Evento finale della 7ª edizione della Community Valore Acqua

Presentazione di Ahmed Hashad

Vice Presidente, Centro Nazionale di Ricerca Idrica per gli Affari della Ricerca, Egitto

Mercoledì 18 marzo 2026

Main partner

Partner

Junior partner

Smart Governance & Sustainability of the New Delta Project

Strategic Response to Water Scarcity

Egypt's Water Reality – Why a New Strategy?

- Severe water scarcity
- Rapid population growth
- Hosting millions of refugees
- Economic development pressures

Source: https://escholarship.org/uc/item/43q236m8

High Risks & Uncertainty

- End of historically stable Nile flow patterns
- Upstream interventions (GERD)
- Climate change impacts
- Increasing uncertainty in water management

Strategic Response: Second Generation of Irrigation

- Flexible systems to absorb shocks
- Maximizing productivity of every water drop
- Integration of advanced technologies
- Resilient irrigation management

The New Delta: A National Landmark

- Reclaiming 362,000 acres
- Largest agricultural water reuse project globally
- Over 96% construction completed
- Transition toward smart management

Technical & Hydraulic Complexity

Complex Water Sources

- Integration of 7 drainage sources
- Treated wastewater reuse
- Capacity: 6.5 million m^3/day
- Complex hydraulic operation

Massive Infrastructure Components

- 114 km transport canal
- Major pumping stations
- Siphons and regulators
- Crossings under roads and railways

Hydraulic Challenges

- Managing large water volumes

- Elevation differences across the system

- Precision control to minimize water losses

- Stable distribution across irrigation areas

Role of NWRC

- Technical consulting and supervision
- Design review
- Hydraulic testing and validation
- Safety and operational assurance

The 7 Pillars of Smart Management

Pillar 1: Hydraulic Capacity & Resilience

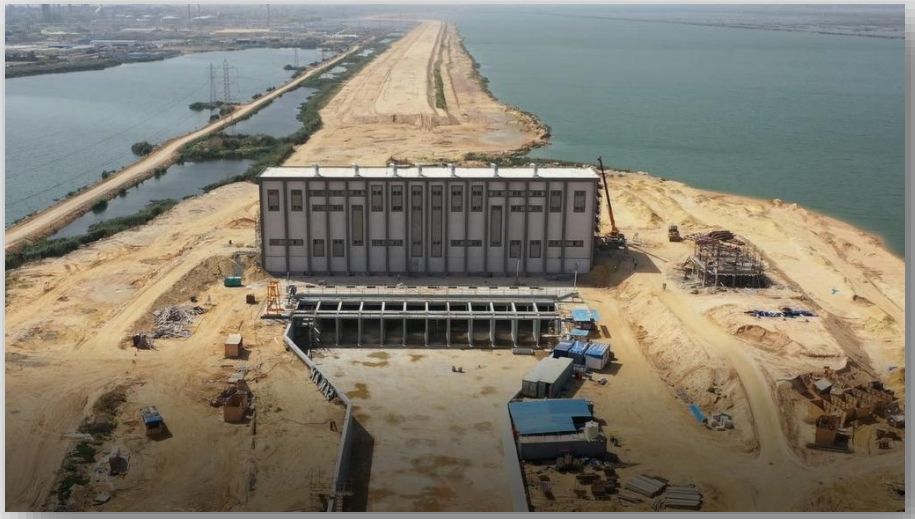
- Ensuring stable flow under peak demand
- Handling sudden supply variations
- Enhancing system flexibility

Pillar 2: Structural Integrity & Asset Safety

- Monitoring cracks and settlement

- Seepage detection

- Sensor-based structural monitoring



Pillar 3: Water Quality & Smart Blending

- Real-time monitoring of salinity
- Pollution control
- Optimized blending of reused water

Pillar 4: Energy Efficiency

- Optimizing pumping station operations
- Reducing electricity consumption
- Lower carbon emissions

Pillar 5: Climate Change Adaptation

- Resilient hydraulic design
- Mitigating evaporation losses
- Preparedness for extreme weather

Pillar 6: Digital Twin Technology

- Virtual replica of the canal system
- Real-time simulation and testing
- Improved operational planning

Pillar 7: Decision Support System (DSS)

- Centralized operational dashboard
- Data-driven decision making
- Integrated monitoring and control

Sustainability & Roadmap

Predictive Maintenance Using AI

- Transition from reactive to predictive maintenance
- Early detection of structural or operational risks
- Reduced maintenance costs

Research-to-Operations (R2O)

- Translating research into operational tools
- Supporting engineers and decision makers
- Continuous innovation

Institutional Capacity Building

- Training digital water management experts
- Developing technical and analytical skills
- Strengthening institutional capabilities

Roadmap for Global Scaling

- New Delta as a global water management model

- Transferable solutions for water-scarce regions

- Opportunities for international collaboration

Conclusion

"**We** don't just build canals; we build

Sustainable & **S**mart systems for the future."

Thanks you…