India's Agriculture Sector and Economic Resilience Amid Global Challenges: An Indian Scenario

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ABSTRACT

India's agriculture sector continues to play a pivotal role in sustaining economic growth. Ensuring food security, and supporting rural livelihoods amid rising global uncertainties. According to the United Nations' *World Economic Situation and Prospects 2025 (WESP 2025)* report, India is projected to achieve a GDP growth rate of 6.6% in 2025, the highest among major economies. Agriculture remains central to this resilience through diversified production systems, export competitiveness, and policy support mechanisms. However, climate change, food inflation, supply-chain disruptions, and rising input costs continue to threaten agricultural sustainability. This paper examines the Indian agricultural scenario in the context of WESP 2025, focusing on sectoral strengths, emerging opportunities, major challenges, maize-sector transformation, edible oil dependency, seafood exports, and policy imperatives for sustainable growth. The study concludes that innovation-driven and climate-resilient agriculture will be essential for India's long-term economic stability and global agricultural leadership (United Nations, 2025).

INTRODUCTION

Agriculture has historically been the backbone of the Indian economy, contributing to employment, food security, and rural development. Despite rapid industrialization and expansion of the service sector, agriculture continues to support nearly half of India's workforce and remains vital for socio-economic stability. The *World EconomicsSituation and Prospects 2025 (WESP 2025)* report published by the United Nations highlights India as one of the fastest-growing major economies, with agriculture acting as a stabilizing force amid global disruptions.

Global agriculture currently faces severe challenges arising from climate change, geopolitical tensions, inflationary pressures, and disrupted supply chains. Developing economies are particularly vulnerable to food inflation and production instability. In this context, India's diversified agricultural base, technological adaptation, and policy interventions have enhanced the resilience of the sector. The present study explores the role of Indian agriculture in sustaining economic resilience under changing global dynamics.

1. Global Economic and Agricultural Outlook under WESP 2025

The WESP 2025 report projects global economic growth at approximately 2.8%, reflecting sluggish recovery due to geopolitical instability, debt burdens, and climate-related disruptions. Agricultural systems worldwide are experiencing increasing stress from extreme weather events, declining soil health, and rising production costs.

Food inflation continues to affect developing nations disproportionately. Supply-chain bottlenecks and energy price volatility have further intensified pressure on food systems. Against this backdrop, India has emerged as a relatively stable economy with strong domestic demand, public investment, and agricultural support systems.

India's projected GDP growth rate of 6.6% in 2025 significantly surpasses major economies such as China and the United States. The agricultural sector contributes substantially to this resilience through stable food grain production, export growth, and rural income generation.

2. Strengths of India's Agricultural Sector

2.1 Diversified Production System

India possesses one of the world's most diversified agricultural systems, producing cereals, pulses, oilseeds, fruits, vegetables, spices, tea, cotton, and marine products. Such diversity reduces vulnerability to market and climatic shocks.

2.2 Export Competitiveness

India is a leading exporter of rice, tea, spices, and seafood products. Agricultural exports contribute significantly to foreign exchange earnings and strengthen the country's trade balance. Growing international demand for organic and processed foods also provides new opportunities for export diversification (Ministry of Commerce and Industry, 2025).

2.3 Technological Transformation

Digital agriculture is transforming the agricultural sector through the adoption of digital marketplaces, precision farming techniques, smart irrigation systems, drone-based crop monitoring, mobile-based advisory services, and artificial intelligence applications, thereby improving productivity, resource efficiency, market access, and decision-making among farmers.

Government initiatives promoting mechanization and digital infrastructure have

improved farmer-market linkages and productivity (Ministry of Agriculture and Farmers Welfare, 2025).

2.4 Policy Support

The Government of India continues to strengthen the agricultural sector through various policy interventions and welfare-oriented schemes. Key support mechanisms include the Minimum Support Price (MSP) system, crop insurance programs, fertilizer subsidies, irrigation development projects, rural infrastructure expansion, and renewable-energy integration in farming practices (Ministry of Agriculture and Farmers Welfare, 2025).

The MSP framework provides income security to farmers by ensuring remunerative prices for major crops, while crop insurance schemes help reduce the financial risks associated with climate variability and natural disasters. Fertilizer subsidies and irrigation projects support increased agricultural productivity by lowering input costs and improving water availability. In addition, investments in rural roads, storage facilities, cold-chain infrastructure, and renewable-energy technologies such as solar-powered irrigation systems contribute to sustainable agricultural development. Collectively, these policy measures enhance production stability, strengthen food security, and improve farmer welfare in India.These measures enhance production stability and farmer welfare.

3. Climate Challenge

3.1 Climate Vulnerability

India remains highly vulnerable to climate variability, with erratic monsoons, heat waves, droughts, floods, and La Niña events posing serious threats to agricultural productivity and national food security. Rainfed agriculture, which constitutes a significant portion of the cultivated area, is especially susceptible to changing climatic conditions. Climate-induced stresses are expected to reduce crop yields and adversely affect major agricultural commodities such as wheat, rice, pulses, oilseeds, and horticultural crops, thereby impacting farmers' incomes, rural livelihoods, and overall agricultural sustainability.

3.2 Rising Food Inflation

Food inflation remains a major concern in India. Increasing transportation costs, energy prices, and supply disruptions have elevated food prices, affecting vulnerable populations disproportionately. The persistence of food inflation above 5% in many developing economies indicates structural challenges in food distribution and supply management.

4. India's Emerging Maize Revolution

4.1 Growing Importance of Maize

India's maize sector is undergoing a major structural transformation, with demand projected to increase from nearly 50 million tonnes in 2025–26 to around 72 million tonnes by 2030–31 due to rapidly expanding industrial requirements. Maize has emerged as a strategic crop because of its extensive utilization in ethanol production, poultry and livestock feed, starch manufacturing, and food processing industries, making it increasingly important for both agricultural and industrial growth (FICCI & YES BANK, 2025).

4.2 Ethanol Blending Programme

India's ethanol blending programme has significantly boosted maize demand, with maize gradually overtaking sugarcane and rice as a major feedstock for ethanol production. The government's target of achieving 20% ethanol blending (E20) has accelerated investments in grain-based distilleries, and by 2030–31 the ethanol industry alone is expected to consume nearly 20–25 million tonnes of maize annually. (FICCI & YES BANK, 2025)

4.3 Poultry and Feed Industry

The poultry sector continues to be the largest consumer of maize in India, while the rapid expansion of poultry, dairy, and aquaculture industries is expected to sustain strong future demand for maize-based feed products and strengthen the crop's role in the agricultural economy.

4.4 Productivity Constraints

Despite increasing production, maize productivity in India remains below global standards due to several structural and technological constraints, including rainfed cultivation, low mechanization, pest infestations, inadequate post-harvest infrastructure, and limited adoption of hybrid seeds. Greater investment in agricultural research, extension services, improved storage systems, and modern farming technologies is therefore essential to enhance maize productivity and ensure long-term sustainability.

5. Vegetable Oil Import Dependency

India continues to remain heavily dependent on edible oil imports, with vegetable oil imports rising significantly during the first half of the 2025–26 oil year, mainly because of increased palm oil imports. Rising global edible oil prices, rupee depreciation, increasing import bills, and heavy dependence on foreign suppliers have emerged as major concerns for the economy. Indonesia and Malaysia remain the leading exporters of palm oil to India, while Argentina, Brazil, Russia, and Ukraine are major suppliers of soybean and sunflower oils. To reduce import dependency and strengthen domestic self-reliance, India must promote higher oilseed production through improved seed technology, expansion of oilseed cultivation, efficient procurement mechanisms, and development of processing and storage infrastructure (Solvent Extractors' Association of India, 2025).

6. Seafood Exports and International Trade

India's aquaculture and seafood sectors have shown impressive export growth. The European Union's revised approval for Indian aquaculture exports reflects confidence in India's food safety and quality standards.

The EU remains one of India's largest seafood markets, with strong demand for farmed shrimp and processed marine products. Compliance with international sanitary and phytosanitary standards will remain essential for sustaining export competitiveness.

7. Opportunities for Sustainable Agricultural Growth

7.1 Renewable Energy Integration

The integration of renewable energy in agriculture through solar-powered irrigation systems, battery-operated cold storage units, energy-efficient logistics, and sustainable mechanization offers significant opportunities to reduce production costs, improve energy efficiency, and minimize environmental impacts.

7.2 Climate-Resilient Agriculture

Climate-resilient agriculture emphasizes the adoption of climate-smart practices such as drought-tolerant crop varieties, water-efficient irrigation methods, crop diversification, agroforestry, and conservation agriculture to enhance sustainability and reduce vulnerability to climate change.

7.3 Digital and Precision Farming

Digital and precision farming technologies, including artificial intelligence, remote sensing, and smart farm management systems, can improve resource-use efficiency, market intelligence, crop forecasting, pest management, and supply-chain transparency, thereby transforming modern agriculture in the coming decade. "Digital and precision farming

technologies" (Ministry of Agriculture and Farmers Welfare, 2025).

8. Policy Recommendations

To strengthen agricultural resilience and sustainability in India, greater investment is needed in climate-resilient agriculture, efficient irrigation systems, water management, agricultural mechanization, and digital farming technologies. The government should also focus on strengthening storage facilities, cold-chain networks, and logistics infrastructure to reduce post-harvest losses and improve market efficiency. Encouraging crop diversification, value addition, and the development of agro-processing industries can enhance farmers' income and rural employment opportunities. Improved access to institutional credit, crop insurance, and financial support is essential for reducing farmers' risks and ensuring agricultural stability. Furthermore, enhanced research on drought- and pest-resistant crop varieties, along with the promotion of sustainable farming practices, can improve productivity under changing climatic conditions. Reducing dependency on edible oil imports through strengthened oilseed missions and developing integrated food-feed-fuel policies for maize sustainability will also support long-term agricultural growth. In addition, strengthening farmer-producer organizations (FPOs), cooperative systems, and market linkages can improve farmers' bargaining power and access to profitable markets.

CONCLUSION

India's agriculture sector continues to serve as a cornerstone of economic resilience amid global uncertainties. The WESP 2025 report highlights the sector's importance in sustaining economic growth, food security, rural livelihoods, and export performance. While climate change, inflation, and supply-chain disruptions pose serious risks, India's diversified agricultural base, technological advancements, and proactive policy interventions provide significant opportunities for sustainable growth. The WESP 2025 report highlights the sector's importance (United Nations, 2025).

The transformation of sectors such as maize, aquaculture, and renewable-energy-linked agriculture demonstrates India's potential to emerge as a global agricultural leader. However, long-term success will depend on investments in climate resilience, infrastructure, innovation, and inclusive agricultural policies. Sustainable agricultural development will remain central to India's economic stability and contribution to global food security in the coming decades.

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