

FROM VULNERABILITY TO VITALITY

Building Climate Resilience in Agriculture

 **23%** of GDP & Over **40%** of Labour Force (2/3 of Working Women) 

75% of Export Revenue From Cotton & Agri-Food Products 

LOW PRODUCTIVITY IN AGRICULTURE

 Wheat Yield **50% Lower** than China & **15% Lower** than India

 Cotton Yield **2.3X Lower** than China & **1.7X Lower** than Bangladesh

KEY CHALLENGES

 Rising Population & Food Demand

 Urbanization & Shrinking Farmland

 Increasing Climate Vulnerability

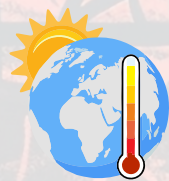
ANNUAL EXTREME CLIMATE IMPACTS

 Floods

 Drought

 Heatwaves

TEMPERATURE RISE FORECAST



Global Temperature Increase

+1.2°C to +1.9°C
Above Pre-Industrial Levels (2025 - 2029)

DEVASTATING FLOODS AND DROUGHTS

2022 Mega Floods

- **Intensity:** **190%** of normal rainfall recorded between July-August.
- **Human Cost:** **1700+** deaths and **12,800+** injuries.
- **Physical damage:** 8 million people displaced across. Sy disents.

\$14.9 B
in direct damages

\$15.2 B
Economic Losses.

\$16.3 B
required for resilient reconstruction.



Agriculture Challenges & Technology

2025 FLOODS

Current Crois:



Recent cloudbursts impacted **6 million** people and claimed **1000+** lives.

Infrastructure & Assets:



12,500+ house damaged
6,500 livestock lost

THE SMALL-HOLDER TRAP

Most of Pakistan's agriculture consists of small-scal farms (<10 hectares).



- Women comprise nearly **70%**
- **12,500+** house damaged
- **6,500** livestock lost



RECENT DROUGHTS

Significant destruction of standing crops threatening immediate **livelihoods**.



Recent Droughts

- Sindh **90%** deficit (near-total lack of winter rain)
- Punjab- **69%** deficit (threatening the rational "breadbasket")

POOR SOIL QUALITY

Pakistan's Soils' health is critically low.

Current Organic Matter:



Current Organic Matter:



~ **0.3%** (critically low)

Increasing soil organic matter by -11% can store an additional **27,000 gallons** of water per acre.

INEFFICIENT WATER MANAGEMENT

Pakistan is mostly arid to semi-arid.

- **75%** of the land receives under **250 mm** of annual rainfall
- **20%** receives less than **120 mm**.



Flat-rate water pricing results **Less than Rs. 3 Billion.**

Solution: Shift from flat-rate "area-based" charges to volumetric pricing.

KEY RECOMMENDATIONS

Lack of Information & Skills

Encourage agriculture digital transformation

Forecasting and dissemination of weather information and early warning alerts.



Limited Access to Finance

Fintech wallets and digital micro-insurance.



Lack of Market Access

Flat-rate water pricing results in the **revenue Gap:**



Intervention

Encourage agricultural digital transformation

- Forecasting and dissemination of weather information and early warning alerts.
- Provision of skills training through digital advisory and training.
- Modernise extension services to ensure responsive delivery of affordable, high quality, and resilient seeds, modern technologies and techniques to farmers in a timely manner.

Invest in R&D

- Strengthen provincial research wings through local and international collaborations to ensure cutting-edge, timely responses to both anticipated and unforeseen climate challenges.

Limited Access to Finance

- Fintech wallets and digital micro-insurance can trigger payouts within hours of a climate event using satellite data, providing an immediate safety net.
- Digital credit enables farmers to secure loans for both short-term inputs and long-term climate-smart investments.

Lack of Market Access

- Simplifies the purchase of seeds and fertilizers with the added security of digital record-keeping.
- Online platforms bypass intermediaries by directly connecting farmers with aggregators, input providers, and end consumers.