Seeds of Growth

OICCI's Outlook on Pakistan's Agriculture Sector

JULY '26

Disclaimer

This report has been compiled on the basis of inputs provided by specific member companies participating in this joint initiative. The data, statistics, challenges, and recommendations contained herein reflect the operational realities and professional perspectives of the contributing organizations.

Member Company	Crop / Sector
Syngenta Pakistan	Cotton, Crop Protection & Seeds
Corteva Agriscience	Maize / Corn
Bayer Pakistan (Pvt.) Ltd.	Maize / Corn & Crop Protection
PepsiCo Pakistan	Potato
Nestlé Pakistan	Dairy
Pakistan Tobacco Company (PTC)	Tobacco
Engro Corporation	Fertilizers & Soil Health

Copyright Statement

About OICCI

Established in 1860, the Overseas Investors Chamber of Commerce and Industry (OICCI) is Pakistan's oldest and largest chamber of commerce in terms of economic contribution. For over 160 years, OICCI has served as the principal platform representing foreign investors operating in Pakistan — advocating for a stable, transparent, and investment-friendly business environment across all major sectors of the economy.

OICCI's membership comprises 198 companies from over 30 countries, representing 13 key sectors of Pakistan's economy. Twenty-five percent of its members are listed on the Pakistan Stock Exchange, and many are affiliates of Global Fortune 500 companies. This breadth and depth of membership makes OICCI uniquely positioned to speak on behalf of international business at the highest levels of policy dialogue in Pakistan.

OICCI's Role in Pakistan's Economy

OICCI members are not passive observers of Pakistan's economic landscape — they are among its most significant contributors. Collectively, OICCI members have:

- Reinvested over $23 billion in Pakistan since 2015.
- Generated more than $40 billion in annual revenue.
- Paid PKR 8.8 billion in taxes and levies in 2024, equivalent to 30% of the country's total tax revenue.
- Contributed approximately PKR 14 billion in CSR initiatives in 2023–24, directly benefiting over 45 million individuals.

These figures are not simply a measure of corporate scale. They reflect the degree to which OICCI member companies are embedded in Pakistan's economic fabric — as employers, taxpayers, technology providers, and community partners.

Why OICCI Is the Right Voice on Agriculture

Agriculture contributes 22.7% to Pakistan's GDP and employs approximately 37% of its workforce. It is not a peripheral sector — it is the backbone of the national economy and the primary livelihood of rural Pakistan. Yet it is also a sector that has historically been underserved by the kind of structured, evidence-based policy dialogue that can drive real transformation.

This is where OICCI's role becomes important. Several of OICCI's member companies are leading agricultural and food sector multinationals operating directly in Pakistan's farming economy. Companies such as Nestlé, PepsiCo, Bayer, Corteva, and Syngenta are not simply selling products to farmers — they are transferring technology, building farmer capacity, investing in research and development, introducing global best practices, and creating supply chain linkages that connect Pakistani farmers to international markets.

OICCI member companies contribute to Pakistan's agricultural sector in ways that go well beyond commerce:

- **Technology Transfer**: Members introduce internationally proven seed genetics, crop protection technologies, precision agriculture tools, and digital farm management platforms that Pakistani farmers would otherwise not have access to.
- **Farmer Capacity Building:** Members collectively train hundreds of thousands of farmers annually in modern agronomic practices, integrated pest management, sustainable farming, and responsible input use.
- **Standards and Compliance:** As companies that operate across global supply chains, OICCI members bring with them the food safety, environmental, and quality standards of their home

markets. This alignment with international standards is essential if Pakistan's agricultural exports are to compete in high-value markets.

- **Investment and Infrastructure:** OICCI members have reinvested billions of dollars in Pakistan, including in agricultural supply chains, cold storage, processing, farm mechanisation, digital infrastructure, and renewable energy for farm operations. These investments create assets and capabilities that benefit the broader sector, not just the individual company.

- **Policy Advocacy:** OICCI provides a structured, credible channel through which member companies can present evidence-based policy recommendations to government. In a sector as complex and politically sensitive as agriculture, having a trusted intermediary that can aggregate industry perspectives, remove promotional bias, and present recommendations in the national interest is a significant institutional asset.

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Executive Summary

Pakistan's agricultural sector stands at a critical juncture. Contributing 22.7% to GDP, employing around 37% of the workforce, and supporting the livelihoods of more than 60% of the rural population, agriculture remains central to the country's economy and social stability. Yet across most major crops, productivity continues to lag far behind regional and global benchmarks. Regulatory uncertainty is discouraging investment, technology adoption remains uneven, and smallholder farmers remain highly exposed to climate shocks, market volatility, and rising input costs.

Seven leading agricultural companies across key crop sectors came together to provide a practical industry-wide view of the sector's challenges, constraints, and opportunities. The analysis, recommendations, and best practices contained in this report are drawn exclusively from the expertise and operational experience of these participating member companies — each contributing insights specific to their respective crop sector. The report covers Cotton, Maize/Corn, Potato, Dairy, Tobacco, and Fertilizers and Soil Health. It is important to note that this represents the first version of a continuing body of work; additional crops and sectors not covered here will be addressed in subsequent versions of the report as further member contributions are incorporated.

The message is straightforward: Pakistan's agriculture sector can perform much better than it does today. The productivity gap across crops is large, but it can be reduced. Better technology, improved seeds and genetics, stronger farming practices, and modern input systems already exist. The bigger issue is the lack of a stable policy environment that would allow these solutions to spread at scale.

One of the main obstacles is regulatory uncertainty. Delayed approvals, sudden policy changes, and weak implementation are hurting investor confidence and slowing the use of new technologies. This is especially harmful in sectors where growth depends on timely decisions, innovation, and long-term planning.

The cost of doing nothing is already clear. Cotton's decline is not just an agricultural problem; it is affecting the wider economy by increasing imports and weakening the textile sector. Dairy and potato also remain well below their potential because processing, cold storage, and quality input systems are still underdeveloped. These weaknesses are reducing exports, putting pressure on foreign exchange, and limiting rural income growth.

The opportunity, however, is immediate and measurable. With policy stability, science-based regulation, stronger infrastructure, and better market systems, Pakistan can raise yields, attract private investment, reduce import dependence, and build a more competitive and climate-resilient agricultural economy. The potential is not in question. The real challenge is whether policy and execution can move fast enough to unlock it.

International Best Practices & Policy Recommendations

This section synthesises globally recognised agricultural best practices with the specific policy recommendations put forward by each participating member company.

1. Cotton

International Best Practices

Pakistan's cotton output has declined from a peak of approximately 14 million bales to an estimated 6.85 million bales in 2025-26 — 34% below the Federal Committee of Agriculture's target of 10.18 million bales from 2.0 million hectares, with the shortfall attributed to climate change, unexpected rains and floods, pest infestations including White Fly and Pink Bollworm, limited seed technology, and competition from other crops. In contrast, markets such as Turkey employ integrated pest management systems, managed seed development programmes, and structured input supply chains to sustain fiber quality and productivity. Brazil and the United States have maintained strong cotton competitiveness through biotechnology adoption, precision input management, and robust export infrastructure. Restoring Pakistan's cotton to even 8–9 million bales would significantly relieve pressure on the textile sector, which accounts for 60% of the country's export earnings.

A cross-sectoral regulatory comparison illustrates where Pakistan's policy environment diverges most sharply from regional peers and highlights the specific dimensions that most urgently require reform:

Area	Pakistan	India	Bangladesh	Vietnam / China
Price Support	Present for staples	Strong minimum support price system	Food security driven	State directed
Export Policy	Reactive, crop-specific	Frequent policy shifts	Tight for staples	Export promotion
Food Safety / Sanitary and Phytosanitary (SPS) measures	Fragmented	Institutionalised	Strengthening	High, export-aligned
Seed / Tech Regulation	Mixed enforcement	Heavy regulation	Developing	Strong control

Policy Recommendations

- Appoint subject-matter experts—with backgrounds in agri-science and regulation—to key decision-making roles in the Ministry of National Food Security and Research, Federal Seed Certification and Registration Department, and

provincial agriculture departments, in line with international regulatory practice.

- Transition from blanket bans on active ingredients (e.g., Thiamethoxam/TMX) toward science-based Integrated Pest Management) training programmes jointly delivered by extension services, PARC, and private sector companies, ensuring compliance with European Union Maximum Residue Levels (EU MRL) and Codex Alimentarius standards for export-bound crops. The European Union Maximum Residue Levels are legally binding limits on pesticide residues in food products exported to Europe, and compliance is critical for Pakistan because a single violation — as occurred with Basmati rice — can trigger blanket bans, shut down entire export categories, and damage Pakistan's credibility as an agricultural supplier in one of the world's most valuable and standards-driven markets. Whereas, Codex Alimentarius standards set the global baseline for food safety and pesticide residue limits, and Pakistan's failure to align farmer practices and regulatory frameworks with these standards is directly costing it access to high-value export markets across the Middle East, Asia, and beyond.
- Adopt stability testing protocols that align with Food and Agriculture Organisation to allow scientifically validated crop protection products to have their shelf lives extended, reducing millions of dollars in unnecessary input wastage annually.
- Develop a national Agri-Tech and Drone Policy through Ministry of National Food Security and Research and the Civil Aviation Authority (CAA) to streamline licensing, import permissions, and operational approvals for agricultural drones. Drone spraying can reduce water use in crop protection applications by up to 90%.
- Incentivise climate-smart agriculture practices — including regenerative farming, drip irrigation, and crop insurance schemes — and accelerate public-private investment in cold storage and rural logistics infrastructure. Flooding in 2022 alone destroyed over 900,000 hectares of cropland, while post-harvest losses for fruits and vegetables are estimated at 30–40%. Structured cold chain investment would directly reduce these losses and improve farmer resilience to future climate events.

2. Maize / Corn

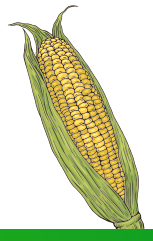
International Best Practices

Pakistan's maize sector has undergone a remarkable transformation: hybrid corn introduction has increased per-acre yields from approximately 40 maunds to 120 maunds—a threefold increase. Despite this, yields of 4.8 tonnes per hectare in FY24 remain below the 5–7 tonnes per hectare benchmarks achieved in the United States and Brazil, where biotechnology-enabled hybrids, precision agronomy, and Integrated Pest Management systems are standard. Countries such as India are rapidly advancing Genetically Modified Organisms and biotech corn adoption, creating competitive advantages in productivity, input efficiency, and climate resilience.

In leading maize-producing nations, integrated pest management systems are not optional add-ons but foundational practice — integrating biological controls, resistant seed varieties, and precisely timed chemical interventions to maximise yields while minimising input costs and environmental impact, a standard Pakistan has yet to institutionalise at scale.

Policy Recommendations

- Finalise and implement Pakistan's Agricultural Biotechnology Policy (completed August 2025, pending Federal Cabinet approval) to unlock the adoption of biotech corn hybrids—including drought-tolerant and insect-protected varieties.
- Introduce time-bound, transparent approval processes for new seed varieties through National Seed Development and Regulatory Authority and Federal Seed Certification and Registration Department, reducing regulatory delays that currently impede technology deployment.
- Deploy digital seed certification and QR/blockchain-based authentication systems to combat counterfeit seed products that undermine both farmer outcomes and intellectual property rights of legitimate technology developers.
- Establish fast-track Intellectual Property dispute resolution mechanisms and simplify pesticide registration processes, including clear timelines for biopesticide approvals.
- Develop a national Integrated Pest Management programme for maize, delivered jointly by government extension services, Pakistan Agricultural Research Council, and the private sector, training farmers on biological controls, resistant varieties, and precise pesticide use — moving away from the current overreliance on chemicals that raises costs and accelerates pest resistance.
- Invest in training for provincial regulators to harmonise standards across provinces, reducing inter-provincial bottlenecks and creating a predictable operating environment for technology investors.



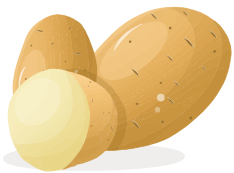
3. Potato

International Best Practices

Pakistan ranks as the tenth largest potato producer globally, yet its average yield of approximately 20 metric tons per hectare is nearly half the global best-practice benchmark. India produced over 56 million metric tons in 2022 compared to Pakistan's 9.8 million, despite sharing comparable growing conditions. Globally, leading potato systems rely on certified seed programmes, precision irrigation, mechanised planting and harvesting, and mandatory crop rotation to sustain soil health. Critically, they are underpinned by two enabling infrastructure layers that Pakistan largely lacks: digital farmer networks connecting growers to real-time weather updates, market price data, best farming practices, and financial services; and IoT-based oil sensors providing precise data on moisture, nutrient levels, and pH — shifting farmer decision-making from guesswork to targeted, data-driven intervention. PepsiCo's investments in microclimate weather stations, Normalized Difference Vegetation Index satellite analytics, and regenerative agriculture across 10,000 acres in Punjab demonstrate that these global standards are replicable at the farm level in Pakistan. It is a satellite-based tool that measures crop health by analysing how plants reflect light, enabling farmers to detect stress, disease, and nutrient deficiencies across large field areas in real time — without physically inspecting every plot.

Policy Recommendations

- Expand the High-Efficiency Irrigation Systems initiative beyond drip systems to include sprinklers, pivots, and hose reel technologies, enabling farmers to select context-appropriate solutions for different field configurations.
- Accelerate seed certification protocols to reduce regulatory delays that currently limit access to certified industrial-grade potato seed.
- Establish national leasing frameworks or public-private machinery banks for modern agricultural equipment—planters, harvesters, optical graders—operated by licensed entities to democratise access.
- Institute mandatory crop rotation policies in core potato-growing areas (Kasur, Okara, Multan, Pakpattan, Sahiwal, Vehari) to combat soil-borne diseases and arrest the progressive degradation of soil health.
- Subsidise or support the rollout of IoT-based soil monitoring tools — including moisture, nutrient, and pH sensors — to potato farmers in core growing districts, enabling precise, data-driven input application and reducing the overuse of fertilizers and water that is currently degrading soil health in key potato belts.
- Deploy digital farmer networks and smart weather alert services, building on models like PepsiCo's 32-square-kilometre microclimate monitoring network, to extend real-time agronomic intelligence to all potato growers in key belts.
- Integrate female farmers into mainstream government support schemes with earmarked quotas for grants, training, and market linkages.



4. Dairy

International Best Practices

Dairy sectors in China, the EU, and North America leverage advanced genetics, precision feed formulation, and integrated disease management to achieve dramatically higher milk yields per cow. China's average annual production stands at 6.14 metric tons per cow—nearly three times Pakistan's 2.18 metric tons per cow—though at a higher feed cost. Countries like New Zealand demonstrate that investment in breeding programs, pasture management, and digital farm tools produces compounding productivity gains over time. Pakistan's dairy sector, which contributes approximately 63.6 percent of value-added agriculture and 14.97 percent to GDP, has significant structural headroom to improve.

Policy Recommendations

- Expand veterinary infrastructure and improve the cold chain for Foot and Mouth Disease vaccine distribution to achieve wider and more reliable vaccination coverage, reducing the persistent disease burden on smallholder herds. Foot and Mouth Disease remains endemic in Pakistan, posing a persistent threat to the dairy sector through recurring outbreaks that suppress milk yields, increase animal mortality, and effectively bar Pakistan's dairy products from premium export markets that require FMD-free certification.
- Establish government-supported artificial insemination centres and facilitate access to high-quality breeding stock to overcome the genetic limitations of indigenous breeds.
- Subsidise solar energy and biogas installations on dairy farms, building on the model already implemented at scale (137 solar and 28 biogas installations supported by Nestlé) to extend climate-smart energy access across the sector.
- Promote high-efficiency irrigation and soil moisture sensing technologies across dairy-linked cropping systems to reduce water waste and improve feed crop quality. Nestle’s current deployment stands at drip irrigation across 243 acres and smart soil moisture sensors on 724 acres — a negligible footprint relative to Pakistan's total dairy-linked cropping area, underscoring the scale of the gap.
- Mandate aflatoxin monitoring protocols for maize grain used in dairy feed, and support investment in mechanical harvesting, grain drying, and silo infrastructure to reduce contamination at source.
- Align with Pakistan Agricultural Research Council and University of Veterinary and Animal Sciences, a public sector university in Pakistan specialising in veterinary medicine, animal sciences, and related agricultural disciplines, and one of Pakistan's leading institutions for dairy and livestock research) to scale regenerative agriculture demonstration farms, integrating soil health, biodiversity, and nutrient management practices.

5. Tobacco

International Best Practices

Globally, competitive tobacco-producing nations deploy a combination of input subsidies, crop insurance mechanisms, and seed innovation to sustain yield quality and farmer income. Countries such as Brazil and Zimbabwe have established structured leaf-buying systems with embedded agronomic support, ensuring consistent supply quality and farmer loyalty. Pakistan leads regional markets in tobacco yield (kg/ha), outperforming India and Bangladesh in Flue Cured Virginia production; however, it has not yet matched the institutional support frameworks of top global producers.

Policy Recommendations

- Introduce 100 percent crop insurance for tobacco farmers to safeguard farm-level income against climate shocks, particularly hailstorms, which have increasingly disrupted cropping cycles.
- Provide targeted subsidies on key agricultural inputs—specifically NPK, DAP, and CAN fertilizers—to offset the 100 percent plus rise in production costs recorded over the past three years.
- Install water pumps in water-scarce growing areas such as Buner and Mansehra to sustain quality production zones.
- Accelerate the registration of seed companies for the tobacco industry to enable import of certified, high-yielding, and disease-resistant varieties. The current lack of post-entry quarantine infrastructure and slow Plant Protection Department responses are bottlenecks that require institutional resolution.
- Establish a level playing field by strengthening enforcement against the unregulated tobacco segment concentrated in KPK and AJK, which operates largely outside the documented tax net, undermining government excise revenue and creating structural competitive disadvantage for compliant producers. Bringing this segment into effective regulatory and fiscal compliance is essential for sector sustainability and revenue integrity. Consider interest-free loan schemes for tobacco farmers to mitigate the impact of rising production costs on export competitiveness.

6. Fertilizers & Soil Health

International Best Practices

Globally, the most productive agricultural systems are built on balanced, precise nutrient management. Enhanced-efficiency fertilizers—coated urea, slow-release formulations, and compound blends—are standard in major markets, reducing nutrient losses and improving crop response per unit of input. Countries like China deploy large-scale digital soil mapping and IoT-based moisture and nutrient sensors to optimise fertilizer application. In Pakistan, nitrogen (urea) dominates at the expense of phosphorus and potassium, creating chronic nutrient imbalances that depress crop quality and yield potential. Correcting this imbalance is one of the highest-return interventions available to the sector.

Policy Recommendations

- Continue and expand subsidies on potassic (potash) and phosphatic (DAP, TSP) fertilizers to incentivise balanced nutrient use, offset high import costs, and improve long-term soil health.
- Promote enhanced-efficiency and coated fertilizers through targeted subsidies and pricing incentives, supported by accelerated public-private partnerships to localise production and reduce costs.
- Establish a localised seed research and development ecosystem, focusing on climate-resilient varieties adapted to Pakistan's soil conditions—particularly for rice, cotton, and wheat.
- Develop a national service provider ecosystem for farm mechanisation given that nearly 90% of farmers own less than 12 acres, shared-service machinery banks are the most viable pathway to modern farming practices at scale.
- Broaden financial inclusion for smallholder farmers by expanding formal credit access and structuring rural finance programmes to reduce dependence on informal, high-cost Artee financing.
- Reverse the proposed reclassification of bio-stimulants and micronutrients from Schedule 31 (fertilizers) to Schedule 38 (plant growth regulators) under Pakistan's customs framework. These inputs play an increasingly critical role in helping crops manage abiotic, temperature, and water stress driven by climate change — making them essential tools for climate adaptation in Pakistan's agricultural system, not optional supplements. They are scientifically and functionally distinct from plant growth regulators and their reclassification is therefore technically incorrect. Beyond the scientific inaccuracy, reclassification would impose a 21% GST on these products, directly contradicting the Government of Pakistan's established policy of exempting agricultural inputs from taxation and placing an additional and unjustified cost burden on farmers already facing rising input prices — further discouraging the adoption of climate-adaptive inputs at precisely the moment when their uptake needs to accelerate.

Crosscutting Policy Recommendations

The following recommendations emerge from a broader sectoral analysis and are included as additional policy considerations. They address gaps suggested by the evidence and overall findings, including areas that are important to sector performance and competitiveness:

1. Establish a National Post-Harvest Loss Reduction Strategy

The data across multiple sectors — 15–40% losses in fruits and vegetables, only 10% of milk processed, potato exports entirely raw — collectively point to post-harvest infrastructure as the single most cross-cutting gap in Pakistan's agricultural value chain. A unified cold chain, logistics, and processing investment framework cutting across all crops would address the root.

2. Create a Unified Agri-Data and Early Warning Platform

PepsiCo has microclimate weather stations across 32 km^2. Syngenta has a disease alert system on Cropwise. Engro has soil sampling through UgAi - Engro Fertilizers' digital platform that cuts out middlemen by connecting farmers directly to Engro's supply network. These are parallel, company-specific digital systems serving only their own grower bases. The data implies a strong case for a national shared agri-intelligence platform — consolidating weather, soil, pest, and market data — that all farmers can access regardless of which company they buy inputs from.

3. Mandate Soil Health Baseline Testing Before Input Subsidies Are Disbursed

The fertilizer section shows chronic nutrient imbalance — farmers over-apply urea and under-apply potash and phosphorus — yet subsidies are disbursed without any conditionality on how inputs are used. Nestlé, Engro, and Syngenta all reference soil health deterioration. A practical recommendation would be to link fertilizer subsidies to basic soil testing, so subsidised inputs address actual nutrient gaps instead of making soil imbalances worse.

4. Introduce Crop-Specific Minimum Quality Standards for Domestic Market

There is a gap between Pakistan's export-grade production and domestic market standards — particularly in potato, cotton, and vegetables. The absence of mandatory domestic quality standards removes the commercial incentive for farmers to invest in better seed, storage, and handling. Export markets force compliance; the domestic market does not. Raising domestic standards would create a floor that lifts quality across the entire value chain.

5. Establish a National Seed Counterfeiting Enforcement Unit

A broader issue highlighted across the sector is weak enforcement of seed and technology protection. Bayer and Corteva both flag counterfeiting of proprietary hybrid genetics as a

serious problem. Unauthorised replication and misuse of proprietary genetics and technologies continue to undermine innovation, reduce investor confidence, and discourage the development and introduction of improved seed systems. A practical response would be to establish a dedicated and technically capable enforcement mechanism focused specifically on seed-related intellectual property violations, rather than relying only on general regulatory structures.

6. Develop a National Female Farmer Registry

PepsiCo's Gender Smart Farms and Women's Economic Empowerment programmes and Engro's Buland initiative both demonstrate measurable productivity gains from structured female farmer engagement. Yet both are private sector programmes reaching a tiny fraction of female agricultural workers. On the public sector level, the government has no systematic record of female farmers — making it impossible to target them with subsidies, training, or credit. A national registry would be the foundational step for any meaningful gender-inclusive agricultural policy.

7. Link Agricultural Tax Policy to Productivity Benchmarks

The Syngenta submission notes that agriculture contributes 23.54% to GDP but does not contribute to tax revenue in a similar proportion. This is a well-known structural issue in Pakistan. A gradual, productivity-linked agricultural taxation could generate revenue to fund the very infrastructure and subsidy programmes, while creating an incentive for farmers to improve yields to offset tax liability.

8. The Digital & Physical Infrastructure Deficit

With only 3.5–4 million smartphone-owning farm households out of 11.7 million total, digital agriculture tools remain inaccessible to the majority. Investment in rural connectivity and cold storage infrastructure is a prerequisite for supply chain transformation.

Challenges and Constraints

The following analysis synthesises the most critical operational and structural constraints facing Pakistan's agricultural sector, organised by crop. These challenges are the primary barriers to realising the growth potential described in the next section. Addressing them requires coordinated policy action, institutional strengthening, and sustained private-sector engagement.

1. Cotton

Pakistan's cotton crisis is among the most consequential agricultural failures of the last decade. Output has fallen from about 14 million bales at its peak to an estimated 6.85 million bales in 2025-26, nearly 34% below target, due to climate shocks, pest attacks, weak seed technology, and crop competition. The result is higher cotton imports, pressure on foreign exchange reserves, lower mill utilization, and direct strain on the textile sector, which generates 60% of Pakistan's export earnings.

The root causes are multiple and interlocking: poor seed quality resulting from the absence of a regulated seed market, blanket bans on effective active ingredients that disrupt pest management without scientific justification, fragmented digital infrastructure limiting farmer access to timely information, and inadequate cold storage constraining value chain efficiency for high-value crops. Post-harvest losses across horticulture and vegetables are estimated at 15–40%, representing a significant and addressable drag on agricultural value creation.

The blanket ban on Thiamethoxam and other active ingredients following an EU rejection of Basmati rice shipments—applied without a structured transition to integrated pest management-based alternatives—exemplifies the regulatory instability that is undermining confidence in Pakistan as an investment destination for agricultural technology companies.

2. Maize / Corn

The principal constraint to further growth in Pakistan's maize sector is regulatory uncertainty and the stalling of the biotechnology policy agenda. The National Biotechnology Policy was finalised in August 2025 but has yet to receive Federal Cabinet approval, effectively blocking the adoption of biotech corn hybrids that could significantly close the yield gap with India and China.

Counterfeiting of proprietary seed genetics by local players—who reproduce multinational hybrid genetics in violation of Plant Breeders' Rights—is a systemic problem that depresses returns on R&D investment and discourages continued technology transfer to Pakistan. Inconsistent interpretation of seed and pesticide regulations across provincial and federal

levels creates unpredictability that deters long-term investment

3. Potato

Pakistan's potato sector is caught in a multi-dimensional productivity trap. National output dropped to 9.8 million metric tonnes in 2024—a 10.4% decline year-on-year—even as domestic consumption and export demand continue to grow. The primary yield constraint is seed quality: less than 5% of production is dedicated to processing-grade varieties, and the local certified seed system is unable to supply the volume and genetic quality required for competitive production.

Climate change is directly disrupting potato cultivation. Rising average temperatures—nearly 2°C above historical norms—are compressing sowing and harvesting windows, intensifying heat stress on tubers, and increasing the incidence of aphids, whiteflies, and fungal diseases. The absence of integrated pest management systems and growing resistance to conventional agrochemicals are leaving smallholder farmers—who form the backbone of the system—exposed and financially vulnerable.

Soil salinity is an emerging but serious long-term constraint. Unsustainable irrigation practices, poor drainage infrastructure, and low soil health awareness are collectively degrading arable land in core potato belts. Currency devaluation has further raised the cost of imported seed, machinery, and fertiliser, making it increasingly difficult for small and mid-sized farmers to access the inputs required for competitive production.

4. Dairy

Pakistan's dairy sector, despite ranking among the top five milk producers globally with 72.43 million tonnes estimated for FY25, is constrained by deep structural inefficiencies. Only 10% of milk is processed into pasteurised or UHT products, and an estimated 20% of total production is lost due to inadequate cold chains, poor collection infrastructure, and post-harvest inefficiencies.

Foot and Mouth Disease remains the most severe disease burden on the sector. The endemic nature of Foot and Mouth Disease, combined with challenges in vaccine cold chain maintenance, poor farmer awareness, and limited veterinary infrastructure, prevents effective disease control. The resulting milk production losses and trade restrictions represent a significant, recurring cost to the sector.

Aflatoxin contamination is a serious and widespread issue in Pakistan. Warm and humid conditions, poor grain drying, limited mechanical harvesting, and the near absence of farm-level silo infrastructure create ideal conditions for mold growth in maize-based dairy feed. When dairy cows consume contaminated maize, the toxin is converted into aflatoxin M1 in milk, creating food safety risks, reducing marketability, and increasing trade-related concerns.

5. Tobacco

The tobacco sector faces a convergence of cost pressures, regulatory asymmetry, and climate risk. Production costs have risen by over 100% in the last three years, driven by Pakistan's macroeconomic challenges including currency depreciation, inflation, and rising input costs. This is compressing farm-level profitability and threatening the competitiveness of Pakistan's tobacco leaf in export markets.

A significant structural challenge is the large unregulated and undocumented segment of the tobacco industry, primarily concentrated in KPK and AJK. This segment avoids excise and tax obligations, undermining government revenue and creating an uneven playing field for compliant producers. Climate-related disruptions—particularly hailstorms—have increasingly damaged standing crops, with no formal insurance mechanism in place to cushion farmer losses.

6. Fertilizers & Soil Health

Pakistan's fertilizer sector faces a paradox: urea stocks stood at approximately 2.8 million MT at December 2025, though the sector has shown signs of recovery with overall fertilizer offtake increasing by 88% year-on-year in March 2026 to 414,000 tonnes, driven by strong urea and DAP demand while potassic and phosphatic fertilizer use remains critically below optimal levels — potash offtake, despite a 39.4% year-on-year increase in March 2026, remains marginal at just 7,000 tonnes for the month, underscoring that nutrient imbalance remains a structural drag on crop quality and soil health across all major cropping systems.

Wheat prices declined 8–10% year-on-year in 2025 due to surplus supply and limited government procurement, reducing farmer incomes by 28–30% and severely curtailing their ability to invest in inputs for subsequent seasons. An early Kharif 2025 water deficit—Indus River System Authority reported a 21% shortfall in April-May due to below-average winter rainfall—compounded planting delays and weakened crop establishment. These climate and price shocks, arriving simultaneously, are symptomatic of the sector's vulnerability to external stresses that are inadequately buffered by current institutional and financial safety nets.

Female farmers, who contribute significantly to agricultural labour, continue to lack access to formal agronomic training. This gap restricts the adoption of modern farming practices and limits women's economic agency within the agricultural value chain.

Economic Contribution and Growth Potential

This section brings together the current economic importance of each crop and the growth potential that could be unlocked through the right policy, investment, and infrastructure support. It shows not only how each sector contributes today, but also how much more value it could generate through higher productivity, better processing, stronger market access, and improved regulation.

1. Cotton

Cotton is structurally central to Pakistan's economy because of its strong links to manufacturing and exports. The textile sector, which depends heavily on domestic cotton supply, accounts for 60% of the country's export earnings. The fall in cotton output from 14 million bales to 5.5 million bales has therefore had economy-wide effects, increasing import costs, weakening textile output, and adding pressure on foreign exchange reserves. Restoring production to 8–9 million bales would reduce import dependence and save an estimated $2–3 billion annually. Cotton's contribution is especially important within an agricultural sector that accounts for 23.54% of GDP and employs around 37% of the workforce. Growth depends on improved seed quality, regulatory stability, and stronger pest management. Precision technologies such as drone-based spraying also offer significant gains, including major reductions in water use in crop protection.

2. Maize / Corn

Maize is one of Pakistan's most dynamic crop sectors and has seen major yield gains over the past three decades through the adoption of hybrid seed, with productivity rising from 40 to 120 maunds per acre. This has improved farmer incomes and supported employment across seed distribution, agronomy services, and processing. Maize is also important for national food security as a key feed input for the poultry and dairy sectors. Acreage is projected to rise from around 1,250,000 acres in 2024 to 1,400,000 acres by 2030. The sector now presents one of the clearest growth opportunities in agriculture. Approval of biotech maize hybrids could unlock a potential USD billion in maize grain and silage exports. With Pakistan's yields at 3–4 tonnes per hectare compared to 5–7 tonnes in the United States and Brazil, the productivity upside remains large. Closing this gap through better genetics and agronomic support would raise farmer incomes, strengthen rural employment, and improve food security.

3. Potato

Pakistan's potato sector is a significant source of farm income and export earnings, contributing approximately $80-200 million annually through exports to markets such as Afghanistan, the Russian Federation, and the UAE. Pakistan ranks as the world's tenth

largest potato producer, but much of the sector's value remains unrealised because exports are still dominated by raw, unprocessed product. Yield gaps, fragmented supply chains, soil salinity, and climate-related losses continue to limit returns for farmers, especially in Punjab's main potato-growing districts. The sector's growth potential lies in three areas: higher productivity, stronger exports, and greater industrial processing. With better seed quality, irrigation efficiency, and crop protection, yields could rise from around 20-23 MT/ha toward 30–35 MT/ha. Greater use of precision farming, certified industrial seed, and improved supply systems would help the sector move from quantity-driven growth to higher-value production and exports.

4. Dairy

Dairy is one of Pakistan's largest agricultural subsectors, contributing approximately 63.6% of value-added agriculture and 14.97% to national GDP. With an estimated 72.43 million tonnes of milk produced in FY25, Pakistan ranks among the world's top five milk producers. The sector supports over 8 million livelihoods, mainly among smallholder farmers, with Punjab accounting for 63% of national production. Buffalo milk makes up around 60% of output and cow milk 37%. Despite this scale, only 10% of milk is processed, which keeps the sector's economic multiplier far below its potential. Significant growth can be unlocked through investment in cold chains, Foot and Mouth Disease control, breed improvement, and better feeding practices. Raising average cow productivity from 2.18 MT/year toward 3.5–4 MT/year could expand milk output substantially without increasing herd size, while reducing the estimated 20% milk loss would add hundreds of millions of litres to effective supply.

5. Tobacco

Tobacco is a high-value, export-oriented crop that delivers strong economic returns relative to the land area it occupies. Pakistan exported 11.03 million kg of tobacco leaf during 2024-25, generating $48.98 million in export earnings, while the sector as a whole generates over PKR280 billion in annual tax revenue through excise duties, VAT, and related levies. It contributes 0.21% to agricultural GDP and 0.05% to total national GDP, while supporting thousands of direct and indirect livelihoods across farming, curing, processing, logistics, and retail. Pakistan leads the region in tobacco yield, with Flue Cured Virginia yields rising to over 4,000 kg/ha through hybrid variety introduction. The primary growth opportunity lies in stabilisation and quality upgrading — with crop insurance, targeted fertilizer subsidies, and formalisation of the unregulated segment, the sector can protect its cost competitiveness and unlock additional tens of billions of rupees in annual tax revenue.

6. Fertilizers & Soil Health

Fertilizers are a foundational input for productivity across all crop sectors, making their economic contribution much broader than direct sales alone. Pakistan's urea market recorded total sales of 6.73 million MT in 2025, up 2.4% year-on-year, although the market moved into surplus. The real economic value of the fertilizer sector lies in its role as the

upstream driver of yield, crop quality, and food security across the wider agricultural economy. Growth potential depends on improving soil nutrition and correcting input imbalances, especially through more balanced use of potassic and phosphatic fertilizers. Better soil health would raise productivity across wheat, rice, cotton, maize, and sugarcane. Expanded retail access, stronger agronomic advisory support, and digital financing tools such as the Kissan Card programme can further strengthen fertilizer use and farm-level productivity.

Conclusion

The Imperative for Action

Pakistan's agriculture sector has real competitive potential. The country is among the world's top five milk producers, the tenth largest potato producer, and a regional leader in tobacco yield. Its maize sector has also shown that major productivity gains are possible within a generation. These are strong signs that the sector can perform much better under the right conditions.

At the same time, the sector faces growing pressure. Climate change is disrupting crop cycles, increasing pest risks, and damaging soil health. Currency depreciation is making imported seed, machinery, and crop protection products more expensive. Regulatory uncertainty is discouraging investment, while weak cold chains, limited processing, and poor market access continue to reduce the value farmers and the economy can capture.

The message is clear: the problems are well known, the solutions already exist, and the growth potential is real. What is needed now is coordinated, consistent, and practical policy action — backed by the active participation of global agricultural players already operating in Pakistan. Multinationals such as Nestlé, PepsiCo, Bayer, Corteva, and Syngenta bring not only capital and technology but proven models, international standards, and global supply chain linkages that Pakistan's domestic sector cannot replicate alone. Their continued and expanded presence in Pakistan is contingent on a regulatory environment that rewards long-term investment — making policy reform not just an agricultural priority but a prerequisite for retaining the global partnerships that are essential to the sector's transformation.

Cross-Cutting Priorities

Across sectors, a few priorities stand out as the most important areas for policy action:

1. Regulatory stability

Regulatory uncertainty is one of the biggest obstacles to agricultural growth. Delayed approvals, shifting rules, stalled registrations, and inconsistent implementation are slowing investment and technology adoption. A more stable, transparent, and science-based regulatory system is essential.

2. Seed system reform

Seed quality sits at the heart of productivity. Weak seed systems, slow variety approvals, poor enforcement, and limited access to certified seed are major reasons for low yields across crops. Reforming the seed system is critical for improving output.

3. Infrastructure for value addition

A large share of output is lost after harvest, while too little is processed or moved through value-added channels. Weak cold chains, poor rural connectivity, limited processing capacity, and weak market links continue to reduce farmer incomes and export potential. Better infrastructure is key to capturing more value.

4. Climate adaptation and water efficiency

Rising temperatures, water stress, erratic rainfall, and soil degradation are becoming major threats to farm productivity. Precision irrigation, better water management, crop rotation, precision spraying, and climate-smart farming practices need to move from pilots to mainstream adoption.

5. Financial inclusion for smallholders

Most farmers operate on a small scale and cannot easily afford better seed, inputs, or machinery. Expanding access to affordable finance, digital support programmes, and shared equipment models is essential for broader productivity gains.

6. Gender inclusion

Women play a major role in agriculture but remain excluded from many formal support systems. Better access to training, finance, and markets for women farmers should be treated as an economic and productivity priority, not only a social one.

The Opportunity Cost of Inaction

The missed opportunities in agriculture are real and immediate. Pakistan is already losing export earnings, farmer income, and economic value because key reforms are delayed. A major maize export opportunity remains untapped. Cotton shortfalls continue to drive costly imports. Large volumes of milk are lost every year because of weak infrastructure. Each year of delay carries a clear cost for the economy.

Pakistan does not need to search for new answers. The solutions are already known and have been proven in practice. What is needed now is consistent, technically sound, and large-scale implementation.

Company Profiles

Pakistan Tobacco Company Limited (PTC)

Pakistan Tobacco Company Limited (PTC) is a publicly listed company operating in Pakistan's tobacco sector, representing the tobacco leaf and processed tobacco segment in this report. PTC is among the country's highest tax contributors, having paid PKR 244 billion in fiscal year 2024. The company operates across key tobacco-growing regions including Swabi, Mardan, Charsadda, Mansehra, Buner, Mianwali, Okara, and Swat, and has supported the introduction of hybrid Flue Cured Virginia varieties that have raised farm-level yields beyond 4,000 kg/ha.

Nestlé Pakistan

Nestlé Pakistan is a subsidiary of the Swiss multinational Nestlé S.A., operating in dairy, nutrition, and beverages. In the dairy sector, Nestlé sources milk from thousands of smallholder farmers in Punjab, providing agronomic support, veterinary guidance, and farm management tools through its Agri-services programme. Since 2022, the company has invested over PKR 6 billion in sustainability projects, trained more than 28,000 male and female farmers, installed 137 solar units and 28 biogas plants on dairy farms, and scaled regenerative agriculture practices across 9,330 acres across 150 farms.

Corteva Agriscience

Corteva Agriscience is a global agricultural inputs company with Asian headquarters in Singapore and business operations in Lahore, Pakistan, along with a research centre at Renala Okara, Sahiwal. Corteva is credited as the first company to introduce commercial hybrid corn seeds in Pakistan, initiating a decades-long productivity transformation in the maize sector. Its operations in Pakistan span over 30 years and include seed provision, agronomic advisory, research and development, and farmer training programmes.

Bayer Pakistan (Pvt.) Ltd.

Bayer Pakistan is a subsidiary of the German life science company Bayer AG, incorporated in Pakistan in 1963. The company's Crop Science division operates research and development facilities in Lahore (Manga and Depalpur), including a dedicated Research Centre and Innovation Hub. Bayer reaches approximately 2 million smallholder farmers annually through its Field Advisory Services, farmer meetings, and product demonstration programmes. The company employs over 400 people directly and indirectly across its Pakistan operations and has contributed to the maize productivity revolution through its high-yielding hybrid seed programme.

Syngenta Pakistan

Syngenta Pakistan (formerly Ciba-Geigy) was incorporated in Pakistan in 1956 and is a subsidiary of Syngenta Group, headquartered in Basel, Switzerland. The company operates across crop protection, seeds, and agri-technology, with a 13% market share in Pakistan's pesticide industry—recognised as market leader by the Competition Commission of Pakistan's 2025 report. Syngenta's Naya Savera franchise network, established in 1998, comprises over 1,000 centres nationwide and serves as a direct-to-farmer agronomic advisory and input distribution channel. The company's Cropwise Grower app has over 1.5 million downloads, with over 1 million registered growers and 7 million acres digitally connected.

PepsiCo Pakistan

PepsiCo Pakistan operates in the food and beverage sector, sourcing potatoes domestically for its snack foods manufacturing. Through its pep+ (PepsiCo Positive) sustainability agenda, the company has developed one of Pakistan's most integrated agri-supply chain programmes, covering precision agriculture, regenerative farming, gender inclusion, and farmer development across Punjab's major potato-growing districts. PepsiCo has deployed microclimate weather stations across 32 square kilometres, converted 10,000 acres to regenerative practices, and operates seven Gender-Smart Farms across Kasur, Okara, Multan, Depalpur, and Sahiwal. The company has engaged 34 female-led smallholder farms through its Women's Economic Empowerment programme.

Engro Corporation

Engro Corporation is one of Pakistan's largest and most diversified conglomerates, with business interests spanning fertilizers, food, energy, petrochemicals, and LNG. Engro Fertilizers Limited (EFERT) is a publicly listed subsidiary of Engro Corporation and one of Pakistan's largest urea producers, recording 2.3 million tonnes of urea sales in 2025 and achieving a full-year market share of 34%. The company's UgAi digital platform connects farmers directly with Engro's distribution network, providing product access, doorstep delivery, and soil sampling services. Engro's Markaz retail centres — operating in Bahawalpur, Muridke, Sahiwal, and Sargodha — have onboarded over 1,300 farmers with a 63% repeat customer rate, indicating strong farm-level uptake. The company also launched the Buland female farmer training programme, which has trained 800 women across Jhang and Pakpattan in crop lifecycle management.

Glossary

Term / Acronym	Definition / Context within Report
AI	Artificial Insemination
AJK	Azad Jammu and Kashmir
CAA	Civil Aviation Authority
CAN	Calcium Ammonium Nitrate
DAP	Di-Ammonium Phosphate
EFERT	Engro Fertilizers Limited
EU MRL	European Union Maximum Residue Levels
FAO	Food and Agriculture Organization
FCV	Flue Cured Virginia
FMD	Foot and Mouth Disease
FSC&RD	Federal Seed Certification and Registration Department
GDP	Gross Domestic Product
GMO	Genetically Modified Organisms
GSF	Gender-Smart Farms
GST	General Sales Tax
HEIS	High-Efficiency Irrigation Systems
IoT	Internet of Things
IP	Intellectual Property
IPM	Integrated Pest Management
IRSA	Indus River System Authority
KPK	Khyber Pakhtunkhwa
MNC	Multinational Corporation
MNFSR	Ministry of National Food Security and Research
MT	Metric Tonne
NDVI	Normalized Difference Vegetation Index
NPK	Complex fertilizer containing Nitrogen, Phosphorus, and Potassium
NSDRA	National Seed Development and Regulatory Authority.
PARC	Pakistan Agricultural Research Council
PBRs	Plant Breeders' Rights
PKR / Rs	Pakistani Rupee
QR	Quick Response
SPS	Sanitary and Phytosanitary measures for food safety and health
TMX	Thiamethoxam
TSP	Triple Super Phosphate
UHT	Ultra-High Temperature
UVAS	University of Veterinary and Animal Sciences
VAT	Value Added Tax
WEE	Women's Economic Empowerment