

KIRTANE & PANDIT

Indian Agricultural Input Market

Trends, Growth Drivers, and Future Outlook

September 2025





Contents

1. Overview of The Indian Agriculture Sector	01
1.1. Economic Significance: GDP Contribution and Employment Trends	02
1.2. Production and Export Overview	02
2. Indian Agricultural Input Market: Scope & Trends	04
2.1 Market Expanse and Key Segments	04
2.2 Input Market Trends	04
2.3 Input Market Trends	05
2.3.1 Seeds Market	06
2.3.2 Fertilizers Market	06
2.3.3 Pesticides Market	07
2.3.4 Irrigation Market	08
2.3.5 Farm Machinery Market	08
3. Primary Growth Drivers	09
3.1 Technological Advancements	09
3.2 Farmer Income Levels	10
3.3 Rising Food Demand And Population Growth	10
3.4 Credit Facilities And Financial Support	10
4. Pathway To Growth: Government Policies, Institutional Funding & Private Players	11
4.1 Key Policy Initiatives	11
4.2 Institutional Credit Facilities	12
4.3 Role of Key Bodies	13
4.4 Potential Policy Changes	13
4.5 Sustainability Initiatives	14
4.6 Strategic Initiatives of Private Players	15
5. Challenges And Restraints	16
5.1. Infrastructure Deficiencies	16
5.2. Credit Access Limitations	16
5.3 Climate Risks and Vulnerabilities	17
5.4 Raw Material Prices Fluctuation and Supply Chain Disruptions	17
6. Conclusion	18



EXECUTIVE SUMMARY

The agricultural sector in India stands as a fundamental pillar of the nation's economy, profoundly influencing its socio-economic fabric. Historically rooted in the Neolithic period, India currently holds the second position globally in farm outputs. Despite a gradual decline in its contribution to the country's Gross Domestic Product (GDP), agriculture remains the broadest economic sector, employing close to 50% of the Indian workforce. This sector has demonstrated remarkable resilience, achieving an average annual growth rate of 4 to 5% from FY17 to FY25, propelled by structural reforms, strategic government investments, and increasing formalization. India's significant role as a global agricultural exporter, with exports reaching over 120 countries, further underscores its critical position in the international agricultural landscape.

Public policy in India has undergone a significant transformation, moving from an initial post-independence focus on land reforms and ensuring food security, notably through the Green Revolution in the 1960s, to a more contemporary emphasis on sustainability, farmer welfare, and technological integration. This evolution highlights a crucial shift in the nation's agricultural strategy. Previously, the primary objective was to maximize output to feed a growing population. Now, there is a clear recognition that achieving food and nutritional security must be balanced with environmental stewardship and the economic well-being of farmers. This expanded mandate necessitates a more holistic approach, requiring complex policy instruments and substantial investment to simultaneously boost productivity, protect natural resources, and uplift rural livelihoods. India's New Agricultural Policy 2025 exemplifies this dual objective, explicitly targeting a 30% increase in sustainable farming practices nationwide by 2030 while also aiming to ensure comprehensive food and nutritional security for all.

Despite the progress and strategic policy shifts, the Indian agricultural sector continues to face formidable challenges as well. These include persistent issues such as land fragmentation, acute water scarcity, inadequate infrastructure, and the pervasive impacts of climate change, which collectively contribute to the economic distress experienced by many farmers. Furthermore, external factors like fluctuating raw material prices and disruptions in global supply chains pose significant hurdles for the availability and affordability of essential agricultural inputs. The strategies being implemented to mitigate these challenges are deeply embedded within recent policy frameworks. These include a strong emphasis on technological adoption, critical infrastructure improvements, and comprehensive policy reforms designed to facilitate a transition towards more efficient and productive agricultural systems. This proactive approach involves promoting the cultivation of climate-smart crop varieties, implementing integrated pest and nutrient management strategies, and ensuring universal access to affordable credit and robust insurance mechanisms.

The interconnectedness of these global and local challenges means that India's agricultural future is not solely dependent on internal reforms but also on its capacity to adapt to and influence global agricultural paradigms, particularly in the realms of sustainable practices and input markets. The overarching goal is to cultivate a resilient, technologically advanced, inclusive, and environmentally sustainable agricultural sector capable of meeting future food demands. Given this context, this report delves into the dynamics of this vital sector, exploring its production capabilities, export performance, the critical role of agricultural inputs, and the strategic pathways forged through government policies, institutional funding, and private sector engagement to ensure its sustained growth and sustainability.





1. OVERVIEW OF THE INDIAN AGRICULTURE SECTOR

India's agricultural sector is a cornerstone of its economy, deeply intertwined with the nation's social and economic fabric. Today, India stands as a global agricultural powerhouse, ranking second worldwide in farm outputs and holding the distinction of having the highest net cropped area globally. This sector is not merely an economic contributor but a demographic reality, employing over half of the Indian workforce, thereby playing an indispensable role in national income generation and employment. The sector's performance directly impacts the nation's food security, sustains the livelihoods of millions, and underpins broader economic growth. Over recent years, Indian agriculture has exhibited remarkable resilience, maintaining consistent growth rates even amidst various kinds of challenges.

1.1. Economic Significance: GDP Contribution and Employment Trends

India's agriculture sector stands as the foundational pillar of the national economy, serving as the primary livelihood source for more than 50% of its vast population. This sector is a crucial driver for rural livelihoods and the development of allied industries, including dairy, poultry, and fisheries. Its pervasive impact on the socio-economic fabric of the country cannot be overstated.

Historically, agriculture's share in India's Gross Domestic Product (GDP) or Gross Value Added (GVA) has witnessed a gradual decline. From contributing approximately 35% in 1990-91, its share has reduced to around 15-18% in recent years, standing at 18.3% of GVA in 2022-23 and an around 18% in FY25. This reduction is primarily attributed to the accelerated growth of the industrial and service sectors, which contribute higher value addition and attract greater investment. Despite this relative decrease in GDP contribution, the sector's substantial role in generating rural incomes underscores its enduring importance. The sheer number of people dependent on agriculture means that its performance directly influences rural stability, poverty alleviation, and inclusive national development. Consequently, policies aimed at agricultural advancement yield significant ripple effects across the economy.

Beyond domestic sustenance and employment, agriculture significantly bolsters India's foreign trade. In 2022-23, the sector contributed to more than \$50 billion to exports, accounting for approximately 13% of the country's total exports. This robust performance continued, with agricultural exports reaching \$51.9 billion in FY2024-25. This consistent export strength, even in the face of challenges like commodity-specific export restrictions, demonstrates India's increasing influence in the global agricultural market. Investments in agricultural inputs and infrastructure, particularly those that enhance quality, post-harvest management, and value-added processing, offer a dual advantage: they support farmer incomes domestically while simultaneously strengthening the national trade balance. This strategic importance positions the agricultural input market as a key area for both economic and social development.

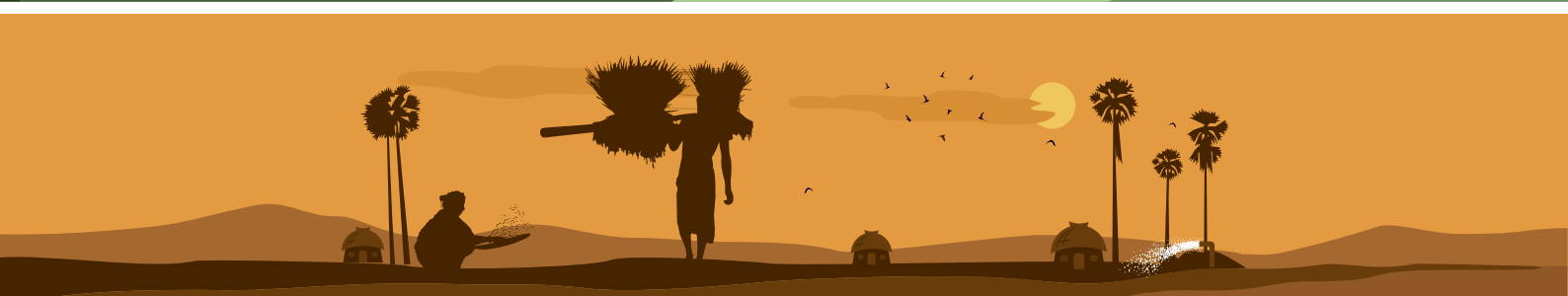
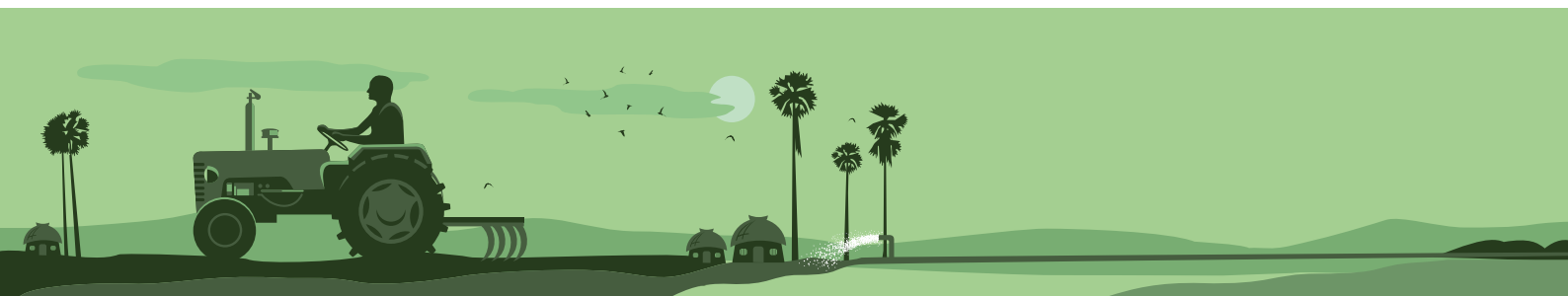
1.2. Production and Export Overview

India's agricultural production capabilities are vast, positioning the country as a significant player on the global stage. The nation ranks second worldwide in overall farm outputs. This impressive scale is further highlighted by its standing as the world's second-largest producer of staple crops such as rice, sugarcane, and wheat, alongside a wide array of vegetables. Beyond these, India is among the top five global producers for over 80% of agricultural produce items, encompassing crucial cash crops like coffee and cotton. This sheer volume and diversity of production underscore India's immense capacity and its strategic importance in the shifting global agricultural landscape.

The country's export performance in agriculture has witnessed an explosive growth trajectory over the past decade. From approximately \$5 billion in 2004, agricultural exports surged to \$39 billion by 2013 to \$52 billion in FY2024-25, solidifying India's position as one of the largest agricultural exporter globally. India's agricultural and processed food products are dispatched to over 120 countries, with primary markets including Japan, Southeast Asia, SAARC nations, the European Union, and the United States. Notably, a significant portion of these exports caters to developing and least developed nations, highlighting India's role in global food security.



Despite its immense scale and impressive export growth, Indian agriculture faces a notable disparity between its large output volume and its per-unit efficiency. While the country boasts the highest net cropped area globally and is a leading producer across numerous categories, its crop yields remain significantly lower, ranging from just 30% to 60% of the best sustainable yields achieved in developed and other developing nations. This indicates that a substantial portion of India's high production volume is achieved through extensive farming practices (utilizing vast land area) rather than intensive methods (maximizing output per unit of land). This presents a considerable untapped potential for enhancing efficiency and productivity. The path forward for Indian agriculture involves moving beyond merely increasing acreage to adopting modern farming practices and technologies that can boost yields per hectare. This shift from extensive to intensive, sustainable growth is crucial for future development. The growth in agricultural exports also signals a deepening integration into global supply chains. This integration extends beyond just primary production, necessitating comprehensive improvements in post-harvest management, logistics, and processing capabilities. The recognition of a \$4 billion opportunity within integrated agricultural value chains, particularly for livestock and plantation crops, and the imperative to reduce food spoilage and improve infrastructure, directly link India's export ambitions to the development of a more sophisticated and efficient agricultural value chain. This evolution is vital for the country to capitalize fully on its production advantages and transition from being primarily a raw commodity exporter to a producer of higher-value processed agricultural goods.





2. INDIAN AGRICULTURAL INPUT MARKET: SCOPE & TRENDS

2.1 Market Expanse and Key Segments

The agricultural inputs market encompasses a wide array of products and services essential for productive crop and livestock farming, directly contributing to global food security. These inputs are integral to enhancing yields, improving crop quality, and building resilience against biotic and abiotic stresses. The Indian agricultural input market, a vital supply chain for the nation's vast agricultural sector, includes a diverse range of products with key segments as seeds, fertilizers, pesticides (& agrochemicals), irrigation systems, and farm machinery.

The overall agriculture industry in India, which includes inputs, is projected to expand significantly, reaching to INR 236,603.2 Billion by 2033, exhibiting a robust Compound Annual Growth Rate (CAGR) of 10.08% during the forecast period of 2025-2033. This substantial growth trajectory underscores the increasing demand for and investment in agricultural inputs across the country. The global agricultural inputs market is a substantial and expanding sector, valued at approximately USD 510 billion in 2024 and projected to grow to USD 750 billion by 2033, at a compound annual growth rate (CAGR) of about 4.3%. A notable trend in this market is an increasing shift towards biological and organic components, driven by a growing emphasis from farmers and policymakers on sustainability and environmental safety. This movement is further propelled by public concerns regarding soil degradation, chemical residues in food, and evolving regulations against synthetic agrochemicals, leading to a surge in demand for biofertilizers, biopesticides, and organic seeds.

The dynamics of the global input market are shaped by several driving factors and inherent challenges. Continuous population growth and the escalating global demand for food are primary drivers, necessitating enhanced agricultural productivity and, consequently, greater utilization of high-yielding inputs like fertilizers and pesticides. Innovation, encompassing precision farming, biotechnology, and digital agriculture — including smart crop monitoring, drone application, and genetically modified (GM) seeds — also fuels demand for more efficient inputs. However, the market faces significant constraints, particularly fluctuations in raw material prices (e.g., natural gas for nitrogen fertilizers) and disruptions in supply chains, which directly impact the cost and availability of essential agricultural components. Opportunities, conversely, are abundant in the burgeoning demand for organic and sustainable farm inputs, a trend actively supported by government incentives worldwide.

Agricultural input markets play a key role in farming productivity, as farmers rely on essential inputs like seeds, fertilizers, irrigation, machinery, and agrochemicals to increase yields and support food security. Agrochemicals help control pests, weeds, and diseases, boosting output and reducing post-harvest losses, which enhances trade and exports. Increased input use, such as fertilizers and labor, has historically driven global agricultural growth and improved resource efficiency.

2.2 Input Market Trends

The agricultural input market is rapidly evolving, with a global shift toward biological and organic products due to rising demand for sustainable practices from both farmers and policymakers. Concerns over soil health, food safety, and stricter regulations are driving increased use of biofertilizers, biopesticides, and organic seeds. At the same time, innovations in precision farming, biotechnology, and digital tools, such as smart monitoring, drone pesticide application, and GM seeds, are improving efficiency and yields. Government incentives and subsidies further support the adoption of eco-friendly alternatives.

These global trends hold significant relevance for Indian agriculture, particularly in light of the nation's strategic push for sustainable farming practices outlined in the India New Agricultural Policy 2025. This policy directly aligns with the global shift towards bio-based inputs by emphasizing "sustainable resource use" through the promotion of organic and regenerative farming, water conservation, and integrated pest and nutrient management. This demonstrates that Indian government policy is not merely reacting to global market dynamics but is actively shaping and accelerating the adoption of sustainable inputs within the country, fostering a more conducive environment for bio-based and precision agriculture technologies.

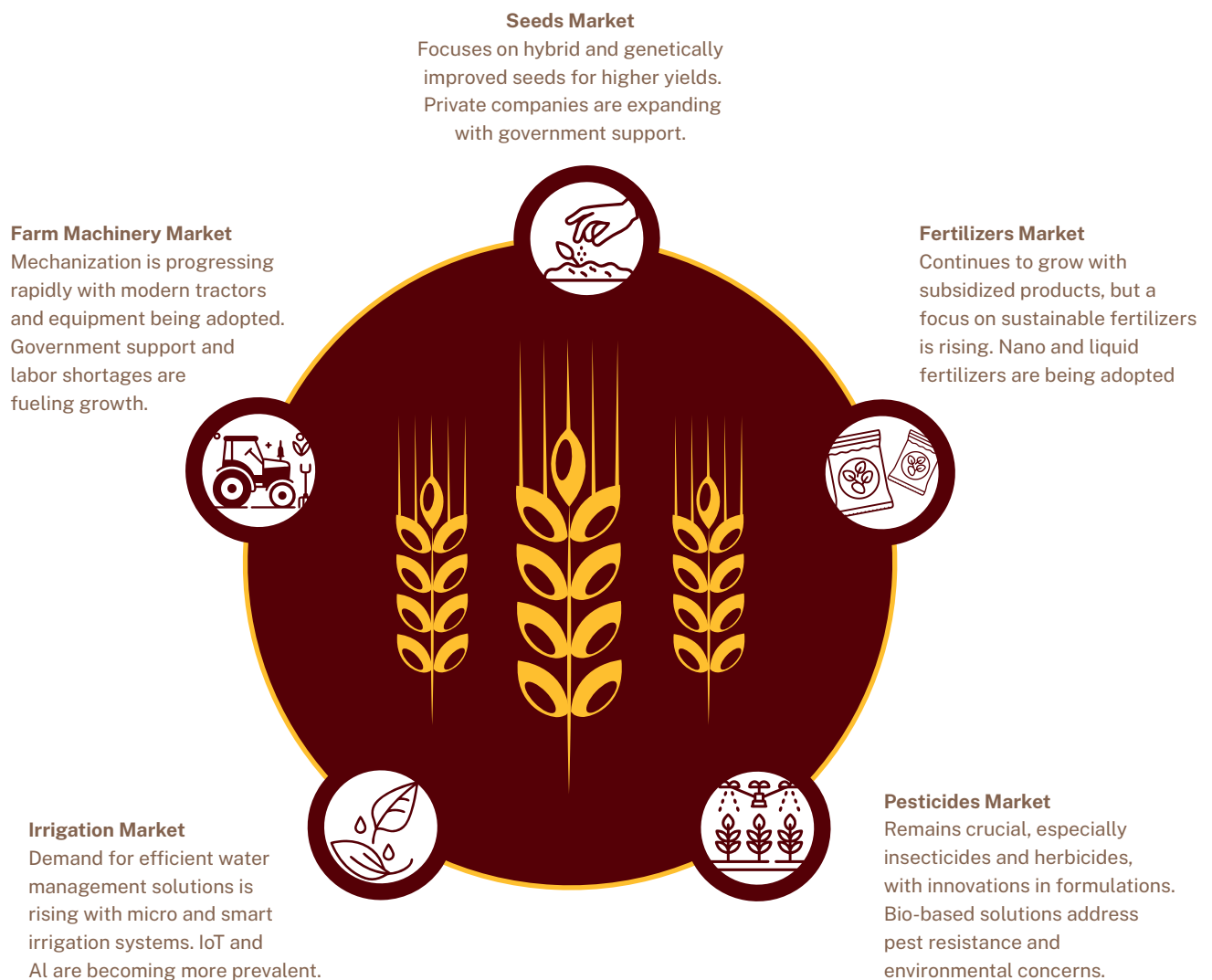


Technological integration is central to India's agricultural policy, promoting tools like satellite monitoring, IoT, AI, and drones for precise farm management and input optimization. Digitalization is shifting agriculture from broad applications to targeted, data-driven methods, improving efficiency, yields, and reducing environmental impact. The policy also seeks financial inclusion through universal access to affordable crop loans and improved insurance, enabling investment in quality, sustainable inputs.

2.3 Input Market Trends

As previously mentioned, the Indian agricultural input market comprises a diverse range of products, with major segments including seeds, fertilizers, pesticides and agrochemicals, irrigation systems, and farm machinery.

Indian Agricultural Input Market Components





2.3.1 Seeds Market

The Indian seed market is in the midst of a profound transformation, driven by technological advancements and evolving agricultural practices. The market size is estimated at USD 3.82 billion in 2025 and is projected to reach USD 5.01 billion by 2030, growing at a CAGR of 5.56%. The hybrid seeds segment dominates the Indian seed market, accounting for approximately 70% of the total market value in 2024. This dominance stems from their superior characteristics, such as higher productivity, wider adaptability, and enhanced resistance to stresses, often delivering 50% higher yields than conventional varieties.

Technological adoption drives this segment, with modern breeding techniques such as molecular markers and genetic selection improving crop varieties for local conditions and resistance to stresses like climate change and pests. Protected cultivation is supporting year-round production, especially of vegetables, and seed companies are developing specialized varieties for these environments. The decrease in arable land has led to a focus on high-yield seeds requiring fewer inputs, which aligns with precision agriculture methods. There is strong demand for disease-resistant varieties in crops like wheat, cotton, cabbage, onion, chili, and tomato due to changing climates and virus issues. Private companies now play a larger role in seed production, investing heavily in quality seeds for various crops. Government initiatives and organizations like ICAR also support the market by promoting breeder seed production and encouraging the use of high-yield, resilient, and biofortified varieties.

Key companies working in this sector include Mahyco Seeds Company Ltd., Nuziveedu Seeds Ltd., Kaveri Seed Company Ltd., Rasi Seeds Pvt. Ltd., and Advanta India Ltd. (a subsidiary of UPL Limited). International players with a significant presence include Bayer AG, Syngenta Group, Corteva Agriscience, Monsanto India Ltd., and DuPont Pioneer India.

2.3.2 Fertilizers Market

Similar to the Seeds market, the Indian fertilizer market is experiencing a significant transformation, driven by technological innovation and sustainable agricultural practices. The market size is estimated at USD 45.89 billion in 2025 and is expected to reach USD 62.83 billion by 2030, growing at a CAGR of 6.49%. Conventional fertilizers continue to dominate, accounting for approximately 97% of the market share in 2024, largely due to their cost-effectiveness, widespread availability, and government subsidy support, especially for small and marginal farmers. Primary macronutrient variants, such as nitrogenous fertilizers, constitute the largest portion within this segment. The organic fertilizer market, a smaller but rapidly growing segment, is estimated to increase from US\$ 622.6 million in 2025 to US\$ 1,006.3 million by 2032, with a CAGR of 7.1%. This growth is fueled by government support and rising consumer demand for organic products, particularly in North India. Plant-based organic fertilizers hold a significant market share, reflecting a growing preference for sustainable and crop-specific inputs.

Consumption trends show a shift toward precision farming and balanced crop nutrition, boosting demand for complex fertilizers. Soil health reports highlight nutrient deficiencies, driving fertilizer use. Controlled Release Fertilizers (CRFs) are growing in popularity due to their sustained nutrient supply and government support for new technologies. Liquid and water-soluble fertilizers are increasingly used, especially with modern irrigation and high-value crops. Technological advances include digital farming tools like soil monitoring and smart nutrient management, as well as the development of Enhanced Efficiency Fertilizers (EEFs), nano-fertilizers, and tailored nutrient solutions. The distribution landscape is changing with e-commerce and partnerships between leading firms and agtech startups. Integrated farming solutions now blend fertilizer products with advisory and crop monitoring services.

Prominent players in the fertilizer sector include Chambal Fertilizers & Chemicals Ltd., Coromandel International Ltd., Indian Farmers Fertiliser Cooperative Limited (IFFCO), National Fertilizers Ltd (NFL), Nagarjuna Fertilizers and Chemicals Ltd, Rashtriya Chemicals & Fertilizers Limited (RCF), Fertilisers and Chemicals Travancore (FACT), Deepak Fertilisers, Madras Fertilizers, Tata Chemicals Limited, GNFC, GSFC, and EID Parry.



2.3.3 Pesticides Market

The Indian crop protection chemicals market is a critical segment, addressing significant crop losses due to pests, weeds, and diseases. The market size was estimated at USD 2.59 billion in 2025 and is projected to reach USD 3.21 billion by 2030, growing at a CAGR of 4.35%. Consumption patterns reveal a historical reliance on pesticides, which held a dominant 72.5% market share in 2022, primarily due to persistent insect pest challenges. While overall per-hectare pesticide consumption has remained relatively constant, there is a notable rise in herbicide use. Weeds account for a substantial 45% of crop losses, and increasing labor costs for manual weeding have driven farmers towards herbicides. However, the emergence of herbicide-resistant weeds is a growing concern, potentially leading to increased application rates. Insecticide use remains consistent, vital for combating pests like aphids, leafhoppers, and stem borers. Fungicides are crucial for high-value crops, and nematicides and molluscicides are gaining importance in specific regions.

Technological advancements are driving the market, with new insecticides like Flupyrimin (UPL) and Efficon (BASF) targeting pest resistance. Major players are partnering to foster innovation, achieving results such as a 90% reduction in mollusk infestations in Kodagu through molluscicides. Integrated Pest Management (IPM) is increasingly adopted for high-value crops, and demand for sustainable, bio-based solutions is fueling R&D to meet environmental standards. Although biopesticides currently make up just 3–4.2% of the market, their use is expected to grow due to rising environmental awareness. The market remains highly consolidated, dominated by global and domestic agrochemical firms. Mergers and acquisitions strengthen manufacturing, product portfolios, and market reach. Government support, including rural budget allocations, also impacts crop protection chemical pricing.

Leading companies in the crop protection chemicals market include UPL Limited, PI Industries, Bayer CropScience, Sumitomo Chemical Co. Ltd., Dhanuka Agritech, Rallis India Limited, NACL Industries, Sharda Cropchem, Insecticides India, BASF, and Corteva Agriscience.





2.3.4 Irrigation Market

The Indian irrigation systems market is experiencing significant growth, driven by the critical need for efficient water management and sustainable agricultural practices. The market size reached USD 611.93 Million in 2024 and is projected to reach USD 1,225.82 Million by 2033, exhibiting a CAGR of 7.40%. Within this, the smart irrigation market, integrating advanced technologies, is growing even faster, reaching USD 145.70 Million in 2024 and projected to hit USD 506.57 Million by 2033, with a robust CAGR of 14.85%. Similarly, the micro-irrigation systems market, a key component of efficient water use, is expected to reach USD 1.08 Billion by 2032 at a CAGR of 6.5%.

Drip irrigation is gaining ground due to its water-saving efficiency, helped by government initiatives like PMKSY and PDMC that make these systems more accessible for farmers. The shift toward high-value crops requiring precise water control and advances in smart irrigation using IoT and AI are further driving adoption. With India's crop water use among the highest globally, affordable IoT sensors and expanding rural networks support increased automation. Ongoing public and private R&D investments are advancing these technologies as part of India's push for sustainable and modern agriculture.

Major players in the irrigation sector, particularly micro-irrigation, include Jain Irrigation Systems Ltd. (JISL), Netafim India (a subsidiary of Orbia's Precision Agriculture business), Mahindra EPC Irrigation Ltd., Captain Polyplast Ltd., Kisan Irrigation Ltd., The Toro Company, Rain Bird Corporation, Rivulis Irrigation, and Lindsay Corporation.

2.3.5 Farm Machinery Market

The Indian agricultural machinery market is experiencing robust growth, driven by increasing mechanization rates and technological advancements. The market size was valued at USD 14.2 Billion in 2024 and is expected to reach USD 28.9 Billion by 2032, growing at a CAGR of 9.2%. The tractor component market alone generated USD 3.5 billion in 2024, projected to reach USD 6.2 billion by 2032 with a CAGR of 7.5%.

India's mechanization rate rose from 40% in 2016 to 45-50% in 2024 but still trails developed nations at 90%, highlighting growth potential and increased demand for agricultural machinery. Labor shortages due to rural-to-urban migration and employment schemes have driven the need for automation. Technological advances like IoT, AI, and GPS are modernizing farming, with GPS-enabled tractors and automated irrigation becoming common. The market for higher horsepower tractors (50-75 HP) is expanding rapidly because of larger farm sizes, though sub-50 HP tractors remain dominant for their affordability and suitability for small farms. Government support and subsidies, along with easier access to financing, are also crucial enablers. The Indian government increased funding under the Sub-Mission on Agricultural Mechanization (SMAM) by 25% in 2023-24 to ₹1,050 crore (\$140 million). Rising farmer incomes and increased awareness also contribute to this market growth. The emergence of contract farming is expected to further boost the market by providing farmers access to technology, training, and financing through contractors.

Mahindra & Mahindra Limited maintains a strong leadership position in the Indian tractor market, with its two brands (M&M and Swaraj Division) commanding over 40% of the total market in June 2025. International Tractors Ltd. (Sonaliika) and TAFE Limited also hold significant shares. The agricultural tractor segment held the largest market share (80%) in 2024 within the tractor component market, while traditional tractor technology dominated at 60%. Other major players in the tractor market include Escorts Kubota, John Deere India, and CNH Industrial (New Holland, Case IH).

Overall, the Indian agricultural input market is characterized by a dynamic and evolving competitive landscape, featuring a mix of established global conglomerates and strong domestic players. Market shares vary across segments, reflecting different levels of concentration and strategic initiatives.



3. PRIMARY GROWTH DRIVERS

The development of the Indian agricultural input market is primarily influenced by a range of significant factors, fostering a dynamic landscape conducive to innovation and growth. The subsequent section outlines these key drivers, which collectively accelerate progress within this sector.

3.1 Technological Advancements

Technological advancements are revolutionizing Indian agriculture, moving it towards greater efficiency, productivity, and sustainability. The adoption of precision farming, which leverages sensors, drones, satellites, and GPS-guided equipment, allows for optimized management of planting, fertilization, and harvesting, leading to improved yields and reduced input waste. The market is witnessing renewed vigor due to the acceptance of genetically modified (GM) seeds and organic fertilizers, alongside the development of biopesticides and sustainable crop protection solutions.

Artificial Intelligence (AI) and the Internet of Things (IoT) are increasingly integrated into farming operations. AI-powered analytics help optimize input use, predict crop diseases and pest attacks, and provide customized weather-based crop guidance, thereby improving financial health for farmers. IoT-based systems track machinery performance, enabling proactive maintenance and extending equipment life. Drone applications for precision spraying of pesticides and fertilizers are becoming more common, enhancing efficiency and reducing manual labor.

Beyond the farm, blockchain technology is gaining traction for ensuring supply chain integrity, recording and validating every step from seed to plate, which enhances transparency. Agri-tech startups, backed by funds like NABARD's AgriSURE fund, are scaling operations and integrating technology with grassroots farming, further accelerating the adoption of new solutions. These innovations not only boost productivity but also align with the growing demand for sustainable and organic agricultural practices, ensuring long-term viability for the sector.

3.2 Farmer Income Levels

Rising farmer income levels are a crucial catalyst for the agricultural input market. As a result of strong economic growth and enhanced agricultural productivity, the disposable incomes of rural households have steadily increased over recent years. This improved financial standing directly translates into greater purchasing power for farmers, enabling them to invest more in quality agricultural inputs, including advanced machinery, high-yielding seeds, and effective fertilizers and pesticides.

Government initiatives play a significant role in bolstering farmer incomes. Programs such as the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) provide ₹6,000 per year directly to farmers' Aadhaar-seeded bank accounts, ensuring timely financial assistance for input purchases and yield enhancement. The increase in Minimum Support Prices (MSPs) for key crops like paddy and wheat also contributes to income security, encouraging farmers to adopt innovative practices and invest in better inputs. Such measures empower farmers to shift from subsistence farming to more commercial and profitable ventures, driving demand for sophisticated agricultural inputs.





3.3 Rising Food Demand and Population Growth

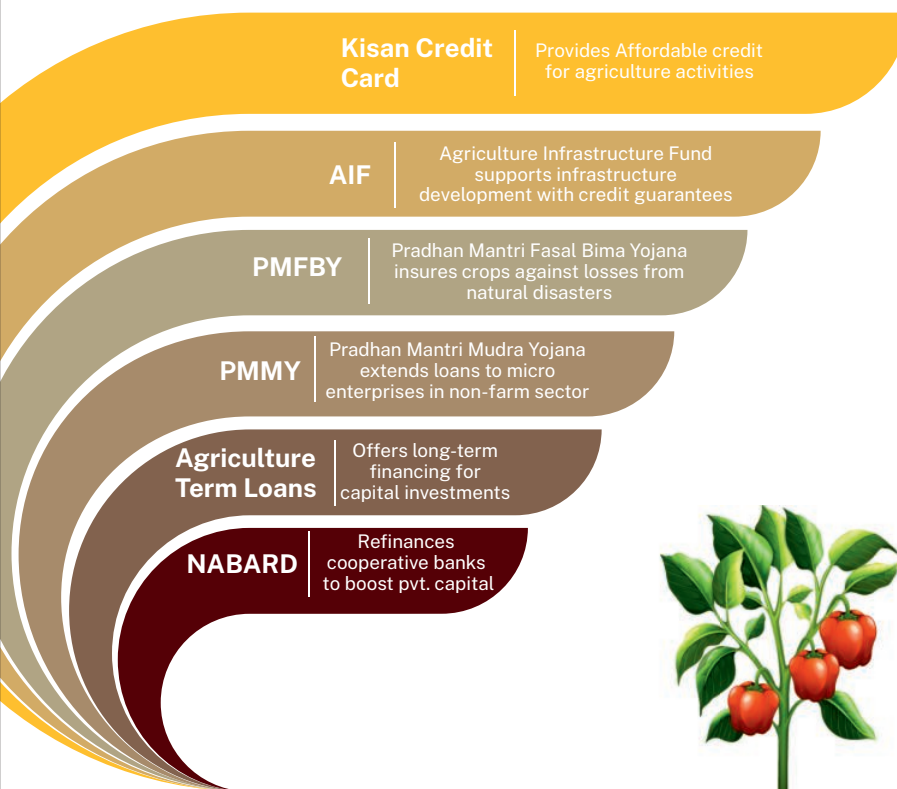
The rising global population, coupled with inflating disposable incomes and elevating standards of living, is leading to a significant increase in demand for food and agricultural products. In India, the total food grain demand is projected to reach 311 million tons by 2030, including specific quantities for rice, wheat, coarse cereals, and pulses. The growing awareness regarding dietary requirements and nutritional needs has also raised the demand for vegetables.

This relentless pressure to feed a growing population directly translates into a heightened demand for agricultural inputs. To meet these burgeoning food requirements, there is an urgent need to enhance agricultural productivity, which in turn necessitates the increased use of high-yielding inputs such as advanced seeds, fertilizers, and pesticides. As urban areas expand, reducing available farmland, the emphasis on intensive and precision farming becomes even more critical to ensure food security. This demographic and consumption trend forms a fundamental, long-term driver for the sustained growth of the agricultural input market.

3.4 Credit Facilities and Financial Support

Access to affordable and timely credit is paramount for Indian farmers to invest in modern agricultural practices, procure quality inputs, and enhance productivity. Agricultural financing in India is facilitated by a multi-institutional framework comprising commercial banks, regional rural banks, cooperative banks, and microfinance institutions. Key public sector credit facilities include the following -

Financial Support for Agriculture



Regarding the support from the private sector, India's agri-fintechs are transforming agricultural financing by using digital tools to improve credit access for farmers who previously lacked formal financial services. These platforms leverage alternative data — such as crop health, soil condition, and transaction history — for credit assessment, insurance, payments, and supply chain solutions. Government initiatives like "agristack," soil-health cards, and satellite land verification support these new models and broaden credit opportunities. Companies such as Aggois, Ayekart, Hesa, Jai Kisan, and Samunnati offer tailored financial products for farmers and MSMEs, boosting transparency, income potential, and risk management. Collaboration between public schemes and private innovators is creating a blended finance ecosystem that enhances financial inclusion and attracts investments. CSR efforts from firms like FMC Ag India and AFC India further promote sustainable farming and community empowerment.





4. PATHWAY TO GROWTH: GOVERNMENT POLICIES, INSTITUTIONAL FUNDING & PRIVATE PLAYERS

Indian agricultural growth has relied on government policy, institutional funding, and private sector involvement. Historically, regulatory barriers, weak infrastructure, and limited support deterred private investment despite growing food demand. Government interventions — such as restrictions on commodity movement and firm size, high taxes, and expensive credit — often discouraged market activity.

Recently, policy reforms have shifted toward promoting investment by reducing commodity restrictions, removing firm size limits, updating State marketing laws (like APMC reforms), and streamlining taxes. These changes mark a move from direct control to creating an enabling environment, with the government now focusing on building ecosystems that harness market mechanisms for sustainable private investment and growth. As previously mentioned, both government and private sector entities have made substantial contributions through favourable policies and credit facilities aimed at advancing the agricultural sector.

India's strong digital infrastructure, exemplified by initiatives like "agristack" and "eNAM," underpins effective public-private collaboration in agriculture. By establishing unified online platforms and databases, the government enables private agri-fintechs and agtechs to innovate more easily. This synergy encourages investment, drives sector efficiency, and supports sustainable growth. The India New Agricultural Policy 2025 reflects this approach, aiming for a technology-driven, inclusive, and sustainable agricultural future.

4.1 Key Policy Initiatives

Several flagship government schemes directly influence the agricultural input market:

- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** This scheme focuses on improving irrigation efficiency, particularly through micro-irrigation systems like drip and sprinkler irrigation. Under the 'Per Drop More Crop' (PDMC) component, financial assistance of 55% for small and marginal farmers and 45% for other farmers is provided for micro-irrigation installation, significantly reducing the initial investment burden and promoting water-efficient agriculture.
- **Agriculture Infrastructure Fund (AIF):** With a ₹1 lakh crore budget, AIF supports warehouses, cold storage, grading, and food processing to reduce post-harvest losses and boost farmers' market access and profits. This makes farming more profitable and increases demand for inputs.
- **Pradhan Mantri Kisan Samman Nidhi (PM-KISAN):** This scheme provides direct financial assistance of ₹6,000 per year in three equal installments to small and marginal farmers. Delivered directly into Aadhaar-seeded bank accounts through Direct Benefit Transfer (DBT), it ensures timely support for farmers to invest in quality inputs and increase yields.
- **Pradhan Mantri Fasal Bima Yojana (PMFBY):** Operating on the "One Nation, One Crop, One Premium" principle, PMFBY offers a comprehensive insurance shield against crop losses caused by unpredictable natural hazards, pests, or diseases. This scheme stabilizes farmers' income and encourages them to adopt innovative practices, reducing the financial risk associated with investing in inputs.
- **National Agriculture Market (e-NAM):** e-NAM is an online portal linking 1,473 mandis in 23 states and 4 union territories, enabling trade of agricultural goods worth ₹4 lakh crore. It offers real-time pricing, lowers transaction costs, and expands farmers' market access to boost income and encourage quality investments.
- **Sub-Mission on Agricultural Mechanization (SMAM):** This initiative promotes agricultural mechanization by providing financial assistance for the purchase of farm machinery. The government boosted funding under SMAM by 25% in 2023-24 to ₹1,050 crore, addressing labor shortages and improving operational efficiency.



- **National Mission on Natural Farming (NMNF) and Paramparagat Krishi Vikas Yojana (PKVY):** These schemes promote chemical-free and natural farming practices, focusing on improving soil health, fertility, and efficient water management. They provide financial assistance for organic inputs like bio-fertilizers and vermicompost, encouraging a shift towards sustainable agriculture.
- **AgriStack:** A government initiative to build a digital agriculture ecosystem, AgriStack aims to facilitate the delivery of digital agriculture services, including responsible advisories and access to quality inputs. It involves databases for farmer ID, farm geotagging, and crop surveys, with potential for integrating private data and blockchain technology for transparency.



4.2 Institutional Credit Facilities

Access to timely and affordable credit is crucial for farmers to purchase essential inputs and adopt modern farming practices.

The institutional credit flow to agriculture has steadily increased over the past decades, with commercial banks emerging as the major source in recent years.

Agricultural credit disbursement reached ₹25.48 lakh crore in FY 2023-24, reflecting an average annual growth rate of over 13% from 2014-15 to 2023-24. For FY 2024-25, the government set a Ground Level Agriculture Credit (GLC) target of ₹ 27.5 lakh crore.

- **Kisan Credit Card (KCC):** Introduced in 1998, the KCC scheme provides hassle-free and affordable credit to farmers for their short-term working capital requirements, enabling them to readily purchase agricultural inputs like seeds, fertilizers, and pesticides. In 2024-25, there were more than 7.7 crore operational KCC accounts. The scheme was extended in 2018-19 to cover working capital needs for fisheries and animal husbandry, with collateral-free loans up to ₹1.6 lakh.
- **Modified Interest Subvention Scheme (MISS):** This scheme provides short-term agri-loans through KCC at a concessional interest rate. Farmers receive an upfront interest subvention of 1.5%, making short-term crop loans up to ₹3 lakh available at an effective interest rate of 7%. An additional 3% Prompt Repayment Incentive (PRI) further reduces the effective interest rate to 4% per annum for timely repayment, significantly easing the financial burden on farmers.

Studies indicate that access to credit significantly increases the productivity and income of farmers, enabling them to make necessary investments in inputs and adopt new technologies. This financial assistance helps farmers overcome the prohibitive costs associated with inputs like seeds, pesticides, fertilizers, and machinery, especially for small and marginal farmers.





4.3 Role of Key Bodies

Several government and quasi-government bodies oversee, research, and promote agricultural inputs:

- **Department of Agriculture and Farmers' Welfare (DA&FW):** Sets agricultural policies, coordinates with states, manages disaster response, and promotes exports.
- **Indian Council of Agricultural Research (ICAR):** Coordinates agricultural research and education, develops crop varieties, conducts productivity studies, and shares findings with farmers.
- **National Institute of Agricultural Marketing (NIAM):** Provides training and research in marketing, connects farmers to markets, and encourages tech adoption for better value.
- **National Institute of Agricultural Extension Management (NIAEM/MANAGE):** Helps improve extension services, implements policy changes, and enhances extension personnel's skills for wider input adoption.
- **Central Insecticides Board and Registration Committee (CIBRC):** Regulates all aspects of insecticide use, ensuring safety, efficacy, and compliance through rigorous review and certification.
- **National Dairy Development Board (NDDB):** Supports dairy cooperatives, finances initiatives, and provides scientific backing to make dairying sustainable and profitable.
- **National Horticulture Board (NHB):** Drives integrated horticulture development, supports advanced technology, post-harvest management, farm mechanization, and quality planting materials.
- **National Oilseeds and Vegetable Oils Development Board (NOVOD):** Promotes growth and self-sufficiency in the oilseeds and vegetable oils industry.
- **National Food Security Mission (NFSM):** Boosts crop production by expanding area, improving yields, encouraging high-yield seeds, irrigation, and balanced input use.
- **National Mission on Agricultural Mechanization (NMAM):** Advances agricultural mechanization mainly through schemes like SMAM to increase equipment use and modernization.

4.4 Potential Policy Changes

India's commitment to transforming its agricultural sector is clearly articulated in the India New Agricultural Policy 2025, a comprehensive framework designed to propel the nation towards sustainable farming, climate resilience, and the integration of cutting-edge technology. This policy envisions a future where the agricultural sector is forward-looking, technologically enabled, inclusive, and sustainable, with ambitious targets set for achievement by 2030 and beyond, ensuring robust food and nutritional security.

The policy outlines several key objectives and initiatives that represent significant potential policy changes, as summarized below:



Reform Name/ Initiative Cluster	Description	Expected Impact
Technology-driven Transformation	Satellite-based monitoring, IoT, AI, drone analytics, unified digital platform, blockchain for supply chain	Real-time crop health data, precise farm management, input optimization, yield forecasting, transparent traceability
Market Strengthening	FPO empowerment, contract farming, direct marketing, modern cold storage, unified digital market platforms	Fairer prices for farmers, reduced wastage, efficient pricing, faster payments, increased farmer income
Sustainable Resource Use	Organic/regenerative farming, water conservation, micro-irrigation, integrated pest/nutrient management, agroforestry, climate-smart crop varieties	Decreased chemical dependence, improved soil health, water efficiency, climate resilience, carbon sequestration, biodiversity gain
Financial Inclusion	Universal affordable crop loans, revamped crop insurance, reimagined MSP, risk-sharing models	Easier credit access, faster and just insurance payouts, reduced farmer vulnerability, stable income
Research & Skill Development	Extension services, farmer training, university-industry collaboration, climate-smart R&D	Upskilling farmers, accelerating technology adoption, developing resilient solutions, fostering innovation ecosystem

Broader sustainability policies are advancing, such as developing clear standards for sustainable agriculture, improving monitoring systems, and increasing diverse financial support through mechanisms like blended finance. Capacity building for all stakeholders — including farmers, financial institutions, and policymakers — is critical. These elements form a holistic strategy to strengthen India's sustainable agriculture finance ecosystem. The integration of environmental aims (like promoting organic farming for soil health) with economic goals (such as productivity and market access) reflects a policy approach that sees both as mutually reinforcing for sustainable growth.

4.5 Sustainability Initiatives

A growing imperative for Indian agriculture is the widespread adoption of sustainable practices, driven by environmental concerns, resource optimization, and consumer demand for organic products.

- **Organic and Natural Farming:** There is a significant shift towards chemical-free cultivation, with schemes like Paramparagat Krishi Vikas Yojana (PKVY) and the National Mission on Natural Farming (NMNF) actively promoting these practices. India is already the 4th largest globally in terms of certified organic area. This involves using natural inputs such as compost, manure, and bio-fertilizers, improving soil health and reducing reliance on synthetic chemicals.
- **Integrated Pest Management (IPM):** IPM lowers reliance on chemical pesticides by using biological controls, crop rotation, and resistant crops, reducing environmental harm and costs.
- **Water Conservation Techniques:** With increasing water scarcity, the adoption of water-efficient farming practices is critical. Drip irrigation and sprinkler systems are being extensively promoted and adopted, significantly reducing water consumption and ensuring year-round farming.



- **Regenerative Agriculture:** Rebuilds soil organic matter with low tillage, cover crops, and crop rotation, improving fertility and cutting dependence on synthetic fertilizers.
- **Renewable Energy Adoption:** Switching to solar irrigation and biogas lowers reliance on fossil fuels, supporting India's clean energy goals in agriculture.

These initiatives aim to achieve long-term agricultural productivity, preserve natural resources, and meet global environmental goals, transforming Indian agriculture into a more resilient and eco-friendly sector.

4.6 Strategic Initiatives of Private Players

Leading agricultural input companies are undertaking various strategic initiatives to enhance their market position, drive innovation, and adapt to evolving agricultural needs:

- **R&D and Product Innovation:** Companies are increasing R&D investments to create new formulations and crop-specific solutions, such as novel insecticides and nano/bio-fertilizers. Seed firms are enhancing breeding programs for local adaptation, disease resistance, and precision agriculture.
- **Sustainable Solutions:** The industry is moving towards eco-friendly options like organic fertilizers, biodegradable media, biopesticides, EEFs, and neem-coated urea to cut chemical use and environmental impact.
- **Partnerships and Acquisitions:** Collaborations and mergers, such as UPL with Bayer and Jain Irrigation with Rivulis, are expanding product portfolios, fostering innovation, and growing market presence.
- **Digital Integration:** Firms are embracing e-commerce, digital marketing, partnerships with agtech startups, and AI-driven platforms (e.g., ITCMAARS) for personalized advisories, pest identification, and better market access via trusted rural networks.
- **Capacity & Backward Integration:** Companies are setting up manufacturing plants and acquiring facilities for cost savings and raw material security, while fertilizer makers focus on operational efficiency.
- **Farmer Training:** Regular workshops and large-scale education initiatives are helping farmers adopt best agronomic practices, eco-friendly pest control, and precision irrigation, especially targeting smallholders and FPOs.
- **Policy Advocacy:** Industry supports reforms for unified seed licensing, streamlined approvals, stronger IP protection, and increased R&D incentives.





5. CHALLENGES AND RESTRAINTS

Despite significant growth and government support, the Indian agricultural input market faces several entrenched challenges that impede its full potential and impact farmer livelihoods, as discussed below -

5.1. Infrastructure Deficiencies

Inadequate infrastructure remains a critical bottleneck for Indian agriculture, affecting productivity, increasing wastage, and limiting profitability for farmers.

- **Inadequate Irrigation Systems:** Dependence on inconsistent rainfall and limited use of modern irrigation restrict crop variety, year-round farming, and yield; much land still uses traditional or rain-fed methods.
- **Insufficient Storage Facilities:** Poor storage, especially for perishables, leads to 20-30% post-harvest losses in some regions due to lack of cold storage and handling facilities, cutting farmer income and supply chain efficiency.
- **Poor Transportation Networks:** Ineffective rural transport raises delivery costs and times, isolating remote farmers from markets and forcing them to accept lower prices from intermediaries.
- **Limited Access to Technology:** Many rural farmers lack modern equipment and knowledge of advanced agricultural practices, hampering adoption of high-yield crops and efficient resource use.

These infrastructure deficiencies collectively contribute to low productivity, high post-harvest losses, farmer distress, and hinder India's potential in agricultural exports by making it challenging to meet international quality standards.

5.2. Credit Access Limitations

While institutional credit flow to agriculture has increased significantly, a substantial portion of Indian farmers, especially small and marginal landholders, still face limitations in accessing adequate and timely credit. Despite initiatives like the Kisan Credit Card (KCC) and Interest Subvention Scheme making credit more affordable, approximately 60% of farmers still lack institutional credit.

The high costs associated with inputs such as quality seeds, pesticides, fertilizers, and modern irrigation systems or farm machinery can be prohibitive for many farmers without sufficient financial resources. This lack of capital prevents them from making necessary investments, leading to suboptimal production outcomes and hindering the adoption of new, more efficient technologies.

Furthermore, there is a pervasive issue of trust deficit regarding the quality of inputs, with counterfeits and lack of brand recognition hindering farmers' ability to access reliable products, even when credit is available. This financial constraint, coupled with a lack of credible information on input quality, can depress farmers' incentives to invest in their businesses, ultimately reducing yields and profits.





5.3 Climate Risks and Vulnerabilities

Indian agriculture is highly vulnerable to the escalating impacts of climate change, facing risks from erratic rainfall patterns, extreme weather events, and deteriorating soil health. The country is among the most susceptible to climate-related disruptions, with extreme weather events occurring on about 90% of days from January to September in recent years.

- **Erratic Rainfall and Extreme Weather:** Unpredictable rainfall patterns, droughts, floods, heat waves, and cyclones severely disrupt crop cycles, threaten livelihoods, and fuel food inflation. The timing of these events is critical, as deviations during key growth stages can result in substantial losses.
- **Soil Health and Crop Productivity:** Climate change exacerbates issues of deteriorating soil health, leading to reduced crop productivity. The nutritional value of produce can also be affected. Vulnerability varies regionally, with arid zones, flood-prone areas, and coastal regions facing heightened risks.
- **Dual Challenge:** Agriculture not only suffers from climate change but also contributes to it through greenhouse gas emissions, crop residue burning, and deforestation. This dual challenge necessitates a focus on climate-resilient agriculture (CRA) practices that enhance resilience, reduce emissions, and sustainably increase productivity.

These climate-related disruptions pose a serious threat to food production and food security, disproportionately affecting small and marginal farmers who suffer income losses from crop damage.

5.4 Raw Material Prices Fluctuation and Supply Chain Disruptions

The agricultural inputs market is highly susceptible to fluctuations in raw material prices and disruptions in global supply chains. Essential raw materials for fertilizers (natural gas for nitrogen, phosphate rock, potash) are subject to price volatilities influenced by geopolitical tensions, trade restrictions, and global market demand. For instance, the heavy reliance on imported traditional urea contributes to high input costs for farmers.

Global supply chain disruptions, such as those experienced during pandemic or due to transportation bottlenecks, further aggravate the problem by increasing production costs and causing delays in the distribution of critical agricultural inputs like fertilizers, pesticides, and seeds. These fluctuations introduce significant uncertainty for farmers and manufacturers, impacting planning, profitability, and the timely availability of necessary inputs.



6. CONCLUSION

The Indian agricultural input market is in a phase of dynamic transformation, characterized by significant growth, technological integration, and a strategic shift towards sustainability. The market, a critical enabler for India's food security and rural economy, is projected to expand substantially, driven by a burgeoning population, increasing food demand, and rising farmer incomes. While the agricultural sector's contribution to GDP has seen a relative decline, its enduring importance as a primary source of livelihood for a vast population and a significant contributor to national exports underscores its foundational role.

Key segments — seeds, fertilizers, pesticides, irrigation, and farm machinery — are witnessing rapid advancements. The dominance of hybrid seeds, the shift towards precision farming and enhanced efficiency fertilizers, the increasing adoption of herbicides and bio-based crop protection, and the widespread integration of smart irrigation and advanced farm machinery highlight a clear trajectory towards modernization. These trends are underpinned by robust technological innovations, including AI, IoT, blockchain, and robotics, which promise to optimize resource use, enhance productivity, and improve decision-making at the farm level.

Despite this positive momentum, the market faces persistent challenges. Infrastructure deficiencies, particularly in irrigation, storage, and transportation, continue to create inefficiencies and post-harvest losses. Access to institutional credit, while improving, remains a barrier for many small and marginal farmers, hindering their ability to invest in necessary inputs and technology. Furthermore, the escalating risks of climate change, manifested in erratic weather patterns and deteriorating soil health, pose a significant threat to agricultural stability and necessitate adaptive strategies.

The Indian government plays a pivotal role in navigating these complexities through comprehensive policy frameworks and credit facilities. Schemes like PMKSY, AIF, PM-KISAN, and PMFBY provide crucial financial, infrastructural, and risk mitigation support. The regulatory oversight of bodies such as ICAR, CIBRC, and NIAM ensures quality, promotes research, and facilitates market linkages. Future policy changes are anticipated to further streamline regulations, incentivize R&D, promote digital infrastructure, and bolster domestic production, all aimed at fostering a more competitive and resilient agricultural ecosystem.

In essence, the Indian agricultural input market is at the cusp of a profound evolution. The interplay of technological innovation, strategic policy interventions, and a growing emphasis on sustainable practices is poised to not only meet the escalating domestic food demand but also solidify India's position as a global agricultural powerhouse, ensuring long-term food security and enhanced prosperity for its farming communities.



References / Sources

- 6W Research
- AARF (Asian Academic Research Foundation)
- Abdul Latif Jameel Poverty Action Lab (J-PAL)
- AgriNext Conference
- AgroPages
- BC Insight (CRU Group)
- Business Research Insights
- Council on Energy, Environment and Water (CEEW)
- Cureus Journals
- Custom Market Insights (CMI)
- Department of Agriculture & Farmers Welfare, Government of India
- Economic and Political Weekly
- ET Edge Insights
- EximPe (Les Amis Pvt. Ltd.)
- Expert Market Research
- Farmonaut
- Food and Agriculture Organization of the United Nations (FAO)
- Global Agriculture
- Global Association of Risk Professionals (GARP)
- GlobeNewswire
- Grand View Research
- HFS Research
- IMARC Group
- Indian Council of Agricultural Research (ICAR)
- Invade Agro Global
- Invest India (DPIIT, Ministry of Commerce & Industry, Government of India)
- Krishi Bazaar
- Lakshmishree
- Manorama Yearbook
- Market Research Future
- Market Research.com
- McKinsey & Company
- Michigan State University - globalEDGE
- Mordor Intelligence LLP
- Munich Personal RePEc Archive (MPRA)
- National Dairy Development Board (NDDB)
- National Institute of Agricultural Extension Management (MANAGE)
- NITI Aayog
- OpenPR
- P&S Intelligence
- Persistence Market Research
- Plant Archives
- Policy Circle
- Press Information Bureau (PIB), Government of India
- Rau's IAS - Compass
- Sharescart.com
- StudyIQ
- TechSci Research
- Verified Market Research
- World Economic Forum

KIRTANE & PANDIT

Pune

5th Floor, Wing A, Gopal House, S.No. 127/1B/ 11,
Plot A1, Kothrud,
Pune – 411 038, India
Contact no : +91 20 67295100 / 25433104
E -mail : kpca@kirtanepandit.com

Mumbai

601, 6th Floor, Earth Vintage, Senapati Bapat
Marg, Dadar West,
Mumbai- 400 028, India
Contact no : 022 69328846 / 47
E -mail : kpcamumbai@kirtanepandit.com

New Delhi

272, Rajdhani Enclave, Pitampura,
Delhi-110034, India
Contact no : +91-96438 74488
E -mail : kpcadelhi@kirtanepandit.com

Bengaluru

No. 63/1, I Floor, Makam Plaza, III Main Road,
18th Cross, Malleshwaram, Bengaluru – 560
055, India
Contact no : 080 23443548 / 23461455
E -mail : kpcabengaluru@kirtanepandit.com

Nashik

Gajra Chambers, Second Floor,
Kamod Nagar, Indira Nagar,
Nashik – 422009, India
Contact no. : +91 253-2386644
E - mail : kpcanashik@kirtanepandit.com

Hyderabad

401 to 405, 4th Floor, Sanatana Eternal,
3-6-108/1, Liberty Road, Himayatnagar,
Hyderabad - 500 029, India
Contact no : +91 99127 41089 / 94400 55917 /
98480 44743 / 98480 46106
E -mail : kpcahyderabad@kirtanepandit.com

Chennai

No. 128, Old No. 34, Unit No. 1, 6th Floor,
Crown Court, Cathedral Road Gopalapuram
Chennai 600086
Contact no : 044 47990259
E -mail : kpcachennai@kirtanepandit.com

Follow Us On:  

 kpca@kirtanepandit.com

 www.kirtanepandit.com

The information presented in this publication is of a general nature and we strongly advise seeking professional advice before making any decisions based on its contents. Kirtane & Pandit holds no responsibility for any loss or consequences arising from actions taken or refrained from, based on the material provided in this publication.

Kirtane & Pandit is a limited liability partnership registered with relevant authorities. Our registered office is located at 5th Floor, Wing A, Gopal House, S.No. 127/1B/11, Plot A1, Kothrud, Pune-411 038, India. We are an independent entity and not directly affiliated with any other organization mentioned in this publication.

Copyright © 2025 Kirtane & Pandit. All rights reserved.