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Navigating the Changing Landscape: The Evolving Scenario in Indian Agriculture

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Indian agriculture is transforming due to a mix of structural problems, climate change, policy shifts, consumer demands, and technology changes. The agriculture and allied sector contributes 18.2 % to India's GDP, but it supports 42.3 % of the country's population, showcasing the persistent productivity and income challenges. At the same time, a record level of food grain production and exceptional export performance reinforces the sector's strategic position and resilience. This article reviews the Indian agriculture sector in light of production and productivity, market trends, climate change, export opportunities, digital agriculture, etc. The country's agricultural future likely hinges on lessening the focus on the production paradigm and more on income and sustainability through diversification, climate smart agriculture, strengthened farmer institutions and value chains.

Introduction

For many years agriculture has been at the centre of rural livelihoods, the country's food security, and socio-economic stability. But the rapid adaptations of the sector externally in recent decades have led to substantial change. In recent years, changes in climate, available resources, integrated markets, and altered policies have caused fundamental transformations in systems and farmers' decision-making. Furthermore, new technologies from satellite monitoring to mobile advisory systems have started to change production and management systems. Indian farming today embodies a fundamental contradiction. From a structural point of view it maintains a paradox of strategic significance and structural fragility. It is still central to employment and food availability. However, the sector continues to be plagued by problems of division of land into smaller pieces, inconsistent profitability, production at high risks, and modern farming tools and techniques along with institutional support. Hence, the changing Indian agriculture needs to be examined beyond the achievements and constraints from subsistence farming to commercially integrated and sustainable farming.

Agriculture in the Indian Economy: The GDP–Livelihood Imbalance

One of the most notable aspects of Indian agriculture is the persistent gap between its economic significance and social value. The Economic Survey 2023–24 (as cited by the Government of India) states that agriculture and allied activities contribute about 18.2 per cent to India's GDP at current prices while offering livelihood support to 42.3 per cent of the population. This disparity has far-reaching consequences for the development of agriculture. First, the disparity indicates the lagging agricultural labour productivity compared to other sectors such as industry and services. Second, it indicates the continuing problem of underemployment, as agriculture is the backbone of the economy for a significant proportion of the rural populace, despite the fact the sector generates little household income. Third, it reiterates the need to improve farm income and the potential for productive employment (as diversification and value addition activities economically support the farm sector) and the rural non-farm sector activities (as economically support the value added rural services).

Overall, the agricultural sector will need to focus on maintaining its production levels while also facilitating rural financial stability and the economic advancement of its people.

Foodgrain Production and Food Security: Resilience in Output

India has proven to be remarkably resilient in agricultural production despite structural limitations. A key measure of both agricultural performance and national food security is still foodgrain output. According to the Government of India's final estimates, total foodgrain production in 2023–2024 was 332.298 million tonnes, which indicates an ongoing rise in the production of staple crops. Given the increasing variability of the climate, this result becomes more significant. Irregular monsoon patterns, temperature stress and unseasonal rainfall events have made farming more uncertain. However, India has continued to be able to meet its needs for staple foods, demonstrating the effectiveness of long-term investments in better varieties, the expansion of irrigation in some areas, and institutional support mechanisms like minimum support price-based procurement. However, farmer prosperity cannot be ensured by maintaining foodgrain production alone. Although a production-focused approach is crucial for ensuring national food security, it is unable to adequately address the environmental costs of intensive cultivation systems, income volatility, and regional disparities. As a result, the changing landscape necessitates a change in focus from output alone to productivity efficiency and stable farm income.

Diversification and the Rise of High-Value Agriculture

A defining trend in the ongoing transformation of Indian agriculture is the gradual movement towards diversification and high-value agriculture. Although cropping systems have traditionally been dominated by cereals, the expansion of livestock, fisheries, horticulture, and other related industries suggests that agricultural development is changing. Recent government assessments have highlighted that allied sectors are steadily emerging as robust growth centres. Diversification has a multifaceted significance. Economically, it improves returns per unit area, especially important for small and marginal farmers operating under land constraints. In terms of nutrition, diversification helps farmers adapt to shifting dietary preferences, as the consumption of fruits, vegetables, milk, eggs, and fish is increasing in comparison to staple grains. From a climate perspective, diversified cropping systems reduce vulnerability to weather shocks by distributing production risks. Additionally, diversification encourages more jobs in rural areas, especially through labor-intensive livestock and horticultural businesses. Consequently, high-value agriculture is not merely a shift in cropping pattern, but a strategic pathway for enhancing livelihood resilience and reducing rural distress.

Global Integration and Agricultural Exports: From Subsistence to Competitiveness

The globalization of agricultural markets has increasingly influenced Indian agriculture. The relationship between domestic agricultural production and international trade and demand networks is reflected in export performance. India's agricultural exports, including cotton, were valued at USD 48.76 billion in 2023–2024, making up about 11.16% of all merchandise exports, according to APEDA's export overview. Indian agriculture is shifting from domestic consumption to global competitiveness, as evidenced by its growing export orientation. Better price realization, market diversification, and growth prospects for processed goods can all be found in export-linked value chains. However, exports also introduce complexities such as compliance with sanitary and phytosanitary standards, traceability requirements and the need for consistent quality. Additionally, producers may experience uncertainty due to export restrictions and price volatility. Therefore, stable policies, better logistics, better post-harvest management, and investments in quality assurance systems are necessary to increase agricultural exports.

Climate Change: The Emerging Determinant of Agricultural Sustainability

Climate change has become the most important long-term factor influencing agricultural sustainability of all the transformative forces. Rising average temperatures, more frequent droughts and floods, seasonal unpredictability, and unpredictable monsoon behavior are all having an increasing impact on Indian agriculture. Higher production risk, crop losses, increased irrigation needs, and new pest and disease dynamics are all consequences of these climate shifts. Agricultural strategies must be fundamentally reoriented in response to such changes. In ecologically delicate environments, conventional intensification—which relies heavily on input application—might not be feasible. Rather, climate-smart agriculture, which emphasizes resource efficiency, resilience, and emission reduction, is becoming more and more important. Thus, climate adaptation is not a peripheral concern but the central requirement for sustaining agricultural growth. Climate variability and extreme events pose significant challenges to Indian agriculture, exacerbating risks of droughts, floods, and crop failures. Adapting to climate change requires resilient farming practices, water management strategies, and risk mitigation measures. Investments in climate-smart technologies, weather-resistant crop varieties, and insurance schemes help farmers cope with climatic uncertainties and safeguard livelihoods.

Technology and Digital Agriculture: Knowledge as an Input

A notable feature of present-day agricultural change is the rapid rise of digital agriculture and agri-technology innovations. Input-centric agriculture in India is gradually giving way to knowledge-centric agriculture. Opportunities to revolutionize farm management have been made possible by the growing use of smartphones, remote sensing, AI-driven decision systems, and drone applications. However, the potential for transformation that agritech holds is limited by the digital divide. Lack of equal access to internet connectivity, digital literacy, and costs may act as a barrier to small farmers, who are the ones that need such interventions the most. Thus, the success of digital agriculture depends on an inclusive extension service.

Policy and Institutional Evolution: From Subsidy Orientation to Farmer Institutions

The agricultural governance framework in India is also set to undergo a transition. The focus of policies is slowly shifting from the subsidy of inputs to empowering farmers through institutional and infrastructure development and risk management tools. Farmer Producer Organizations (FPOs) are one of the most promising institutional developments in this area. FPOs have the potential to overcome the disadvantages of small farming through the aggregation of produce, facilitating joint procurement of inputs, and enhancing bargaining power. When combined with market, processing, and credit facilities, FPOs can be a catalyst for the inclusion of small farmers in the agribusiness value chain, helping small farmers participate in agribusiness systems in a more balanced manner. At the same time, the focus of policies on insurance programs, direct benefit transfers, and rural infrastructure development also indicates a larger effort to enhance agricultural resilience and market integration. However, the challenges in the implementation of these policies continue due to disparities in institutional capacity at the state level and the lack of post-harvest infrastructure in many areas.

Shift towards Agroecology

In the wake of concerns regarding environmental sustainability and food security, there is an increasing focus on agroecological methods. These include organic farming, conservation agriculture, and agroforestry. These methods enhance biodiversity, improve soil quality, and make them more resilient to climate change. Farmers are increasingly using integrated pest management, crop diversification, and water-saving irrigation methods.

Policy Reforms, Market Liberalization and Digital transformation

Recent policy changes are intended to liberalize agricultural markets, promote private sector investment, and empower farmers. Such initiatives include Agricultural Produce Market Committee (APMC) reforms, contract farming legislation, and electronic National Agriculture Market (e-NAM). While these policies are intended to promote agricultural markets, they also pose potential risks of market concentration, price volatility, and farmers' negotiating power, which require mechanisms for protection and support. Digital innovations are closing the rural-urban gap and empowering rural communities. E-commerce platforms provide access to inputs, credit, and markets, allowing small farmers to reach wider markets and earn more. Digital literacy initiatives, rural connectivity projects, and skill development activities promote entrepreneurship and livelihood diversification, unlocking the potential of rural youth and women in the agricultural economy.

Conclusion

Indian agriculture is undergoing a major transition driven by climate change, policy reforms, market integration, and technological innovation. While the sector remains crucial for national food security and rural livelihoods, challenges such as low profitability, fragmented landholdings, and climate risks continue to affect sustainability. The future of Indian agriculture depends on shifting from a production-focused approach to one that prioritizes farmer income, diversification, climate-smart practices, digital inclusion, and stronger farmer institutions like FPOs. With coordinated efforts from government, research, private sector and farmers, Indian agriculture can become more resilient, inclusive, and sustainable in the coming years.