



Advocacy
Awareness &
Sustainable Services

TRANSFORMING PAKISTAN'S AGRICULTURE & FOOD SYSTEMS

Climate Resilience, Food Security,
Policy Reform & Sustainable
Agricultural Transformation



2025–2026

Policy Gaps, Climate Risks,
Food Security Challenges &
Pathways for Sustainable
Agricultural Transformation



RESILIENT FARMS
SUSTAINABLE FOOD SYSTEMS
SECURE FUTURE



Food Security
for All



Climate
Resilience



Empowered
Communities



Sustainable
Prosperity

Advocacy Awareness & Sustainable Services (AASS)

AASS – Advocacy Awareness & Sustainable Services Organization is committed to advancing sustainable development, climate resilience, social empowerment, food security, policy awareness, and inclusive economic transformation across Pakistan. Through policy dialogue, youth engagement, advocacy initiatives, research, and strategic partnerships, AASS works to address some of Pakistan’s most urgent developmental challenges.

Agriculture remains the backbone of Pakistan’s economy, livelihoods, and food systems. However, climate change, water scarcity, policy fragmentation, weak infrastructure, and economic instability continue to threaten the sector’s long-term sustainability. This report aims to provide a comprehensive overview of Pakistan’s agriculture sector, identify structural and policy gaps, examine climate-related vulnerabilities, and propose pathways toward a resilient, inclusive, and modern agricultural future.

MESSAGE FROM THE EXECUTIVE DIRECTOR

Pakistan's agriculture sector stands at a historic crossroads. While agriculture continues to feed millions, sustain rural livelihoods, and contribute significantly to our economy, the sector faces unprecedented **challenges arising from climate change, floods, water scarcity, food insecurity, rising input costs, and policy inefficiencies.**

The devastating impacts of extreme weather events, particularly the floods and climate shocks witnessed in recent years, have revealed the urgent need for structural reform and climate-resilient agricultural systems. **Farmers across Pakistan are struggling** not only with environmental instability but also with limited access to technology, finance, markets, storage facilities, and institutional support.

At the same time, agriculture presents immense opportunities for Pakistan's future. Innovation, youth engagement, women's empowerment, **climate-smart farming, agri-tech, sustainable water management, and policy modernization can collectively transform Pakistan into a resilient and food-secure nation.**

This report reflects AASS's commitment to promoting evidence-based dialogue, sustainable policy frameworks, and inclusive agricultural development. It is designed to contribute to national conversations on food systems transformation, rural empowerment, climate adaptation, and sustainable economic growth.

We believe the future of Pakistan depends significantly on how effectively we invest in our farmers, our water resources, our rural communities, and our climate resilience today.

Through **collaboration among government institutions, civil society, academia, youth, development partners, and the private sector**, Pakistan can build an agricultural system that is productive, equitable, sustainable, and resilient for generations to come.

Uzma Osho Nasir

Executive Director

AASS – Advocacy Awareness & Sustainable Services Organization

TABLE OF CONTENTS

1. Executive Summary
2. Pakistan Agriculture Sector Overview
3. Major Crops & Production Trends
4. Climate Change & Agricultural Vulnerability
5. Floods, Heatwaves & Environmental Risks
6. Food Security & Nutrition Crisis
7. Water Scarcity & Irrigation Challenges
8. Women & Youth in Agriculture
9. Livestock & Dairy Economy
10. Agri-Tech & Innovation Ecosystem
11. Government Policies & Institutional Analysis
12. Agricultural Trade & Exports
13. Financing & Investment Gaps
14. Provincial Agriculture Analysis
15. Key Structural Challenges
16. Opportunities for Transformation
17. Strategic Recommendations
18. AASS Vision for Agriculture 2030
19. Conclusion
20. References & Annexes

EXECUTIVE SUMMARY

Pakistan's agriculture sector remains central to the country's economy, employing approximately 37–40% of the labor force and contributing significantly to GDP, exports, food production, and rural livelihoods. However, the sector faces mounting pressures due to climate change, declining water availability, population growth, weak governance systems, outdated farming methods, low mechanization, and food insecurity.

The agricultural sector has experienced severe disruptions in recent years due to:

- catastrophic floods,
- erratic rainfall,
- prolonged droughts,
- rising temperatures,
- pest outbreaks,
- soil degradation,
- and increasing production costs.

Climate change has emerged as one of the most significant threats to Pakistan's food systems. Floods, glacier melt, heatwaves, and water stress continue to reduce agricultural productivity and damage rural infrastructure.

Food insecurity and malnutrition remain major national concerns. Millions of Pakistanis face limited access to nutritious food, while inflation continues to reduce purchasing power for vulnerable communities.

At the same time, agriculture offers major opportunities for:

- economic growth,
- export expansion,
- climate-smart innovation,
- youth employment,
- women empowerment,
- green investment,
- and technological transformation.

This report analyzes Pakistan's agriculture sector comprehensively and proposes policy reforms, institutional strengthening, and climate-resilient strategies for sustainable agricultural transformation.

SECTION 1 — OVERVIEW OF PAKISTAN

AGRICULTURE



Agriculture remains one of the most strategically important sectors of Pakistan's economy and continues to play a central role in employment generation, food production, rural livelihoods, industrial development, and national economic stability. Despite decades of structural transformation within the economy, agriculture continues to support millions of households directly and indirectly, particularly in rural areas where farming remains the primary source of income and subsistence.

Pakistan possesses significant agricultural potential due to its fertile plains, diverse climatic zones, extensive irrigation networks, and large rural workforce. The country's agricultural economy is supported primarily by the Indus Basin Irrigation System, one of the largest contiguous irrigation systems in the world, which sustains the cultivation of major crops including wheat, rice, cotton, sugarcane, and maize.

The agriculture sector contributes substantially to Pakistan's Gross Domestic Product (GDP) while also supplying raw materials to key industries such as textiles, food processing, sugar production, leather, dairy, and livestock-based manufacturing. Cotton alone historically formed the backbone of Pakistan's textile industry, which remains one of the country's largest export sectors.

However, despite its importance, Pakistan's agricultural productivity remains below global averages for many major crops. The sector faces multiple structural and environmental challenges including outdated farming methods, fragmented landholdings, poor access to technology, weak institutional support systems, water scarcity, climate variability, insufficient storage infrastructure, and fluctuating government policies.

Agriculture in Pakistan is also highly vulnerable to external shocks. Climate-induced floods, prolonged droughts, heatwaves, pest outbreaks, rising fertilizer costs, fuel inflation, and unstable market conditions continue to threaten farming communities and national food

security. Rural populations are disproportionately affected due to limited adaptive capacity and dependence on agriculture-based livelihoods.

In recent years, concerns surrounding food inflation, declining crop yields, groundwater depletion, and environmental degradation have intensified debates around the need for agricultural reform and climate-resilient food systems. Pakistan's rapidly growing population further increases pressure on agricultural production systems, water resources, and food supply chains.

At the same time, the agriculture sector presents enormous opportunities for economic transformation. Advancements in agricultural technology, climate-smart farming, precision irrigation, digital agriculture platforms, agri-finance, and export-oriented value chains offer pathways toward modernization and resilience. The increasing global demand for sustainable and traceable agricultural products also creates opportunities for Pakistan to strengthen its position in regional and international food markets.

Pakistan's future economic resilience and food security will depend significantly on how effectively the country modernizes its agricultural systems while adapting to the accelerating impacts of climate change.

Agricultural Contribution to the Economy

Agriculture continues to serve as a major pillar of Pakistan's economy through its direct and indirect contributions to employment, exports, industrial production, and food systems. A large proportion of Pakistan's rural population depends on agriculture either directly through farming or indirectly through livestock management, transportation, food processing, agricultural labor, and related services.

The sector provides livelihoods to millions of households across rural regions where alternative employment opportunities remain limited. In provinces such as Punjab and Sindh, agriculture forms the foundation of local economies and supports large-scale agro-industrial networks.

Pakistan's major agricultural outputs include:

- wheat,
- rice,
- cotton,
- sugarcane,
- maize,
- fruits,
- vegetables,
- pulses,
- and livestock products.

The livestock subsector itself contributes significantly to agricultural GDP and remains one of the fastest-growing segments within rural economies. Dairy farming, poultry production,

meat processing, and animal trade support millions of smallholder households across the country.

Agriculture also maintains strong backward and forward linkages with other sectors of the economy. Textile manufacturing depends heavily on domestic cotton production, while food industries rely on wheat, sugarcane, fruits, vegetables, edible oils, and livestock supply chains. Any disruption in agricultural production therefore affects multiple sectors simultaneously.

Provincial Agricultural Landscape

Punjab

Punjab is considered Pakistan's agricultural heartland due to its fertile soils, extensive canal irrigation systems, and large cultivated area. The province dominates wheat production and plays a leading role in rice, sugarcane, maize, and dairy farming.

The province benefits from relatively stronger infrastructure and mechanization compared to other regions. However, Punjab also faces severe groundwater depletion, soil degradation, and increasing climate-related stress.

Major Agricultural Activities:

- wheat cultivation
- rice production
- dairy farming
- sugarcane processing
- poultry industry



Sindh

Sindh plays a crucial role in cotton and rice production while also supporting fisheries, horticulture, and livestock sectors. The province remains highly dependent on the Indus River system and is particularly vulnerable to water shortages and salinity intrusion.

Climate-related floods have severely impacted agricultural areas in Sindh over recent years, damaging croplands, irrigation infrastructure, and rural settlements.

Key Challenges:

- salinity
- waterlogging
- flood vulnerability
- declining freshwater availability



Khyber Pakhtunkhwa (KP)

Khyber Pakhtunkhwa contributes significantly through fruit production, tobacco cultivation, forestry, and livestock systems. Mountainous geography and diverse climatic conditions support horticulture and high-value crops.

The province's agriculture sector faces challenges related to infrastructure gaps, market access, and climate vulnerability, particularly flash floods and changing rainfall patterns.

Major Outputs:

- fruits
- tobacco
- vegetables
- livestock



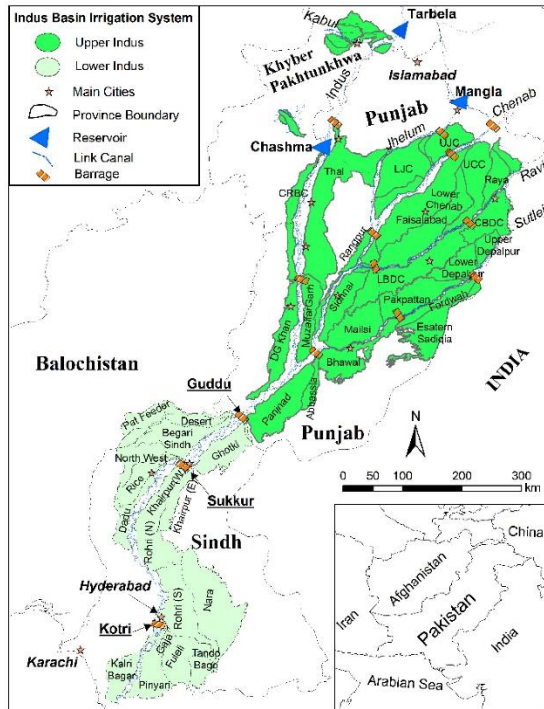
Balochistan

Balochistan possesses vast agricultural potential but faces major structural constraints due to water scarcity, weak infrastructure, and limited investment. The province is known for producing apples, grapes, dates, almonds, and livestock.

Groundwater depletion represents one of the most severe threats to agriculture in Balochistan. Farmers increasingly rely on tube wells, contributing to unsustainable extraction of underground water resources.



Pakistan's Irrigation System



Pakistan's agriculture depends heavily on irrigation due to the country's arid and semi-arid climatic conditions. The Indus Basin Irrigation System supports the majority of cultivated land and remains one of the largest irrigation systems globally.

The system includes:

- dams,
- barrages,
- canals,
- distributaries,

- and watercourses.

While irrigation infrastructure enabled agricultural expansion over decades, the system now faces significant stress from:

- population growth,
- sedimentation,
- water mismanagement,
- climate variability,
- and inefficient water use.

Traditional flood irrigation methods continue to dominate across much of Pakistan, resulting in large-scale water wastage and declining efficiency. Experts increasingly emphasize the need for modern irrigation technologies such as:

- drip irrigation,
- sprinkler systems,
- laser land leveling,
- and precision water management.

Without major reforms in water governance and irrigation efficiency, Pakistan may face severe agricultural water shortages in coming decades.

SECTION 2 — MAJOR CROPS & PRODUCTION

Wheat

Pakistan's primary staple crop and central pillar of food security.

Key Challenges

- heat stress
- water shortages
- seed quality issues
- low productivity
- fertilizer inflation

Rice

Major export crop contributing to foreign exchange earnings.

Emerging Risks

- methane emissions
- flood vulnerability
- salinity
- water-intensive cultivation

Cotton

Critical for Pakistan's textile economy but heavily affected by:

- pest attacks,
- climate stress,
- and declining acreage.

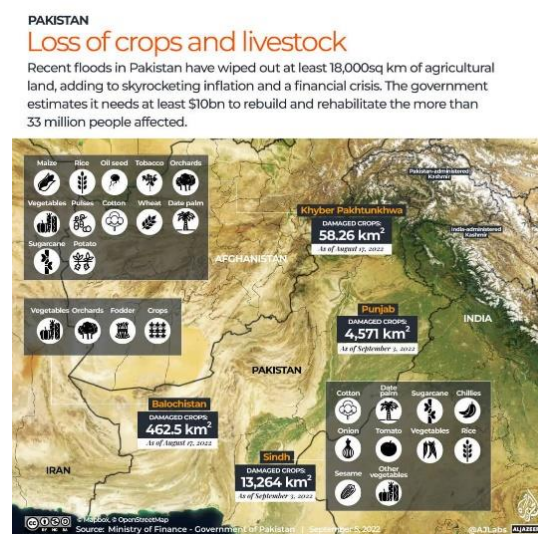
Sugarcane

Highly water-intensive crop contributing to groundwater depletion.

Maize

Increasingly important for poultry feed and commercial agriculture.

SECTION 3 — CLIMATE CHANGE & AGRICULTURAL VULNERABILITY





Climate change poses an existential threat to Pakistan's agriculture and food systems.

Major Climate Risks

- Floods
- Heatwaves
- Droughts
- Glacier melt
- Water scarcity
- Desertification
- Soil degradation

Climate Impacts on Crops

Climate Event	Agricultural Impact
Floods	Crop destruction & soil erosion
Heatwaves	Reduced wheat yields
Droughts	Water stress & livestock losses
Irregular Rainfall	Planting disruptions

Pakistan remains among the countries most vulnerable to climate-related disasters despite contributing minimally to global emissions.

FLOODS & AGRICULTURAL DAMAGE

The 2022 floods severely damaged:

- croplands,
- irrigation systems,
- livestock,
- storage facilities,

- and transportation infrastructure.

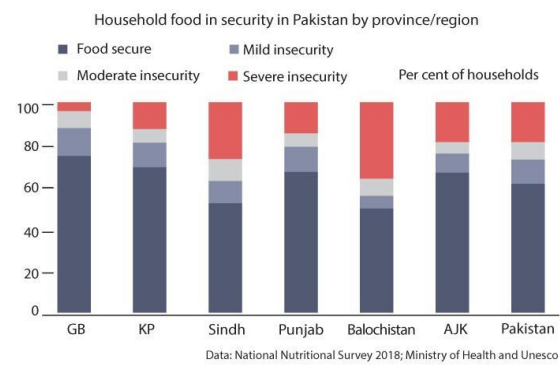
Major Impacts

- destruction of cotton and rice fields
- livestock mortality
- food inflation
- displacement of farming communities
- long-term soil degradation

Most Affected Areas

- Sindh
- Southern Punjab
- Balochistan

SECTION 5 — FOOD SECURITY & NUTRITION



Food Insecurity in Pakistan: Drivers, Challenges, and Nutrition Concerns

Pakistan is currently experiencing a deepening food insecurity crisis that is being shaped by a combination of economic instability, environmental stressors, structural agricultural weaknesses, and systemic inequalities. These factors are not isolated; rather, they interact in ways that intensify vulnerability, particularly among low-income and rural populations.

Key Drivers of Food Insecurity

One of the most significant drivers is **inflation**, particularly in food and fuel prices. Rising inflation reduces household purchasing power, forcing families to spend a larger proportion of their income on basic staples such as wheat, rice, and cooking oil. As prices fluctuate

sharply, lower-income groups are pushed into food compromise—reducing meal quantity or quality.

Climate shocks are another major pressure point. Pakistan is highly exposed to climate variability, including floods, droughts, heatwaves, and shifting monsoon patterns. Events such as catastrophic flooding damage standing crops, destroy stored food, and disrupt rural livelihoods. Over time, climate stress reduces agricultural predictability and increases dependency on market-based food access rather than local production.

Poverty remains a structural root cause. A large proportion of households, particularly in rural and peri-urban areas, live near or below the poverty line. These households lack financial resilience, savings, and access to safety nets, making them highly sensitive to even minor food price increases or income disruptions.

Another critical factor is **low agricultural productivity**. Despite agriculture being a backbone of the economy, yields for major crops remain below global benchmarks due to outdated farming practices, limited mechanization, water inefficiency, soil degradation, and weak extension services. This reduces overall food availability and limits farmer incomes simultaneously.

Finally, **supply chain disruptions** further worsen the situation. Inefficiencies in storage, transport infrastructure, cold chain systems, and market regulation contribute to post-harvest losses and price volatility. In many regions, food passes through multiple intermediaries before reaching consumers, increasing costs and reducing transparency.

Core Food Security Challenges

These drivers manifest in several interrelated social and nutritional challenges.

Child stunting remains one of the most alarming indicators of chronic food insecurity. It reflects long-term undernutrition during early childhood, leading to impaired physical growth and cognitive development. Stunting has lifelong consequences, including reduced educational attainment and lower economic productivity in adulthood.

Malnutrition in Pakistan is not limited to undernourishment; it increasingly reflects a “double burden” where undernutrition coexists with rising obesity in certain populations. In poor communities, however, undernutrition remains dominant, especially among children and women.

Unequal food access is a defining feature of the crisis. Urban centers may experience availability of diverse food items, but affordability remains a barrier. In contrast, rural and remote regions often face both limited availability and affordability constraints, deepening regional disparities.

Rising food prices continue to erode household resilience. Essential staples experience frequent price shocks, often disconnected from local production cycles due to import

dependence, market speculation, and transport inefficiencies. This creates instability in household food planning.

Rural poverty further compounds vulnerability. Agricultural laborers, smallholder farmers, and landless households are particularly exposed to seasonal unemployment, low wages, and climate-induced crop losses. As a result, rural populations often face cyclical hunger periods between harvests.

Nutrition Concerns and Systemic Weaknesses

Beyond food availability, Pakistan faces serious **nutrition-related structural challenges** that undermine human development outcomes.

Micronutrient deficiencies are widespread, particularly deficiencies in iron, vitamin A, zinc, and iodine. These deficiencies may not always manifest as visible hunger but significantly impact immunity, maternal health, and child development outcomes.

There is also a widespread **lack of dietary diversity**. Many households rely heavily on cereal-based diets, especially wheat, with limited consumption of proteins, fruits, vegetables, and dairy products. This dietary imbalance contributes directly to hidden hunger and long-term health complications.

A further concern is the **weak rural nutrition system**, where preventive healthcare, nutrition awareness, and community-based interventions remain underdeveloped. Limited access to nutrition counseling, maternal health services, and school-based nutrition programs reduces early intervention opportunities. This weak system fails to address malnutrition at its root, allowing intergenerational cycles of poor health to persist.

Overall Insight

Taken together, these challenges indicate that food insecurity in Pakistan is not merely a production issue, but a **multi-dimensional crisis involving economics, climate resilience, public health, and governance systems**. Addressing it requires integrated policy responses that improve agricultural productivity, stabilize food markets, strengthen rural infrastructure, and prioritize nutrition-sensitive social protection systems.

SECTION 7 — WOMEN IN AGRICULTURE



Women in Pakistan's Agriculture Sector: Role, Exclusion, and Opportunities

Women constitute a **silent backbone of Pakistan's agricultural economy**, actively participating in nearly every stage of the value chain—from sowing, transplanting, weeding, and harvesting to livestock care, post-harvest processing, and household-level food security management. Despite this substantial contribution, their role remains largely **invisible in formal systems of recognition, ownership, and decision-making**.

Structural Underrepresentation

Although women are deeply embedded in agricultural labor, they remain significantly underrepresented in key institutional and economic dimensions of the sector:

- **Land Ownership:**

In Pakistan, land titles are overwhelmingly held by men due to inheritance practices, cultural norms, and weak enforcement of women's property rights. This exclusion limits women's ability to access credit, government subsidies, and formal agricultural identity.

- **Financing and Credit Access:**
Women farmers face systemic barriers in accessing agricultural loans and financial services. Lack of collateral (often land ownership), limited banking mobility, and low financial literacy restrict their ability to invest in seeds, tools, livestock, or agribusiness ventures.
- **Leadership and Representation:**
Women are rarely represented in farmer organizations, cooperatives, water user associations, or agricultural policymaking bodies. This absence leads to policies that often fail to reflect their lived realities and labor contributions.
- **Extension Services:**
Agricultural extension systems in Pakistan are largely male-dominated. Female farmers frequently lack access to technical guidance, modern farming techniques, pest management knowledge, and climate-resilient practices due to mobility restrictions and gender-insensitive outreach models.
- **Decision-Making Power:**
Even when women contribute significant labor, key decisions related to crop selection, income use, and technology adoption are typically controlled by male household members, limiting women's economic agency.

Key Barriers

1. Limited Mobility

Social norms in many rural regions restrict women's movement outside the household or village. This directly limits their access to markets, training centers, agricultural input suppliers, and institutional services.

2. Financial Exclusion

The formal banking system is not fully accessible to rural women. Requirements such as land ownership, guarantors, and documentation disproportionately exclude them from credit schemes and agricultural financing programs.

3. Cultural and Social Restrictions

Deeply rooted patriarchal norms define agriculture as a male domain in public perception, even though women perform significant agricultural labor. This cultural framing reduces their recognition as "farmers" in official systems.

4. Lack of Training and Capacity Building

Women often receive less access to modern agricultural training, climate-smart agriculture education, mechanization skills, and digital farming tools. Training programs are frequently designed without gender-sensitive delivery models.

Emerging Opportunities and Pathways for Inclusion

Despite these structural challenges, several **high-potential opportunities** are emerging that could transform women's role in agriculture if properly supported:

1. Women-Led Agribusiness Development

There is growing potential for women to engage in **value-added agriculture**, such as dairy processing, organic farming, poultry enterprises, kitchen gardening, and agro-based small enterprises. These models can increase income while operating within mobility constraints.

2. Cooperative Farming Models

Women's agricultural cooperatives can enable shared access to resources such as machinery, seeds, storage facilities, and markets. Cooperative structures also enhance bargaining power and collective decision-making.

3. Digital Inclusion in Agriculture

Mobile-based advisory systems, digital marketplaces, and SMS-based weather and price alerts can bypass mobility barriers and deliver direct agricultural knowledge to women farmers. Expanding rural digital literacy is key to this transformation.

4. Climate-Smart Agricultural Training

With increasing climate shocks in Pakistan, women can play a critical role in climate adaptation strategies if provided with training in drought-resistant crops, water-efficient irrigation methods, soil conservation, and sustainable livestock management.

Concluding Insight

Women in Pakistan's agriculture sector are not peripheral actors—they are **core contributors whose labor sustains rural economies and food systems**. However, their exclusion from land, finance, knowledge systems, and decision-making structures creates a major efficiency gap in the sector.

Unlocking women's full participation is not only a gender equity imperative but also a **strategic economic necessity** for improving agricultural productivity, household resilience, and national food security.

SECTION 8 — YOUTH & AGRI-TECH

Pakistan's agriculture is at a critical transition point. While the sector remains heavily traditional, rising climate pressure, water scarcity, and low productivity are creating a strong need for modernization. In this context, the country's large youth population becomes a strategic advantage—especially if integrated into **AI and digital agriculture ecosystems**.

Youth are naturally more adaptable to digital tools, making them ideal drivers of transformation in farming systems.

Emerging Areas in Agri-Tech

AI in Agriculture

Artificial intelligence is reshaping decision-making in farming by converting raw data into actionable insights.

- AI models analyze soil conditions, weather patterns, and crop health
- Predict pest outbreaks and disease risks before they spread
- Recommend optimal planting and harvesting times
- Support yield forecasting and supply chain planning

In Pakistan, AI is particularly valuable due to climate variability and inconsistent rainfall patterns, where traditional forecasting is often insufficient.

Precision Farming

Precision farming uses data and technology to manage crops at a micro level rather than treating entire fields uniformly.

Key components:

- GPS-based field mapping
- Soil nutrient profiling
- Variable-rate fertilizer application
- Crop health monitoring via satellite/drone imagery

This reduces waste and increases output efficiency. Studies in regional pilot projects suggest precision agriculture can significantly improve productivity when properly adopted .

Drones in Agriculture

Drones are becoming one of the most practical tools for Pakistan's farming landscape.

They enable:

- Aerial crop monitoring for stress detection
- Targeted pesticide spraying (reducing chemical overuse)
- Mapping irrigation inefficiencies
- Damage assessment after floods or heatwaves

Drone-based systems are already being explored in Pakistan for low-cost, scalable precision agriculture solutions .

Digital Marketplaces

Digital platforms connect farmers directly to buyers, reducing reliance on intermediaries.

Benefits include:

- Better price discovery
- Reduced exploitation by middlemen
- Direct access to urban and export markets
- Transparent supply chains

For youth, this creates opportunities in agri-entrepreneurship (apps, logistics, agri-commerce startups).

Smart Irrigation Systems

Water scarcity is one of Pakistan's most urgent agricultural constraints.

Smart irrigation uses:

- Soil moisture sensors
- Automated drip systems
- AI-based irrigation scheduling
- Weather-linked irrigation planning

Impact:

- Significant water savings
- Reduced electricity/diesel costs
- Prevention of overwatering and crop stress

Research shows smart irrigation systems can reduce water use by up to ~40% in controlled environments .

Climate Monitoring Systems

Climate-smart agriculture depends on real-time environmental intelligence.

These systems include:

- Hyperlocal weather stations
- Satellite-based rainfall tracking
- Heatwave and drought prediction tools
- Early warning systems for floods and pests

Such tools are essential for Pakistan, which is among the most climate-vulnerable countries globally, with agriculture highly exposed to extreme weather events .

Agri-Tech Potential in Pakistan (Big Picture)

If properly scaled, agricultural technology can reshape Pakistan’s food system in four major ways:

1. Productivity Gains

- Higher yield per acre
- Better crop quality
- Reduced crop loss from pests and weather

2. Resource Efficiency

- Smarter water usage (critical for Indus Basin stress)
- Reduced fertilizer and pesticide waste
- Optimized input application

3. Climate Resilience

- Early warning systems reduce disaster impact
- Adaptive farming practices for heat, flood, drought
- More stable food supply chains

4. Youth Employment & Innovation

- Agri-tech startups (AI tools, drone services, farm apps)
- Digital extension services
- Remote sensing and data analytics jobs
- Smart farming cooperatives led by youth

Reports highlight that integrating youth into agri-tech ecosystems directly addresses both **unemployment and food insecurity simultaneously**.

Key Insight

Pakistan's agricultural future is no longer just about land and labor—it is about:

data, sensors, intelligence systems, and digitally skilled youth.

If youth are trained and equipped, they can shift agriculture from a subsistence sector into a **high-efficiency, tech-enabled economic engine**.

SECTION 9 — LIVESTOCK & DAIRY ECONOMY



Livestock is one of the **backbone sectors of rural Pakistan's economy**, contributing substantially to agricultural GDP and providing livelihoods to millions of smallholder farmers. Beyond income generation, it also plays a critical role in **food security, nutrition (milk, meat, eggs), and rural employment**, especially for landless households and women who are heavily engaged in animal care and dairy activities.

Major Challenges Facing the Livestock Sector

1. Animal Disease Outbreaks

Frequent outbreaks of diseases such as foot-and-mouth disease (FMD), mastitis, and tick-borne infections severely reduce productivity and livestock survival rates. In many rural areas, **early detection systems are weak**, and vaccination coverage is inconsistent, leading to repeated economic losses for farmers.

2. Fodder Shortages

A major structural issue is the **seasonal and quantitative shortage of quality fodder**. Farmers often rely on low-nutrition crop residues, which directly impacts milk yield and animal growth rates. Climate variability and shrinking arable land further intensify feed insecurity.

3. Poor Veterinary Services

Veterinary infrastructure in rural districts remains underdeveloped. There is a shortage of trained veterinarians, limited mobile animal health units, and insufficient diagnostic facilities. As a result, farmers often delay treatment or rely on informal and unregulated practices, which worsens disease spread.

4. Low Productivity

Despite large livestock populations, productivity per animal remains low compared to global benchmarks. This is due to **genetic limitations, poor feeding practices, inadequate healthcare, and limited adoption of modern husbandry techniques**. The result is a “high quantity, low efficiency” system.

Opportunities for Growth and Transformation

1. Halal Meat Export Potential

Pakistan has a strong comparative advantage in **halal-certified meat production**, given its large livestock base and geographic proximity to Middle Eastern markets. With improved slaughtering standards, certification systems, and export logistics, the sector can significantly increase foreign exchange earnings.

2. Dairy Modernization

The dairy sector offers enormous untapped potential. Introducing **modern chilling systems, quality testing, breed improvement programs, and cooperative dairy models** can

significantly increase milk yield and reduce post-harvest losses. Organized dairy supply chains can also empower rural women economically.

3. Livestock Vaccination Programs

Scaling up **nationwide preventive vaccination campaigns** can drastically reduce mortality and disease burden. Digital tracking systems, mobile veterinary units, and community-based animal health workers can help improve coverage and efficiency.

4. Cold Chain Systems

A critical gap in the value chain is the absence of reliable cold storage and transportation. Developing **cold chain infrastructure for milk and meat preservation** can reduce spoilage, improve food safety, and enable access to distant urban and export markets.

Strategic Outlook

With targeted investment, institutional strengthening, and technology adoption, the livestock sector can shift from subsistence-level activity to a **high-value, climate-resilient agri-economy segment**.

According to global development perspectives shared by institutions such as the Food and Agriculture Organization, improving animal health systems, feed efficiency, and market integration is essential for unlocking livestock's full economic potential in developing countries.

SECTION 10 — GOVERNMENT POLICIES & GAPS

Executive Summary

Pakistan's agricultural policy architecture is composed of multiple national and provincial frameworks, including the **National Food Security Policy, Climate Change Policy, Water Policy**, and provincial agriculture strategies. Collectively, these policies provide a comprehensive conceptual foundation for food security, climate resilience, and resource management.

However, the sector continues to underperform due to **systemic governance and implementation failures rather than policy absence**. Key constraints include institutional fragmentation, weak implementation capacity, outdated extension systems, insufficient climate financing, and inefficiencies in subsidy distribution.

The analysis shows that while policy design is relatively advanced and aligned with global development frameworks (SDGs, climate-smart agriculture principles), **delivery mechanisms remain structurally weak**, limiting impact on productivity, farmer welfare, and resilience.

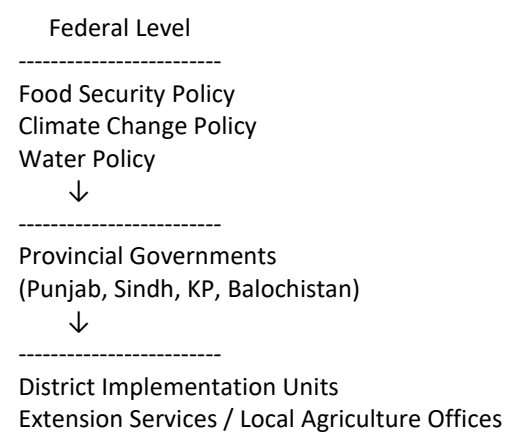
A transition toward **integrated governance, digital extension systems, results-based financing, and coordinated federal–provincial planning** is critical for unlocking agricultural transformation.

1. Existing Policy Architecture

1.1 National and Sectoral Policy Frameworks

Policy Area	Core Objective	Implementation Strength	Key Limitation
National Food Security Policy	Ensure availability, access, and affordability of food	Moderate	Weak provincial coordination
Climate Change Policy	Climate adaptation and mitigation in agriculture	Moderate–Low	Limited financing and integration
Water Policy	Efficient water resource governance	Low–Moderate	Weak enforcement and outdated infrastructure
Provincial Agriculture Frameworks	Regional agricultural development and crop planning	Moderate	Uneven capacity across provinces

Figure 1: Policy Architecture Structure (Simplified System View)



Key Insight:

The system is vertically structured but **horizontally fragmented**, leading to weak coordination across sectors and institutions.

2. Major Policy Gaps

2.1 Structural Policy Constraints

Table 2: Policy Gaps and Systemic Impacts

Policy Gap	Description	Impact on Sector Performance
Weak implementation	Poor enforcement and monitoring of policies	Low policy effectiveness on ground
Institutional fragmentation	Overlapping mandates across ministries	Inefficiency and duplication of efforts
Low research investment	Underfunded R&D institutions	Slow innovation and low productivity growth
Poor coordination	Weak federal-provincial alignment	Policy inconsistency and delays
Subsidy inefficiencies	Poor targeting and leakage	Benefits skewed toward large farmers

2.2 Policy Effectiveness Gap (Impact Lens)

Area	Intended Outcome	Actual Outcome
Food Security	Stable food availability	Persistent inflation and access inequality
Climate Adaptation	Climate-resilient farming systems	Limited adoption at farm level
Water Efficiency	Reduced water wastage	Continued groundwater depletion
Subsidies	Support smallholders	Disproportionate benefit to large farmers

Figure 2: Policy Effectiveness Gap

Policy Design Quality:  High
Institutional Capacity:  Moderate
Ground-Level Implementation:  Low
Final Sector Outcomes:  Low

Key Insight:

There is a **sharp drop from policy design quality to implementation outcomes**, indicating a “delivery system failure.”

3. Institutional Challenges

3.1 Extension System Limitations

Pakistan’s agricultural extension system remains largely **outdated and under-digitized**, relying on traditional field officers with limited technical capacity.

Challenge	Description	Consequence
Outdated extension model	Manual, low-frequency farmer engagement	Low technology adoption
Limited technical capacity	Weak training of extension staff	Poor advisory quality
Low mobility & coverage	Rural outreach constraints	Exclusion of remote farmers

3.2 Climate Finance Constraints

Area	Current Status	Gap
Climate adaptation funding	Limited budget allocation	Insufficient scaling of resilience programs
Risk mitigation systems	Weak early warning systems	High disaster vulnerability
Climate-smart agriculture	Pilot-level adoption	No national-scale rollout

3.3 Farmer Outreach Deficit

Farmer Segment	Level of Inclusion	Key Issue
Smallholders	Low	Limited access to subsidies & credit
Women farmers	Very low	Structural exclusion from programs
Remote rural farmers	Low	Weak institutional presence
Commercial farmers	Moderate	Better access to inputs & information

Figure 3: Institutional Bottleneck Chain

Policy Design → Weak Institutions → Poor Extension → Low Adoption → Low Productivity

4. Key Indicators Dashboard

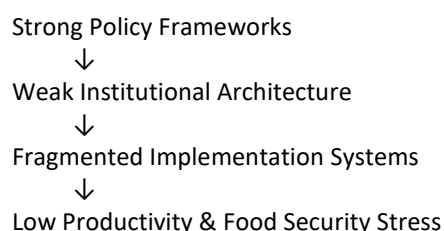
Indicator	Current Status	Benchmark (Good Practice)	Performance Level
Agricultural R&D investment (% of Agri GDP)	Low	1–2%	✗ Weak
Extension worker coverage	Limited	1 agent per 400–500 farmers	✗ Weak
Climate adaptation financing	Very low	Integrated climate budget system	✗ Critical
Subsidy targeting efficiency	Moderate–Low	Digital targeting systems	✗ Weak
Federal-provincial coordination index	Fragmented	Unified planning framework	✗ Weak

5. Strategic Interpretation

The analysis indicates that Pakistan’s agricultural policy system suffers from a **“three-tier structural gap”**:

1. **Policy-Level Adequacy** → Strong frameworks exist
2. **Institutional Weakness** → Fragmented governance and low capacity
3. **Implementation Failure** → Weak delivery at farmer level

Figure 4: System Diagnosis Model



6. Key Message for Reform

To transform agricultural outcomes, Pakistan requires a shift from:

Policy Expansion → Policy Integration and Delivery Reform

Priority reforms include:

- Integrated federal–provincial agricultural governance platform
- Digital extension and advisory systems
- Performance-based subsidy distribution
- Climate-resilient financing mechanisms
- Strengthened agricultural research ecosystem

SECTION 11 — KEY STRUCTURAL CHALLENGES

Challenge	Impact
Water scarcity	Reduced productivity
Climate shocks	Crop destruction
Low mechanization	Inefficiency
Poor storage systems	Post-harvest losses
Limited financing	Low investment
Weak governance	Policy failure

SECTION 12 — INVESTMENT OPPORTUNITIES

Pakistan’s Agri-Food Transformation: High-Potential Investment Pathways

Pakistan’s agriculture sector presents a structurally under-optimized yet high-return investment landscape. Driven by climate vulnerability, rising domestic demand, export potential, and rapid digitalization, the sector is increasingly aligned with global development

finance priorities—particularly climate-smart agriculture, food system resilience, and green transition financing. From a development finance perspective (World Bank / FAO lens), the sector demonstrates strong “investment readiness gaps” rather than lack of opportunity, meaning capital infusion can unlock disproportionate productivity and resilience gains.

12.1 High-Potential Investment Areas

Climate-Smart Agriculture (CSA)

Climate-smart agriculture represents one of the most strategic investment frontiers due to Pakistan’s high exposure to floods, heat stress, and water scarcity. Investments in CSA include drought-resistant seed systems, conservation agriculture, soil health restoration, laser land leveling, and climate-informed advisory systems.

From an economic standpoint, CSA investments generate dual returns: productivity stabilization and climate risk reduction. For example, precision water management and stress-tolerant crop varieties reduce yield volatility while increasing long-term farm income predictability. Institutional investors and donors increasingly prioritize CSA due to its measurable climate mitigation and adaptation co-benefits, particularly in carbon sequestration and reduced methane emissions in rice systems.

Renewable Energy for Farming Systems

Agricultural energy dependency—particularly on diesel-based tube wells and inefficient irrigation systems—creates both a cost burden and a carbon intensity challenge. Renewable energy integration, especially solar-powered irrigation, cold storage, and farm mechanization, represents a scalable investment opportunity.

Solar irrigation systems alone can significantly reduce input costs for farmers while improving irrigation reliability. However, financing gaps remain due to high upfront capital requirements. This creates strong entry points for blended finance models, leasing mechanisms, and public-private energy-agriculture partnerships. From a systems perspective, renewable energy integration also strengthens rural energy access and reduces fossil fuel dependence in agricultural value chains.

Precision Agriculture and Smart Farming Systems

Precision agriculture is emerging as a transformative investment domain driven by digital technologies such as IoT sensors, satellite-based monitoring, AI-driven advisory platforms, and drone-enabled crop surveillance.

Investment opportunities include farm data platforms, weather analytics systems, soil mapping technologies, and decision-support tools that optimize input use (fertilizer, water, pesticides). These systems directly address Pakistan's inefficiencies in input overuse and yield gaps. The return on investment is typically realized through improved productivity per hectare and reduced resource wastage, making it highly attractive for agri-tech venture capital and impact investors.

Cold Storage and Post-Harvest Infrastructure

Pakistan's post-harvest losses remain among the highest in the region due to weak cold chain systems and inadequate storage infrastructure. Investment in modern cold storage, refrigerated logistics, and controlled atmosphere warehouses is critical to reducing food loss and improving price stability.

This segment offers strong commercial viability because it directly links to both domestic food security and export competitiveness (especially horticulture, dairy, and meat sectors). Structured investments in cold chain infrastructure also enable smallholder farmers to access higher-value markets by reducing distress selling and improving shelf-life of perishable goods.

Food Processing and Value Addition Industries

Food processing remains underdeveloped relative to agricultural output, creating a significant value capture gap within the economy. Investment opportunities span dairy processing, fruit and vegetable packaging, grain milling modernization, and meat processing for export compliance.

Industrial upgrading in this sector enhances GDP contribution by shifting the economy from raw commodity exports to processed, branded, and standardized products. This transition is essential for export diversification and compliance with international food safety and phytosanitary standards. The sector is highly suitable for public-private partnerships and export development financing.

Export-Oriented Agriculture

Export agriculture offers high foreign exchange potential, particularly in rice, citrus fruits, mangoes, vegetables, meat, and fisheries. However, Pakistan faces barriers related to quality standards, logistics inefficiencies, certification systems, and traceability infrastructure.

Investment opportunities include export processing zones, certification labs, traceability platforms, and compliance systems aligned with international markets (EU, GCC, and East Asia). Strategic investments in this domain can significantly enhance Pakistan's agricultural trade balance and global competitiveness.

Agri-Finance and Rural Credit Systems

A major structural constraint in Pakistan's agriculture is limited access to formal credit, especially for smallholders. The agri-finance sector offers opportunities for digital lending platforms, credit scoring using satellite and farm data, micro-insurance products, and Islamic finance-based agricultural credit instruments.

Fintech-enabled agri-finance systems reduce transaction costs and expand financial inclusion. Parametric insurance products, in particular, are gaining traction as they allow rapid payouts based on climate triggers (rainfall, temperature thresholds), reducing vulnerability for farmers and lenders alike.

Digital Agriculture Platforms

Digital agriculture ecosystems are rapidly becoming foundational infrastructure for modern farming systems. Investment opportunities include integrated farmer advisory platforms, market linkage applications, supply chain traceability systems, and AI-driven agronomic decision tools.

These platforms improve transparency in pricing, reduce information asymmetry, and strengthen farmer-market linkages. They also enable governments and development agencies to deliver targeted subsidies and extension services more efficiently. The scalability of digital platforms makes them highly attractive for venture capital and development finance institutions.

12.2 Green Financing Potential

Pakistan's agriculture sector is increasingly aligned with global green finance frameworks, opening multiple channels for climate-aligned capital inflows. These include climate funds, multilateral development financing, bilateral donor programs, and private-sector ESG investments.

Climate Finance and Adaptation Funding

Given Pakistan's high vulnerability to climate change, particularly floods, heatwaves, and glacial melt impacts, the country is a strong candidate for adaptation-focused financing.

Climate finance can support irrigation modernization, climate-resilient crops, water conservation systems, and disaster-resilient rural infrastructure.

Donor Partnerships and Development Finance Institutions

Multilateral institutions and bilateral donors are actively investing in food systems transformation, climate resilience, and rural livelihoods. These partnerships typically support large-scale systemic reforms such as agricultural policy modernization, extension system reform, and digital transformation of rural economies.

Such funding often combines grants, concessional loans, and technical assistance, making it highly suitable for institutional strengthening and pilot-to-scale interventions.

Carbon-Smart Agriculture Investments

Carbon markets present a growing opportunity for Pakistan's agriculture sector, particularly through soil carbon sequestration, reduced methane emissions in rice cultivation, and agroforestry systems.

With appropriate measurement, reporting, and verification (MRV) systems, farmers and agribusinesses can potentially generate carbon credits, creating new revenue streams. This area requires investment in digital MRV infrastructure and certification systems but offers long-term financial sustainability aligned with global decarbonization trends.

Public-Private Partnerships (PPPs)

PPPs remain a critical mechanism for scaling agricultural infrastructure and services. Priority areas include irrigation modernization, cold chain logistics, seed systems development, and agri-market infrastructure.

Well-structured PPP models can reduce fiscal burden on the state while leveraging private-sector efficiency and innovation. Risk-sharing frameworks, viability gap funding, and blended finance structures are essential to attract institutional investors into traditionally high-risk agricultural segments.

Summary Investment Outlook

From a macro-development perspective, Pakistan's agriculture sector sits at the intersection of food security, climate adaptation, and rural economic transformation. The key constraint is not opportunity availability but investment de-risking through policy stability, institutional coordination, and data-driven governance systems. With appropriate financing architecture, the sector can transition from low-productivity subsistence systems to a high-value, climate-resilient, export-oriented agri-economy

SECTION 13 — STRATEGIC RECOMMENDATIONS

This section outlines a multi-stakeholder roadmap to strengthen Pakistan’s agricultural transformation agenda, focusing on systemic reform, climate resilience, productivity enhancement, and inclusive growth. The recommendations are structured across four key actor groups: Government, Private Sector, Development Partners, and Academia, reflecting a coordinated ecosystem approach consistent with global best practices (World Bank / FAO-aligned frameworks).

13.1 Government: Policy Reform and Institutional Strengthening

The Government plays the central role in enabling structural transformation through policy coherence, infrastructure modernization, and institutional capacity building.

A top priority is the **modernization of irrigation systems**, particularly transitioning from inefficient flood irrigation toward precision-based and climate-smart irrigation technologies such as drip and sprinkler systems. Given Pakistan’s high water stress and dependency on canal systems, improving water-use efficiency is critical for long-term agricultural sustainability.

Equally important is the **strengthening of agricultural extension services**, which currently remain under-resourced and outdated. A reformed extension system should integrate digital advisory platforms, mobile-based farmer guidance, and localized climate information services to improve farmer decision-making at scale.

The Government must also prioritize **climate adaptation policy enforcement**, ensuring that existing frameworks translate into actionable provincial and district-level interventions. This includes climate-resilient crop zoning, early warning systems, and disaster-risk financing mechanisms for farmers.

Finally, **increased investment in agricultural research and development (R&D)** is essential. Pakistan’s R&D spending in agriculture remains low compared to regional peers. Scaling innovation in seed development, soil health, pest resistance, and mechanization will directly enhance productivity and resilience.

13.2 Private Sector: Innovation, Investment, and Market Systems

The private sector is a critical driver of innovation, efficiency, and value-chain development in agriculture.

A major opportunity lies in **agri-tech investment**, particularly in digital platforms for supply chain management, precision agriculture tools, AI-based crop monitoring, and farm management systems. These technologies can significantly reduce inefficiencies and improve yield forecasting.

Private actors should also prioritize the development of **cold chain infrastructure systems**, including refrigerated transport, warehousing, and post-harvest storage. This is essential to reduce Pakistan's high post-harvest losses, especially in perishable commodities such as fruits, vegetables, and dairy.

Another key area is **expansion of farmer financing mechanisms**, including microcredit, digital lending platforms, crop insurance products, and input financing schemes. Strengthening rural financial inclusion will enable smallholder farmers to invest in productivity-enhancing technologies.

Overall, the private sector's role should shift from fragmented market participation toward integrated value chain development with stronger backward linkages to farmers.

13.3 Development Partners: Climate Finance and Inclusive Growth Support

International development partners play a catalytic role in bridging financing gaps and introducing global best practices.

A priority area is **climate resilience financing**, particularly for adaptation infrastructure such as flood protection systems, water conservation projects, and drought-resistant agricultural systems. These investments are critical in the context of increasing climate variability in Pakistan.

Development partners should also support **women-focused agriculture programs**, targeting structural barriers faced by women in land access, financial inclusion, mobility, and extension services. Empowering women farmers has direct implications for household nutrition, rural incomes, and social equity.

In addition, **food security partnerships** should focus on strengthening national supply chains, improving nutritional outcomes, and supporting emergency food response systems during climate or economic shocks. Coordinated multi-donor platforms can improve efficiency and reduce duplication across programs.

13.4 Academia: Knowledge Systems and Innovation Ecosystems

Universities and research institutions form the backbone of long-term agricultural innovation and evidence-based policymaking.

A key priority is strengthening **agricultural innovation research**, with a focus on developing climate-resilient crop varieties, sustainable soil management practices, and water-efficient farming systems tailored to Pakistan's agro-ecological zones.

Academia should also expand capacity in **climate modeling and predictive analytics**, enabling better forecasting of droughts, floods, and pest outbreaks. This would significantly improve national preparedness and risk mitigation strategies.

Finally, research institutions must lead the development of **sustainable farming systems**, integrating agroecology, regenerative agriculture, and low-emission farming practices. Stronger collaboration between universities, government, and private sector actors will ensure that research outputs translate into field-level adoption.

13.5 Cross-Cutting Priority: Integrated Agricultural Transformation

Across all stakeholder groups, a unified systems approach is essential. Agricultural transformation cannot be achieved through isolated interventions; it requires synchronized action across policy, technology, finance, and knowledge systems.

A coordinated national framework—linking government reform, private innovation, donor financing, and academic research—will be essential to achieving productivity growth, climate resilience, and food security in Pakistan over the next decade.

AASS VISION FOR AGRICULTURE 2030

Vision of AASS – Advocacy Awareness & Sustainable Services Organization

AASS envisions a Pakistan where the agricultural sector evolves into a **climate-resilient, innovation-driven, and socially inclusive system** capable of ensuring long-term food security, rural prosperity, and environmental sustainability.

At the core of this vision lies the belief that agriculture is not merely an economic activity, but a **strategic pillar of national stability, climate adaptation, and social equity**. In a country increasingly exposed to climate shocks, water stress, and food supply disruptions, AASS advocates for a transformation of agricultural systems into resilient ecosystems that can withstand environmental, economic, and geopolitical pressures.

Climate-Resilient Agriculture and Sustainable Food Systems

AASS envisions a future where Pakistan’s agricultural landscape is fully adapted to climate realities. This includes widespread adoption of **climate-smart agricultural practices**, efficient water management systems, drought-resistant crop varieties, and sustainable land-use planning. Food systems are envisioned to be environmentally sustainable, reducing post-harvest losses, minimizing waste, and strengthening farm-to-market efficiency.

The organization emphasizes that sustainability must extend across the entire value chain—from soil health and production systems to storage, processing, and distribution networks.

Empowered Rural Communities

AASS places rural communities at the center of agricultural transformation. The vision promotes **inclusive rural development**, where smallholder farmers are not marginalized but

are instead integrated into formal markets, supported by infrastructure, training, and institutional access.

Empowerment also includes strengthening rural livelihoods through diversified income opportunities, improved access to services, and resilience-building mechanisms that protect communities from climate-induced shocks and market volatility.

Women and Youth as Drivers of Innovation

A defining pillar of the AASS vision is the active inclusion of **women and youth as primary agents of agricultural innovation**. Women, who form a significant part of the agricultural workforce, are envisioned to have equitable access to land, credit, training, and leadership opportunities.

Similarly, youth are positioned as catalysts for transformation through **agri-tech innovation**, digital agriculture platforms, precision farming, artificial intelligence applications, and modern agribusiness entrepreneurship. This intergenerational approach ensures both continuity and modernization of the sector.

Equitable Access to Technology, Finance, and Markets

AASS envisions a system where farmers—regardless of scale or geography—have equitable access to **technology, financial services, and market infrastructure**. This includes digital inclusion, affordable agricultural credit systems, insurance mechanisms, and transparent supply chains.

The integration of modern technologies such as satellite-based monitoring, smart irrigation systems, and digital marketplaces is seen as essential for improving productivity, reducing inefficiencies, and enhancing competitiveness in domestic and global markets.

Agriculture as a Pillar of National Security and Social Justice

AASS firmly believes that sustainable agriculture extends beyond production systems. It is directly linked to **national food security, climate resilience, and socio-economic stability**. In this context, agricultural transformation is framed as a strategic necessity for safeguarding national interests.

At the same time, the vision embeds agriculture within a **social justice framework**, recognizing that inequality in land ownership, access to resources, and market participation must be addressed to ensure fair and inclusive growth

CONCLUSION

Pakistan's agriculture sector is currently at a critical inflection point, where longstanding structural weaknesses are being intensified by accelerating climate, economic, and governance pressures. The sector, which remains the backbone of rural livelihoods and national food supply, is increasingly exposed to systemic risks that threaten productivity, sustainability, and long-term food security.

Climate change has emerged as one of the most disruptive forces, manifesting through irregular rainfall patterns, prolonged droughts, extreme heatwaves, glacier melt, and intensified flooding events. These shocks are not only reducing crop yields but also destabilizing farming cycles, increasing input costs, and undermining farmer resilience. At the same time, water scarcity—driven by inefficient irrigation systems, outdated water governance frameworks, and rising demand—continues to place immense pressure on an already stressed agricultural base.

Food insecurity remains a persistent and growing concern, shaped by a combination of low agricultural productivity, supply chain inefficiencies, inflationary pressures, and unequal access to nutritious food. Vulnerable populations, particularly in rural and peri-urban areas, are disproportionately affected, with rising malnutrition and limited dietary diversity signaling deeper systemic imbalances in the food system.

Institutional and governance challenges further compound these issues. Fragmented policy implementation, weak coordination between federal and provincial bodies, insufficient agricultural research and development investment, and outdated extension services have collectively constrained the sector's modernization. Farmers—especially smallholders—often remain disconnected from innovation, formal financing systems, and climate adaptation tools, limiting their ability to respond effectively to emerging challenges.

Despite these constraints, Pakistan's agriculture sector also presents significant transformation potential. With its large agrarian base, diverse agro-ecological zones, and growing youth population, the country is well-positioned to adopt climate-smart agriculture, digital farming systems, precision irrigation technologies, and value-added agri-industries. Strategic investments in cold chain infrastructure, agri-processing, renewable energy for agriculture, and export-oriented value chains can significantly enhance productivity and global competitiveness.

However, realizing this potential requires a fundamental shift in how agriculture is governed, financed, and innovated. Institutional reform, stronger policy coherence, increased public and private investment in agricultural R&D, and improved farmer-centric service delivery systems are essential pillars of transformation. Equally important is the integration of climate resilience into all levels of agricultural planning and execution.

The future trajectory of Pakistan's food security, rural livelihoods, and macroeconomic stability will be determined by the decisions taken today. A coordinated, multi-stakeholder approach—bringing together government institutions, development partners, academia,

civil society, farmers, and the private sector—is imperative to drive sustainable agricultural transformation.

In conclusion, Pakistan’s agriculture sector is not only a challenge but also a major opportunity. If managed strategically, it can evolve into a resilient, innovation-driven, and inclusive engine of sustainable development—capable of ensuring food security, strengthening climate resilience, and supporting long-term economic stability for future

A Publication of Advocacy Awareness & Sustainable Services (AASS)

Prepared by: Rania Missal

Program Coordinator

Advocacy Awareness & Sustainable Services (AASS)