CF **CAREC Technology Forum 2025**
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Presented By:

PAKISTAN'S PERSPECTIVE • SESSION 2

Regional Technology Needs Assessment and Cross-Border Collaboration

01

Why it matters

Climate change is a critical risk to economic stability and development—requiring faster, data-driven, and resilient public services.

02

Priority sectors

- Smart agriculture & water management
- Renewable energy and smart grids
- Climate-resilient infrastructure

03

Key enablers

- Digital Public Infrastructure (DPI)
- Data platforms and early warning systems
- AI-driven climate analytics

04

Session 2 Focus

Regional Technology Needs Assessment and Cross-Border Collaboration Opportunities

OPPORTUNITIES FOR REGIONAL COLLABORATION

CAREC Region: Shared Challenges & Needs

Technology readiness varies widely across CAREC—supporting the case for interoperability, shared data, and coordinated investment to scale climate-smart solutions.

01 Common Challenges

- Water scarcity and glacier melt.
- Energy security and infrastructure vulnerability.
- Uneven digital adoption and readiness.

INTERNET USE

96%	91.5%	88%
Kazakhstan (2024)	Georgia (2024)	Azerbaijan (2025)

02 Regional Needs

- Cross-border climate data sharing (early warning).
- Interoperable digital systems (DPI rails).
- Scalable climate-smart technologies and pilots.

GCI 2024	GCI 2024	GCI 2024
96.69	94.04	93.76
Pakistan	Kazakhstan	Azerbaijan

03 Readiness Gaps

- Lower connectivity baselines in some members.
- Digital payments & e-commerce readiness lag (per CAREC digital gap analysis).
- Financing and startup scale-up constraints.

46%	INTERNET USE	57%
Pakistan (2024)		Tajikistan (2025)

FOOTER ✓ Evidence-based gaps make the case for coordinated, cross-border digital investment

CLIMATE & SYSTEM CHALLENGES

Pakistan's Key Climate & System Challenges

Pakistan's challenge is not just climate — it is climate + systems inefficiency.

1 Extreme Climate Events

2022 floods: 30M+ affected, ~$30B in losses.

- Rising heat waves & urban heat stress
- Glacier melt disrupting northern hydrology
- Infrastructure damage & displacement

2 Urban Waste & System Stress

~3.3M tons of plastic waste annually.

- Drainage blockage → urban floods (Karachi, Lahore)
- Open dumping & burning → air pollution
- Floods amplified + public health risk

3 Water & Agriculture

Indus Basin: climate-sensitive water source.

- Inefficient irrigation systems
- Crops exposed to climate variability

4 Weak Data & Coordination

Fragmented climate data across institutions.

- Limited real-time monitoring
- Low interoperability between agencies

✓ **KEY INSIGHT**

Climate + systems inefficiency together demand digital-first, data-driven solutions.

DIGITAL TRANSFORMATION

Digital Transformation in Climate Resilience

Climate resilience today requires data-driven decision making, faster response systems, and targeted delivery of resources.

1 Public Digitization

Open data for climate & environmental reporting.

- Real-time climate datasets made accessible
- Transparency for policy & public accountability
- Foundation for MRV & NDC tracking

2 NDMA Early Warning

IoT hazard sensors & real-time alert systems.

- Multi-hazard monitoring (floods, heat, glaciers)
- Mobile SMS & app-based public alerts
- Integration with provincial disaster authorities

3 Digital Identity

Targeted service & disaster relief delivery.

- NADRA-based verified beneficiary identification
- Fraud-proof climate subsidy distribution

4 Digital Payments

Climate subsidies & EPR payment flows.

- Direct-to-beneficiary climate finance delivery
- EPR (Extended Producer Responsibility) flows

✓ **BUILDING BLOCKS**
Pakistan's DPI stack — Digital ID, Payments, Open Data & NDMA — forms the backbone for climate action.

Technology-Driven Climate Solutions

Technology-Driven Climate Solutions (Pakistan Context)

Technology bridges the gap between climate policy and on-ground execution — six solution pillars for a resilient Pakistan.

01

Digital Early Warning & Risk

- Satellite + IoT flood monitoring.
- AI-driven weather prediction systems.
- Mobile public alert systems.

INTERNET USE

02

Climate Data & MRV Systems

- Integrated climate data dashboards.
- Real-time emissions & waste monitoring.
- Digital MRV for NDC tracking.

03

Smart Urban & Waste Systems

- Digitized waste collection & tracking.
- Plastic traceability systems.
- Circular material recovery technologies.

CAREC FOR REGIONAL CLIMATE RESILIENCE

CAREC for Regional Climate Resilience

Pakistan seeks three key outcomes from CAREC to translate digital capability into regional climate impact.

01

Interoperable Regional Systems

Cross-border data protocols & MRV infrastructure.
Flood forecasting across shared river basins.
Shared data standards for interoperable NDC reporting.

02

Project Preparation & Blended Finance

CSPPF & CIVIC Facility for de-risking private investment.
Multilateral climate finance for digital infrastructure.
PPP models for climate-smart technology scale-up.

03

Shared Cybersecurity Standards

Trusted data exchange across CAREC member states.
Protecting NDMA & energy grid digital assets.
Secure cross-border climate data corridors.

PAKISTAN'S REGIONAL ENGAGEMENT (MOUs)

Building a Collaborative Digital Ecosystem

Partnerships across CAREC

Azerbaijan

ASAN KHIDMET

Digital public service delivery transformation.

Citizen-centric governance model and experience sharing.

ICT COOPERATION (MDDT)

Economic, technical & scientific collaboration in ICT.

Kazakhstan

ASTANA HUB (IGNITE FUND)

Startup ecosystem development and founder support.

Innovation programs and investment attraction.

Market access: connections to regional partners and investors.

MAIDD

Economic, technical & scientific collaboration in ICT.

CAREC-Pakistan

CAREC Digital Corridor

Regional digital infrastructure: Enhancing connectivity through initiatives like the CAREC Digital Corridor.

Secure and seamless cross-border connectivity: Promoting paperless trade and cross-border digital recognition.

Innovation, skills development & ICT cooperation: Fostering startup ecosystems and ICT application innovation

Uzbekistan

MODT

Advanced tech: 5G, AI, IoT, cloud, and cybersecurity.

Smart cities and digital economy collaboration.

Capacity building and digital inclusion programs.

Trust layer: cooperation on secure digital services.

✓ **FOOTER**

Pakistan is actively strengthening digital partnerships across CAREC.

WAY FORWARD

Way Forward: A Connected CAREC Digital Future

From Partnerships to Impact — converting MoUs into regional programs that deliver climate resilience at scale.

1 Scale MoUs into regional initiatives

Translate bilateral cooperation into multi-country delivery mechanisms.

- Cross-border digital infrastructure
- Shared climate data platforms
- Regional startup ecosystem

2 Priority actions (next 12–18 months)

Build interoperability and prove value through joint delivery.

- Develop interoperable DPI frameworks
- Launch joint pilot projects (energy, water, agriculture)
- Promote public–private partnerships

3 Build a regional delivery mechanism

Create a simple structure to coordinate projects, share assets, and measure results.

- Shared governance, standards, and project pipeline
- Common KPIs for resilience outcomes and digital inclusion

4 Call to action: Innovate + finance

Mobilize partners and capital to scale climate-smart technologies across CAREC.

- Establish a CAREC innovation platform
- Mobilize financing for climate technologies

STRATEGIC MESSAGE

✓ **Regional challenges require coordinated, cross-border solutions—built on interoperable digital systems, shared data, and scalable climate-smart innovation.**