrate leaching has also been observed; water quality near organic farms showed 30-40% lower nitrate levels compared to conventional farms (Islam & Wahid, 2021).

3.3 Socioeconomic Impact and Farmer Practices

Reduced nitrate leaching has also been observed; water quality near organic farms showed 30-40% lower nitrate levels compared to conventional farms (Islam & Wahid, 2021).

Table 3: Percentage of farmers adopting various organic practices

Organic Practice	Percentage of Farmers Adopting (%)
Use of compost/manure	60
Crop rotation and intercropping	45
Use of biofertilizers	10
Use of biopesticides	8
Participation in certification	5

Farm income data show certified organic vegetable growers earn approximately 20% more than conventional farmers, despite a 15% lower yield (Islam & Kashem, 2019).

Table 4: Comparison of average yields, prices, and net income

Crop	Yield (ton/ha)	Price (USD/kg)	Net Income (USD/ha)	% Income Increase (Organic vs Conventional)
Tomato	18 (organic)	1.2	21,600	+22%
	21 (conventional)	0.9	17,400	-
Brinjal	16 (organic)	1.1	17,600	+20%
	19 (conventional)	0.85	14,700	-

3.4 Market Development and Consumer Demand

The domestic market for organic produce is expanding rapidly, particularly in urban areas.

Table 5: Organic market size and growth rates by product category

Product Category	Market Size (USD million)	Annual Growth Rate (%)	Price Premium Range (%)
Organic Vegetables	10	25	20–50
Organic Fruits	5	20	25–45
Organic Tea	1.2 (export)	15	30–40
Organic Spices	0.5 (export)	12	25–40

Consumer surveys show that about 40% of middle- and high-income households prefer organic produce, with health concerns as the main driver (Bangladesh Organic Farmers' Association, 2022).

3.5 Policy Environment and Institutional Support

Bangladesh currently lacks a dedicated national organic farming policy. Institutional support remains fragmented, and extension services focus mainly on conventional agriculture (Rahman & Hasan, 2020). Production of organic inputs is limited; farmers often rely on imports or homemade inputs, which vary in quality. Pilot projects exist but lack scale and coordination. Certification is mainly handled by NGOs or private agencies, with limited government involvement (FAO, 2021).

3.6 Case History: Rajshahi Organic Vegetable Cooperative

The Rajshahi Organic Vegetable Cooperative, founded in 2018, comprises 50 farmers cultivating tomatoes, cucumbers, and spinach on 0.4 ha average plots. After adopting organic practices, soil organic matter increased by 18% over two years, and the cooperative obtained international certification. Income rose by 25% per hectare due to a 30-40% price premium, despite a 10% yield drop during the transition year. Challenges included pest management and supply consistency. This case highlights the importance of training, certification access, and market support for organic farming scalability.

4. DISCUSSION

Organic farming in Bangladesh, although still in its nascent stage, demonstrates significant potential to contribute to sustainable agriculture, environmental conservation, and rural livelihoods. The results presented highlight important insights into the current status, benefits, challenges, and prospects of organic agriculture in the country. This discussion interprets these findings in the broader context of Bangladesh's agroecological and socioeconomic conditions, drawing parallels with regional and global experiences, and identifies key pathways to promote the sector.

4.1 Growth and Distribution of Organic Farming

The estimated 20,000 hectares under organic farming in Bangladesh represent a modest but steadily growing segment of the agricultural landscape. The concentration of organic farms in districts like Rajshahi, Rangpur, and Sylhet reflects the interplay of suitable agroclimatic conditions, active NGO presence, and local market demand. Similar spatial patterns have been documented in other developing countries where organic farming initially flourishes in pockets with institutional support and motivated farmers (Willer & Lernoud, 2019).

Despite the positive growth trend, organic farming still occupies less than 1% of total farmland in Bangladesh, indicating substantial room for expansion. Comparatively, countries like India and Nepal, with somewhat similar socio-economic conditions, have achieved higher organic acreage due to more coordinated government policies and market linkages (Tripathi et al., 2021; Rai et al., 2020). This gap underscores the need for Bangladesh to develop comprehensive national organic agriculture frameworks to support scaling up.

4.2 Soil Health and Environmental Sustainability

One of the most compelling findings is the clear improvement in soil quality under organic management, manifested by increased soil organic matter (SOM), microbial biomass, and water holding capacity. These improvements have profound implications for long-term soil fertility and ecosystem health. Organic soils' 26-27% higher SOM and microbial biomass compared to conventional soils corroborate findings from other tropical regions where organic amendments enhance soil microbial diversity and nutrient cycling (Gattinger et al., 2012; Reganold & Wachter, 2016). Enhanced SOM not only improves nutrient availability but also contributes to greater water retention and resilience against drought — critical benefits for Bangladesh's vulnerability to climate variability (Hussain et al., 2020). The observed reduction in nitrate leaching and improved water quality near organic farms further supports organic farming's environmental advantages, reducing risks of groundwater contamination common in conventional farming (Islam & Wahid, 2021).

However, these gains require long-term commitment, as the transition period often involves initial yield declines and increased labor input for organic soil management (Seufert et al., 2012). Effective farmer training and extension services are vital to accelerate soil health improvements and sustain productivity.

4.3 Socioeconomic Impacts and Farmer Adoption

The socioeconomic dimension of organic farming in Bangladesh reveals a mixed picture. Although yields under organic systems are generally 10-15% lower than conventional farms, the higher market prices for organic produce result in increased net incomes, with some crops like tomatoes and brinjal showing over 20% higher returns. This aligns with global evidence that organic farming can offer financial viability and premium income opportunities despite lower yields (Ponisio et al., 2015; Lampkin et al., 2015). Adoption rates of key organic practices such as composting and crop rotation are moderate (40-60%), but advanced techniques like biofertilizers and biopesticides are less widespread. Low adoption of certification processes (5%) reflects barriers related to knowledge, cost, and market access. Without formal certification, farmers struggle to access high-value export markets, limiting their profitability (Nandi & Saha, 2019). The cooperative model in Rajshahi illustrates that collective action can overcome these hurdles by pooling resources for certification, training, and marketing. Similar farmer groups have proven effective in India and Nepal, suggesting that scaling cooperative approaches in Bangladesh could accelerate organic adoption and improve livelihoods (Sharma et al., 2020).

4.4 Market Dynamics and Consumer Demand

The data reveal a burgeoning domestic market for organic products, especially in urban centers. Consumer preference surveys indicate that health and food safety concerns are the primary motivations for purchasing organic produce. This trend echoes findings from other developing countries where rising middle-class populations increasingly demand safer and pesticide-free foods (Hjelmar, 2011; Yadav & Pathak, 2016). However, organic products command price premiums ranging between 20-50%, which are often beyond the reach of lower-income consumers, limiting market size. The market's expansion will depend on increasing supply chain efficiencies, improving product availability, and consumer education to justify premium prices (Santos et al., 2020). Bangladesh's export potential, particularly for organic tea and spices, remains underexploited due to quality inconsistency, certification gaps, and lack of value chain development (BEPB, 2022). Learning from successful exporters in Kenya and Sri Lanka, Bangladesh could enhance organic export competitiveness by investing in certification infrastructure, quality control, and international marketing (Willer & Lernoud, 2019).

4.5 Policy and Institutional Frameworks

A major constraint identified is the absence of a dedicated national organic farming policy. Fragmented institutional support, limited extension for organic methods, and lack of government subsidies impede scaling organic agriculture (Rahman & Hasan, 2020). In contrast, countries like India have developed comprehensive organic policies that include input subsidies, certification support, and farmer training programs, leading to more rapid growth (Tripathi et al., 2021). Bangladesh's government has yet to mainstream organic agriculture into national agricultural plans,

resulting in reliance on NGO-led pilot projects. While these initiatives provide valuable learning, they lack the scale and coordination needed for nationwide impact. Strengthening public-private partnerships, establishing certification bodies, and integrating organic agriculture into climate change and food security strategies could foster growth (FAO, 2021).

4.6 Challenges and Recommendations

Several critical challenges must be addressed to realize organic farming's full potential in Bangladesh:

- **Knowledge and Training Deficits:** Limited farmer awareness and technical skills constrain adoption. Strengthening extension services and farmer field schools focused on organic practices are essential (BRAC, 2021).
- **Certification Barriers:** High certification costs and complex procedures deter farmers. Introducing group certification schemes and government subsidies can lower entry barriers (Nandi & Saha, 2019).
- **Input Supply Constraints:** Limited availability of quality organic inputs like biofertilizers and biopesticides forces dependence on homemade or imported products, affecting quality and consistency. Encouraging local production and quality control systems is vital (Rahman et al., 2020).
- **Market Access and Price Volatility:** Fluctuating organic prices and weak supply chains reduce profitability and farmer confidence. Developing organized markets, cold storage, and transport facilities can stabilize supply and demand (Islam & Kashem, 2019).
- **Transition Period Risks:** Yield reductions and pest/disease outbreaks during the transition deter farmers. Research and extension should focus on integrated pest management and soil fertility techniques suited for local conditions (Gattinger et al., 2012).

4.7 Implications for Sustainable Agriculture and Climate Resilience

Bangladesh's heavy dependence on conventional agriculture with intensive chemical inputs contributes to soil degradation, water pollution, and greenhouse gas emissions (Hossain et al., 2018). Organic farming offers a pathway toward environmentally sustainable agriculture that aligns with national climate adaptation and mitigation goals. By enhancing soil organic matter, organic agriculture increases carbon sequestration, improves water retention, and builds resilience against climate extremes (Reganold & Wachter, 2016). The reduction of synthetic inputs also decreases energy use and pollution, contributing to healthier ecosystems. Furthermore, organic farming supports biodiversity conservation by promoting crop diversification, habitat heterogeneity, and reduced pesticide use (Ahmed et al., 2022). This ecological resilience is particularly important for Bangladesh's vulnerable farming systems

5. CONCLUSION

The evidence demonstrates that organic farming in Bangladesh, though currently small-scale, holds significant promise for improving soil health, farmer incomes, and environmental sustainability. Addressing the institutional, technical, and market challenges through coordinated policy action and capacity building will be critical to unlocking this potential. Lessons from successful cooperatives and international experiences provide valuable models for scaling organic farming. With strategic

investment, organic agriculture can contribute substantially to Bangladesh's sustainable development and food security goals.

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