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XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025

Kingdom of Morocco



Ministry of
Equipment and Water

Sustainable Water Financing in Morocco: Bridging Investment Gaps in a Water-Stressed System

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PRESENTATION PLAN



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General Context



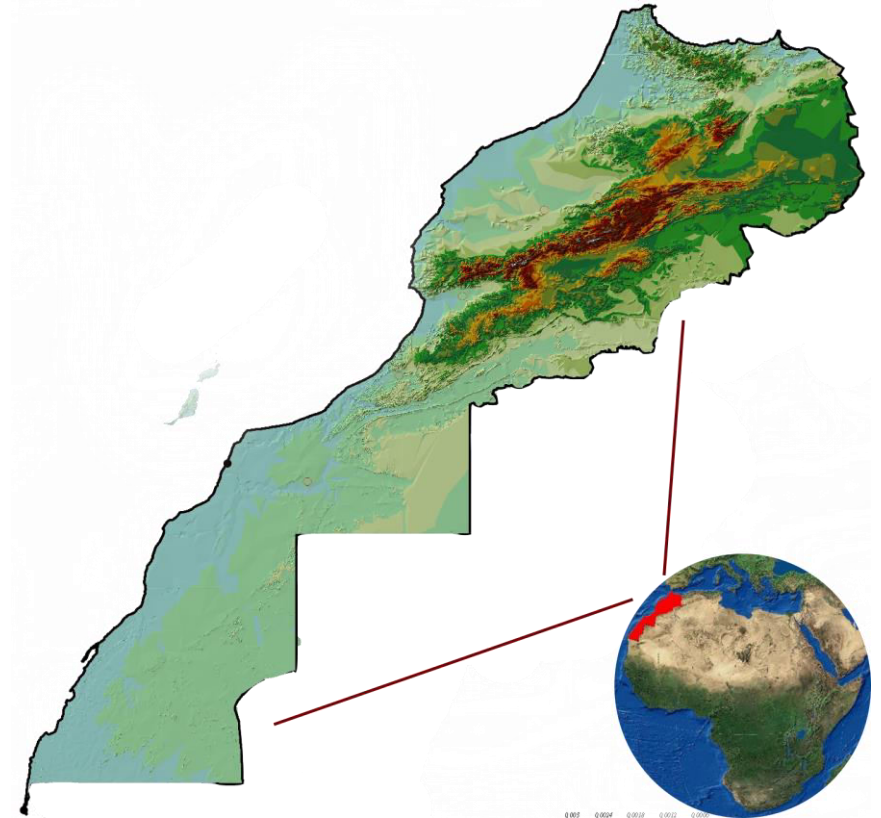
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Morocco's Water Landscape

Morocco faces significant water challenges shaped by its geography and climate. With a population of **36 million inhabitants** across **710,850 km²**, the country possesses **22 billion m³ per year** in total annual water resources.

These resources are divided between **18 billion m³ of surface water** and **4 billion m³ of groundwater**. Agriculture represents a critical economic sector, with agricultural land covering approximately **12% of total area** (9 million hectares).

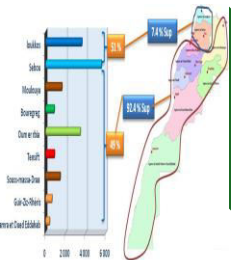
The economy maintains a strong agricultural component alongside mining activities, making water security essential for national development and economic stability in this water-stressed environment.



National Water Sector Context And Challenges



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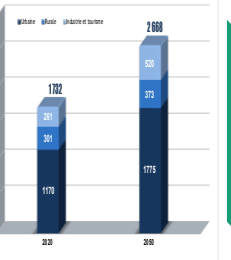
Irregular Distribution

- Water resources are distributed unevenly across time and space, creating regional disparities. Seasonal variations and geographic differences complicate planning and infrastructure development, requiring sophisticated water transfer systems and storage capacity.



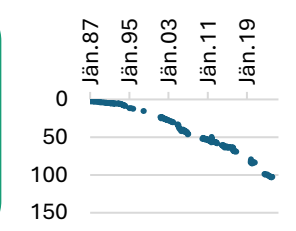
Water Pollution

- Industrial discharge, agricultural runoff, and inadequate wastewater treatment contaminate surface and groundwater. Direct discharge into watercourses degrades water quality, limiting usability and threatening public health.



Growing Water Demand

- Population growth, urbanization, industrial expansion, and agricultural development drive escalating water demand. Meeting these needs while preserving resources requires innovative supply and demand management strategies.



Groundwater Overexploitation

- Excessive extraction of groundwater resources, particularly in agricultural regions, threatens aquifer sustainability. The Jbel Hamra aquifer exemplifies this challenge, with depletion rates exceeding natural recharge.



Climate Change Impacts

- Extreme weather events intensify, alternating between devastating floods and prolonged droughts. The 2009 Gharb Plain flooding illustrates vulnerability to climate variability, demanding resilient infrastructure and adaptive management approaches.



Erosion and Dam Capacity Loss

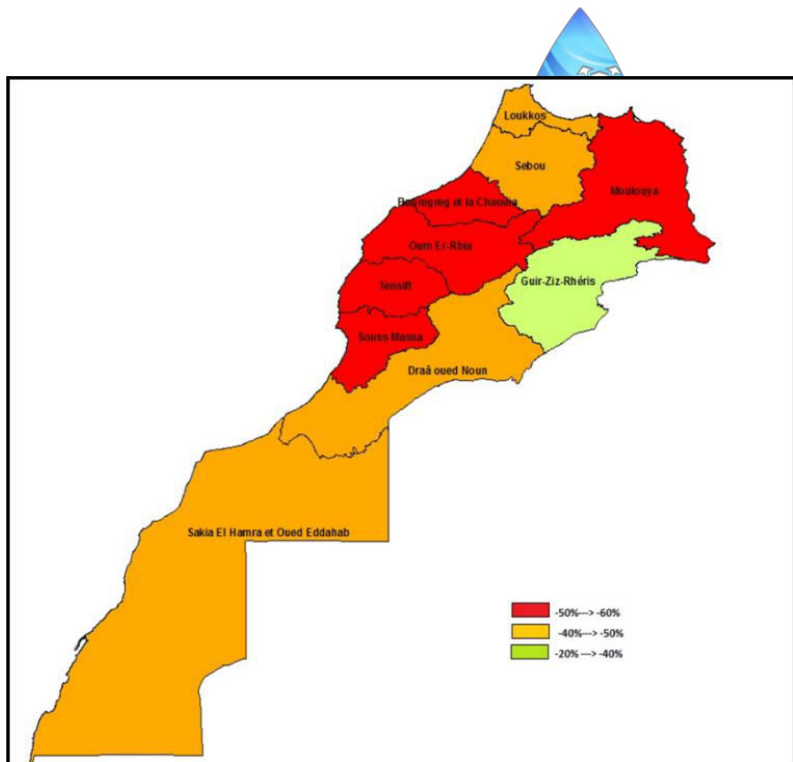
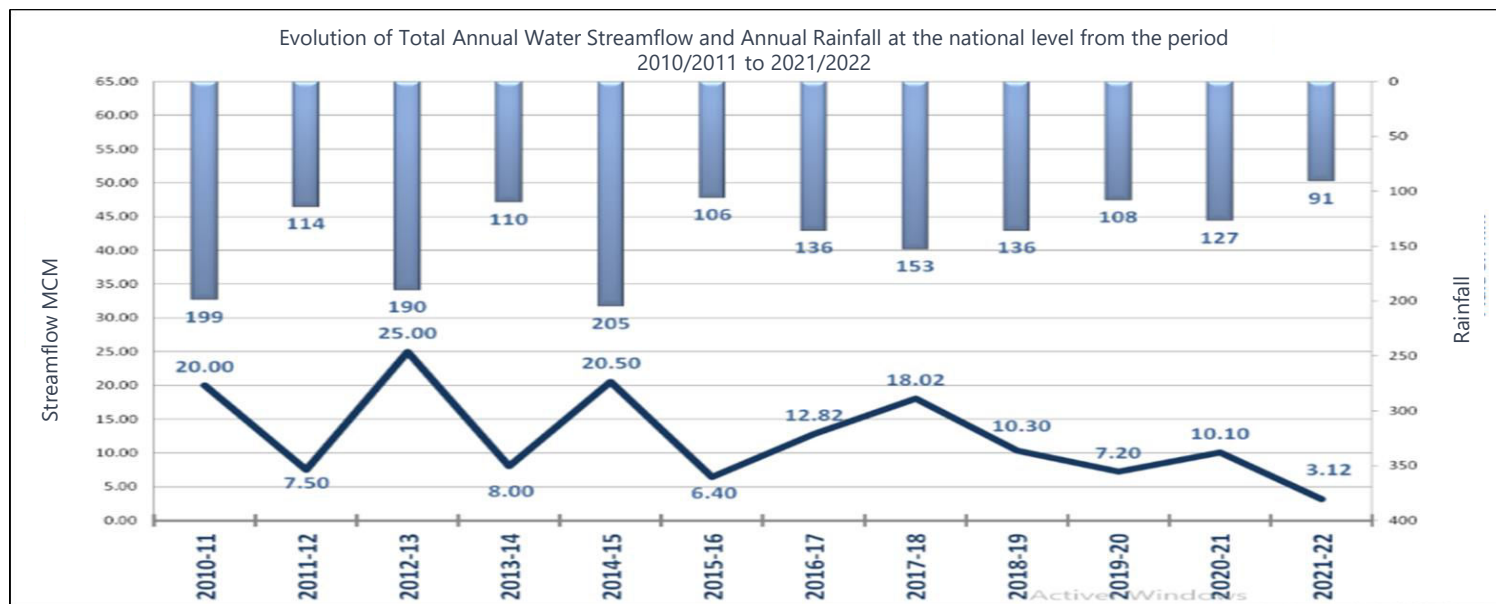
- Soil erosion in upstream watersheds causes sedimentation in reservoirs, progressively reducing storage capacity. The Lkhdar basin demonstrates how environmental degradation upstream directly impacts water infrastructure effectiveness downstream.



National Water Sector Context And Challenges

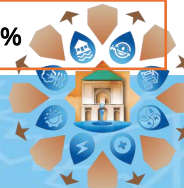
2021-2022 : Driest Hydrological Year Observed Since 1940

- 2021-2022: Characterized by a precipitation deficiency of 47% compared to the national norm.
- Widespread deficits across all hydrological basins ranging from 20% to 54% below normal.
- 2021-2022: Lowest overall water streamflow recorded in a decade at the national level.



Basins	Deficit Compared to the Normal(%)
LOUKKOS	-47%
SEBOU	-47%
BOUREGREG ET LA CHAOUIA	-51%
MOULOUYA	-54%
OUM ER-RBIA	-52%
TENSIFT	-51%
SOUSS-MASSA	-54%
DRÂA-OUED NOUN	-45%
GUIR-ZIZ-RHERIS	-20%
SAKIA EL HAMRA-OUED EDDAHAB	-42%

Amplification of Constraints Due to Climate Change Effects

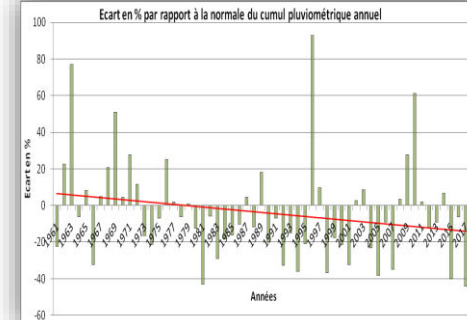
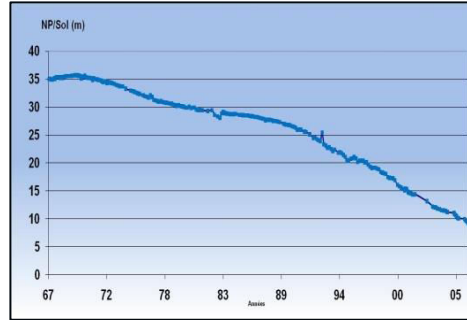


National Water Sector Context And Challenges



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Evolution of Drinking Water Supply: Sources and Development



Groundwater depletion

Rainfall decrease

Natural water Springs

1970

boreholes and wells

1980

Dam construction

2009

Surface Water Development

2015

Non-conventional Development

Before 1970 Natural water Springs and Rivers were the main DWS sources

The irrigation development from groundwater water has impacted the outflow of the natural water springs, hence a shift to the boreholes and wells to reinforce the DWS was required



The combined effect of overexploitation of groundwater resources and the growing water demand made it difficult to ensure DWS, leading to a shift in the paradigm for DWS toward surface water and launching a large dam construction policy.

Due to The impact of the CC on the availability of water resources, it was mandatory to strengthen of the water supply through surface water development and Improvement of water demand management

despite the significant development in terms of surface water, it was necessary to resort to sea water desalination in order to support the socio-economic development of the country, and to reduce the shortage between water demand which continues to increase and the unavailability of surface waters which are already impacted by CC



National Water Climate Change Adaptation Policy



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2009

2020

2027

2050



PNAEP 20-27: NATIONAL PROGRAM ON DRINKING WATER SUPPLY AND IRRIGATION 20-27



Stakeholders in the Water Sector



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Consultative and Coordination Bodies

- Supreme Council for Water and Climate
- Interministerial Water Commission
- Basin Agency Boards of Directors

Public Establishments

- 10 Hydraulic Basin Agencies (ABHs)
- 9 Regional Offices for Agricultural Development
- ONEE - Drinking Water Branch
- ONEE - Electricity Branch
- MASEN (Renewable Energy)

Planning and Sectoral Decision-Making

- Ministry of Equipment and Water
- Ministry of Economy and Finance
- Ministry of Interior
- Ministry of Health
- Ministry of Agriculture
- Ministry of Energy Transition, Sustainability and Environment

Water Users

- Drinking water concessionaires
- Municipal utilities (Régies)
- Water user associations
- Agricultural users
- Industrial users
- Private users



National Program On Drinking Water Supply And Irrigation 2020-2027



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WATER SUPPLY DEVELOPMENT



- Continuing the construction and/or raising of large dams (21 dams)
- Constructing medium and small dams mainly for local development
- Prospecting and improving knowledge of groundwater resources
- Constructing seawater desalination plants to achieve an annual production capacity about 1.5 billion cubic meters by 2030

WATER DEMAND MANAGEMENT AND VALORIZATION



- Saving drinking, industrial and tourist water by :
 - Improving the efficiency of drinking water distribution network ;
 - Increasing the autonomy of drinking water reserves.
- Saving irrigation water by :
 - Collective and individual conversion to drip irrigation ;
 - Modernization and rehabilitation of multi-purpose water supply systems

IMPROVING POTABLE WATER SUPPLY IN RURAL AREAS



- Continuation of programs already underway for the "centers and douars" concerned ;
- Setting up a program for additional "douars" not covered by the programs already underway.

REUSE OF WASTEWATER



- in particular for watering green spaces and golf courses, in order to reach 100 Mm³/year of water Reuse by 2027

ADOPTION OF A COMMUNICATION AND AWARENESS-RAISING STRATEGY



- Institutional communication ;
- Communication for the general public to change behavior.

Given the ambitious scope of the National Water Program (PNAEPI 2020-2027):

💰 145 Billion MAD (**14.5 B\$**) investment required
(PROGRAM COST)

➔ Major infrastructure development across all water uses

➔ Rising operational costs due to energy and technology

What are the financial constraints and how can we address them?



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Water Sector Financing : Major constraints



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Public Budget Dependency

Heavy reliance on state budgets limits investment capacity as water infrastructure needs grow exponentially. Public funds alone cannot meet the estimated 143 billion MAD required for PNAEPI implementation, creating urgent need for alternative financing mechanisms.

Free Water Paradigm

Conventional water from dams provided free or at minimal cost distorts true costs and creates unfavorable comparison for unconventional sources like desalination. This pricing structure undermines financial sustainability and discourages investment in alternative supply options.

Cost Recovery Challenge

Balancing state contributions with user payments remains problematic. Finding equilibrium that ensures financial sustainability while maintaining affordability and social equity requires sophisticated pricing mechanisms and targeted subsidies for vulnerable populations.

Rising Costs

Production and sanitation expenses escalate due to energy costs, technology requirements, and infrastructure complexity. Desalination and advanced treatment demand significant capital and operating expenditures, straining existing funding models.

Weak Fee System Performance

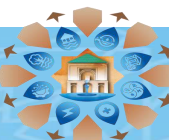
Basin agencies' fee collection underperforms due to limited application of polluter-pays principle and non-incentivizing rates. Low fee levels fail to generate sufficient resources for basin management activities or encourage efficient water use and pollution prevention.



In a Climate Change Context



The Challenge: Mobilize **innovative financial resources** to maintain universal water access and quality while building resilience against climate variability and securing long-term sustainability



Water Sector Financing : Existing and innovative financing mechanisms



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Diversifying financing sources is essential to bridge Morocco's water investment gap. Each mechanism offers distinct advantages while presenting specific implementation challenges requiring careful management.

Mecanisms	Definition	Examples in Morocco	Advantages	Limitations
Traditional Public Financing	Resources from state or public banks supporting water and sanitation projects	Budget subsidies, loans and advances from public banks	Financial security and stability, support for strategic national projects	Limited budget capacity, state dependency
Blended Finance	Combination of public resources, climate financing, and private investment to reduce risks and attract capital	Public-private co-financing for sustainable irrigation, climate fund mobilization	Amplifies public finance impact, encourages private investment	Coordination complexity among stakeholders
Public-Private Partnerships (PPP)	Collaboration between state and private sector to design, finance, and operate water infrastructure	Chtouka-Agadir and Casablanca desalination, North-South water transfer	Private technical expertise, risk sharing, operational efficiency	Complex contracts, requires solid legal framework
Green and Climate Bonds	Financial securities to fund environmentally friendly projects aligned with climate objectives	Alignment with Green Morocco Plan, Green Generation, and NDC 2021; renewable energy and irrigation modernization projects	Access to environmentally conscious investor market, sustainability promotion	Requires transparency and strict impact monitoring



Water Sector Financing : Aligning water investment efforts with climate and development goals



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National Water Plan (PNE 2020–2050)

Strategic framework for prioritizing investments in water supply, sanitation, efficiency, and resilience. The total cost of the plan is over 350 Billion DH in particularly for planned investments for desalination powered by renewable energy, inter-basin transfers, dam rehabilitation, and water storage expansion.



Morocco's Updated NDC (2021)

Positions water security as a key component of climate adaptation, with goals including a 50% reduction in urban water losses by 2030, expanding non-conventional water use, and promoting irrigation efficiency.



Synergy with Development Strategies

The New Development Model (2021) emphasizes universal access to water services and stronger, more accountable public finance mechanisms aligned with regional equity and innovation.



Use of Climate Finance Instruments

Morocco is engaging international climate finance, such as the Green Climate Fund and Adaptation Fund, for projects like desalination and drought resilience. Public-private partnerships are also leveraged especially in Desalination projects (PPP Chtouka Agadir) and Interbasin water Transfer (North to South).



Development–Climate–Water Nexus Approach

Water projects are now assessed for their climate resilience, social inclusion, and development impacts, with new tools and indicators for integrated evaluation (desalination Plant)



Water Sector Financing : Strategic chain



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Governance



Effective governance, characterized by strong interinstitutional coordination and financial transparency, enables superior planning and resource management. This solid institutional structure builds system resilience through clear roles, accountable decision-making, and stakeholder participation ensuring efficient and equitable resource allocation.

Resilience



Identifying resilience as a priority guides strategic investment decisions toward projects strengthening system capacity to absorb climate shocks. This includes public, private, and climate financing targeted at sustainable, adaptive infrastructure and technologies that reduce long-term risks and attract diverse funders.

Investment



Smart investments ensure long-term sustainability by guaranteeing equitable water access, preserving ecosystems, and fostering innovation. This includes efficient water use, pollution prevention, ecosystem restoration, and development of unconventional sources reducing pressure on conventional supplies.

Sustainability



Sustainable practices create economic value while protecting natural resources for future generations. This comprehensive approach delivers environmental, social, and economic benefits, completing the cycle that reinforces governance capacity and system resilience for continued adaptive management.

Governance → Resilience → Investment → Sustainability

This integrated strategic chain demonstrates how institutional strength, adaptive capacity, financial commitment, and long-term vision combine to create water systems capable of meeting Morocco's needs today and tomorrow.

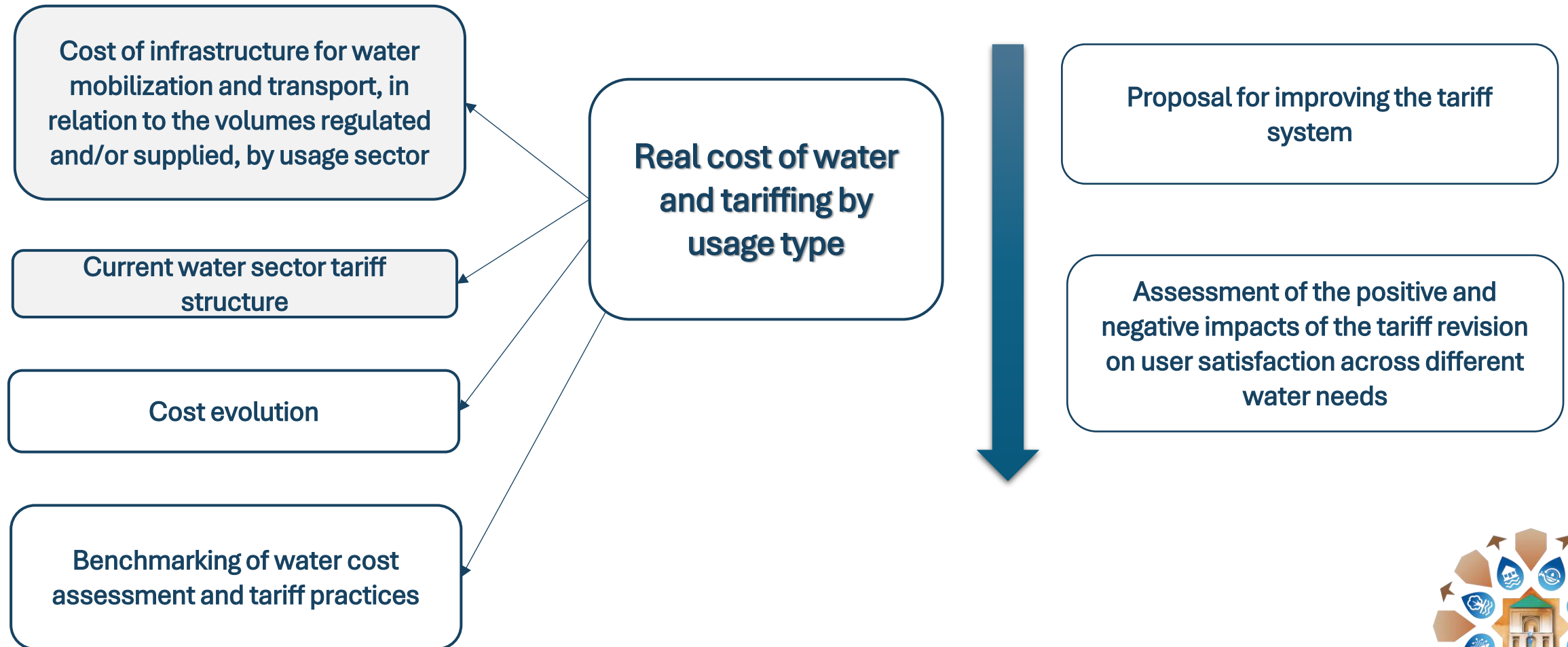


Strategic Study on Water Tariff : Overview



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The Ministry of Equipment and Water commissioned a comprehensive strategic study to examine water costs, tariff structures, and financing mechanisms across all usage sectors. This analysis provides evidence-based recommendations for reforming Morocco's water pricing system to ensure financial sustainability while maintaining social equity and affordability.



Strategic Study on Water Tariff : Main Results



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Full Cost Analysis

The study reveals significant variations in the **average full costs (OPEX + CAPEX)** across different water services:

- **Drinking water:** 3-15 MAD/m³
- **Wastewater:** 0.9-6.3 MAD/m³
- **Large-scale irrigation:** 0.5-3.1 MAD/m³
- **Private irrigation:** up to 5.3 MAD/m³

These cost variations reflect differences in topography, energy requirements, population density, infrastructure age, and service complexity. Understanding these variations is essential for designing appropriate pricing structures.

Critical Finding: Actual tariffs often fall short of real costs, causing structural deficits. Current prices don't reflect water scarcity or real service value, undermining financial sustainability and conservation incentives.

Current Challenges

Tariff heterogeneity exists between operators (ONEE, utilities, concessions), creating inequities and inefficiencies across regions and service areas.

Strong but untargeted cross-subsidies fail to effectively support vulnerable populations while potentially discouraging water conservation behaviors.

Low cost recovery (<80% in some areas) creates structural deficits that undermine service quality and infrastructure maintenance capacity.

Lack of independent economic regulation limits transparency, accountability, and efficiency in tariff setting and service delivery.



Strategic Study on Water Tariff : Key Recommendations



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1. Revise and Harmonize Tariff Structures Across the Sector

- Introduce **cost-reflective tariffs** that better align with the **real cost of water services** (mobilization, treatment, distribution, sanitation).
- Harmonize pricing approaches across service providers (ONEE, Régies, ABHs), while preserving flexibility based on regional specificities.

2. Introduce a Progressive and Equitable Tariff Model

- Design **increasing block tariffs** that:
 - Ensure affordable access to basic needs (first block).
 - Penalize excessive or wasteful use (upper blocks).
- Integrate a **social dimension** to protect low-income households, e.g., through lifeline tariffs or direct support.

3. Implement Economic Signals for Sustainability

- Apply the “**user pays**” and “**polluter pays**” principles.
- Introduce or reinforce fees for groundwater abstraction and pollution discharges, especially in overexploited or vulnerable zones.

4. Enhance Transparency and Public Communication

- Publish clear information on tariff structures, cost breakdowns, and service performance.
- Engage in **awareness campaigns** to improve user understanding and acceptability of new tariffs.

5. Strengthen Data Systems and Monitoring

- Develop a national framework to monitor **costs, revenues, and efficiency** across providers.
- Improve the **granularity and consistency** of financial and operational data to support evidence-based decision-making.

6. Support Reform with Institutional and Regulatory Changes

- Define clear roles between **tariff setting, service delivery, and regulation**.
- Consider the establishment of a **regulatory oversight body** or function to ensure fairness, quality of service, and accountability.



Conclusion

Sustainable Water Financing as Essential Lever

Sustainable water financing constitutes a **critical enabler for climate resilience and economic stability** in Morocco. Without adequate and diversified funding, the country cannot build the infrastructure needed to secure water supplies for its growing population and economy while adapting to intensifying climate variability.

Innovative Mechanisms Bridge Investment Gaps

Innovative mechanisms – including blended finance, green bonds, and public-private partnerships – enable Morocco to **bridge the investment deficit** while ensuring **equitable water access** for all citizens. These tools leverage private capital and international climate finance to complement limited public budgets, expanding investment capacity significantly.

Morocco as Regional Model

With an **integrated and coherent strategy** combining strong governance, strategic investments, and diverse financing sources, Morocco can become a **regional model** for intelligent and sustainable water sector financing solutions. Success will demonstrate how emerging economies can achieve water security amid climate change through innovation, collaboration, and commitment to sustainability principles.



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Thank you!

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