

Under the High Patronage of His Majesty King Mohammed VI



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

Kingdom of Morocco



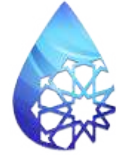
Ministry of
Equipment and Water

Towards an
Artificial Intelligence Approach
in Water Management



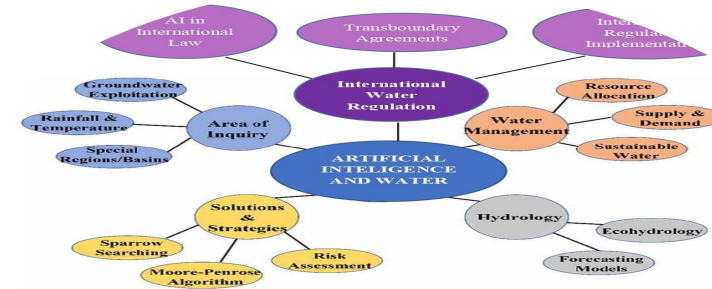
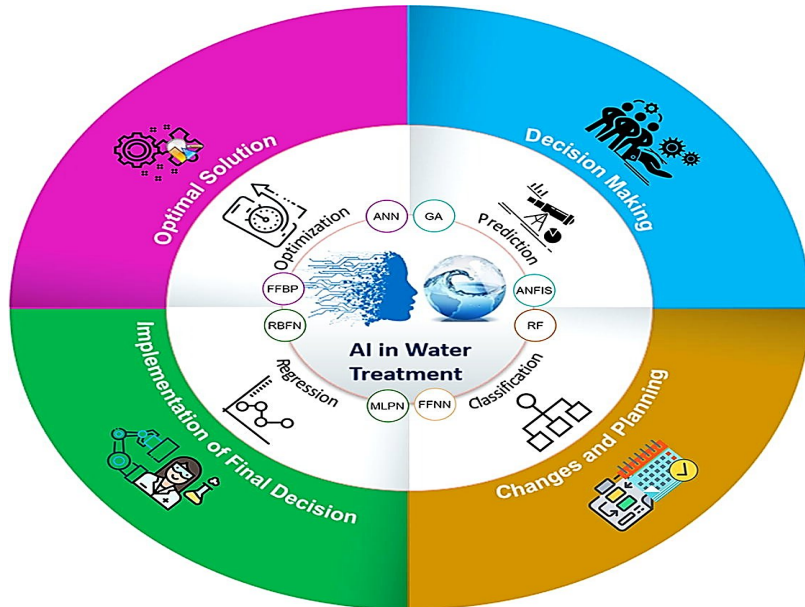
LL.M Mariana Nogales Paez Buzance
Université Paris Nanterre
December 4th, 2025

Summary



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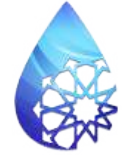
The growing practice of the implementation of Artificial Intelligence (AI) systems in Water Management has been showing that an efficient technology could be an important tool to achieve: water quality, sustainable management, access to water, enhances irrigation,



Therefore, will the successful examples of AI implementation lead to a new **AI-Approach in Water Management**? Will this be effective? Will this strength current national and international water law and governance?



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SITUATION

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CHALLENGES

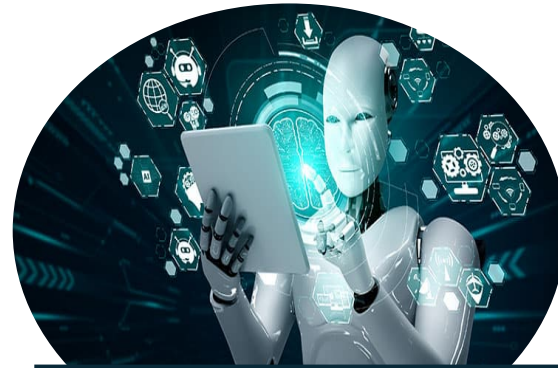
CONCLUSIONS





CLIMATE CHANGE

CURRENT SITUATION



AI TECHNOLOGIES DEVELOPMENT

INEQUALITIES



AI ALREADY USED IN WATER



GOVERNANCE CHALLENGES



Tale of Two Water Disparities
Access and its Impact



AI LEGAL FRAMEWORK DEVELOPMENT



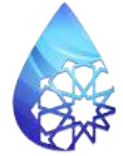
CHALLENGES

AI REGULATION FOR WATER

ethics

environment

Socio-economic Impact



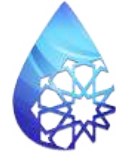
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Kingdom of Morocco
Ministry of
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XIX World Water Congress | Marrakech, Morocco | 1-5 December 2025 | www.worldwatercongress.org

AI REGULATION FOR WATER



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Emerging Global AI Regulations

Global / Multi-National

- CISA, NSA, FBI
- CCCS
- NSCS-UK
- ACSC
- NSCS-NZ
- Joint Report: Deploying AI Systems Securely
- OWASP Top 10 for LLMs
- MITRE ATLAS (Adversarial Threat Landscape for Artificial-Intelligence Systems)
- Vendor AI Security Frameworks (databricks)
- Vendor AI Security Frameworks (cloud)
- AI Management Systems (ISO)
- AI Functional Safety (ISO)
- UN Resolution on AI Systems
- Declaration on the use of AI (G7)

Canada

- AI and Data Act (AIDA)
- Guardrails for AI
- Code of Conduct for GenAI
- Directive on Automated Decision-Making
- Guide on the Use of GenAI

Sweden

- Guidance on GDPR and AI

Germany

- AI Standardization Roadmap

South Korea

- Act on Trustworthy AI
- Digital Bill of Rights
- AI Privacy Task Force

United Kingdom

- AI Data Protection Toolkit
- ICO on GenAI Protection
- AI Regulation Bill

European Union

- AI Liability Directive
- AI Act
- AI Guidelines for Europe
- Draft Framework (AI Human Rights, Democracy, Law)
- Guidelines for Responsible Generative AI Research

Japan

- Gen AI Usage Guidelines
- Cabinet: AI Strategy
- Governance Guidelines
- Social Principles on AI
- AI Business Guidelines

USA Federal

- WH Exec Order 13859
- WH Exec Order 14110
- NIST AI Taxonomy
- NIST AI Risk Mgt. Framework
- White House Blueprint
- FTC Equity in AI Guidance
- National AI Initiative Act
- OMB Guidance on AI Reg.
- AI Ethics Framework
- DoD AI Ethical Principles
- Bipartisan US AI Act
- AI Training Act
- National AI Commission
- AI Risk Mgt. Act
- AI Foundation Model Transparency Act
- Bill for AI Consent Act

USA State

- California, AI Accountability
- Connecticut SB 1103
- Massachusetts SB 31, 2539
- Washington HB 1951
- Indiana SB 150
- Utah SB 149
- Tennessee, Image & Voice Security

France

- Recommendations on Development of AI Systems

UAE

- National AI Program

China

- Depth Synthesis Algorithm Rules
- Service Algorithm Mgt Rules
- Mgt of GenAI Service
- Guidelines for AI in Financial Industry (Draft)

Saudi Arabia

- Guidance on GenAI

India

- Ethical Guidelines for AI Biomedical Research

Brazil

- AI Bill – National DPA

Argentina

- AI Transparency & Privacy Resolution

Singapore

- Guidelines on AI Decision-Making
- AI Governance Framework
- Veritas Initiative
- Model AI Governance Framework

Vietnam

- AI and Big Data Standard

Thailand

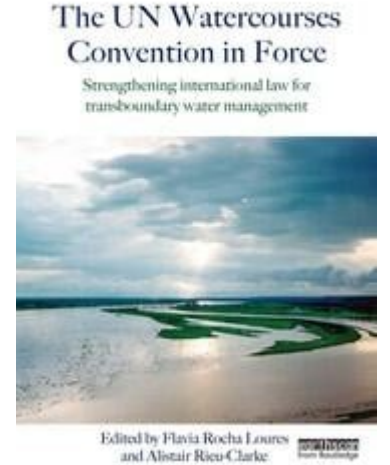
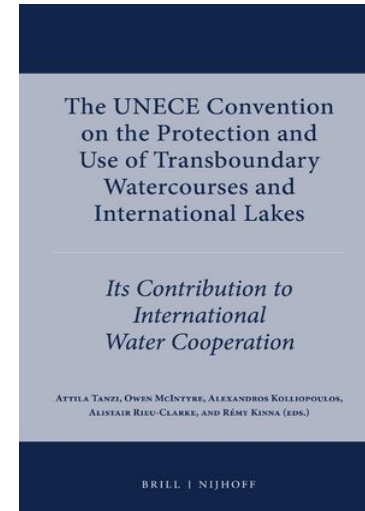
- AI Ethics Guidelines

New Zealand

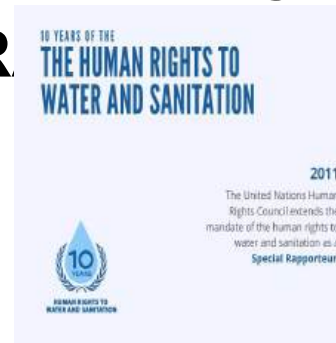
- Algorithm Charter for Aotearoa

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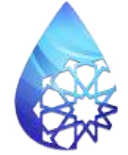
IWL FRAGMENTATION: LIMITED ENFORCEMENT



OTHER LEGAL FRAMES



Ethics – environment – SOCIO-ECONOMIC IMPACT

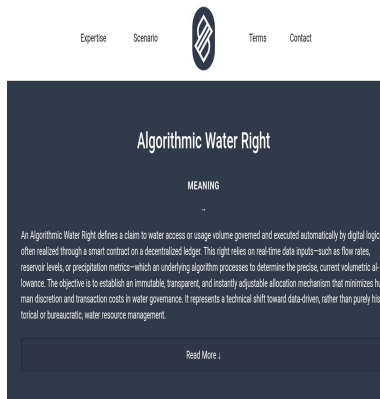
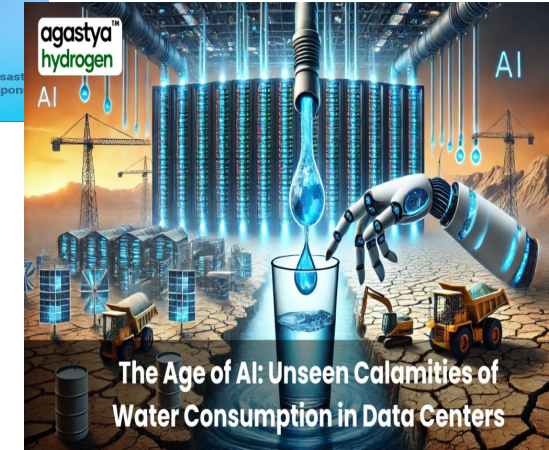
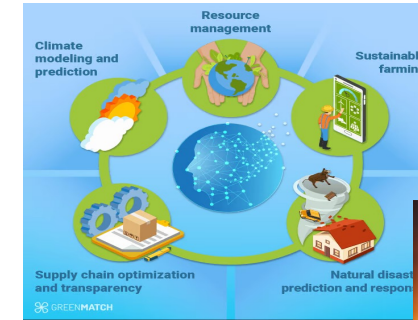
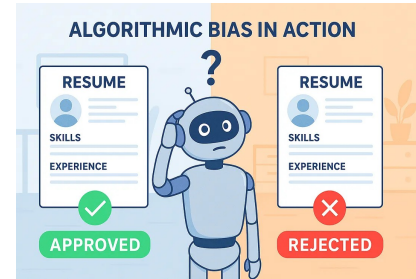


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ETHICS & GOVERNANCE

- Privatization of water data
- Lack of enforceable governance
- Security
- Algorithmic bias to disadvantage certain groups

Hydro-Algorithmic Control, Algorithmic discrimination, Algorithmic water right



SOCIO-ECONOMIC IMPACT

- Potential for job displacement.
- High implementation costs.
- Barriers to its implementation

ENVIRONMENT

- Data centers, cooling systems, and supporting network operations needed for AI consumes large volumes of water demand.
- Its use can impact energy consumption.



AI APPLICATION SCENARIOS

BENEFITS

- Detection of accidental water contamination and Water pollution, overcoming the limitations of traditional methods
- Examination climate risks to dams and downstream damages associated with dam failure.
- Predictive systems enable proactive adaptation to climate change impacts.
- Provides real-time data on water levels, flow rates, water quality, and environmental conditions across entire river basins.

CASE



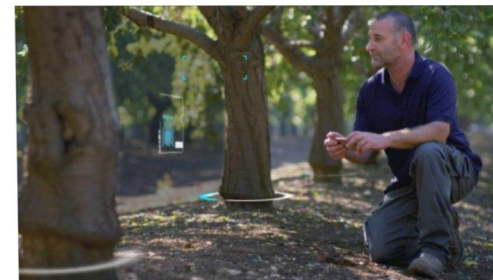
PRA RIVER

ISRAEL'S IRRIGATION SYSTEM

Precision Irrigation

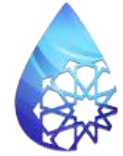
The first irrigation system with a brain

NetBeat- the second revolution in smart (drip) irrigation



4 minutes read

israeli irrigation specialist [netafim](#) recently launched its new precision drip irrigation system [netbeat](#). the company likes to refer to it as the second revolution in smart (drip) irrigation.



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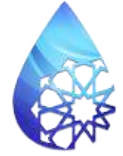
INDIA'S WATER MANAGEMENT

Delhi

DJB, IIT Kanpur to build India's first water management model based on AI

The project will also develop AI-based grievance redressal and revenue management systems to ensure faster complaint resolution, improve billing accuracy, and enhance customer satisfaction.





CONCLUSIONS

The application of AI in water management can :

- Reduce pollution and enhance water quality
- Increase access to water and sustainability
- Strength water policies and water regulation

To overcome implementation challenges an inclusive approach is needed. This should combine technological innovation with robust governance and legal frameworks, capacity building, and a commitment to equitable and sustainable water management.

❖ Promoting an *AI-Water Management-Approach* preventing the failures of the implementation of these technologies in order to build effective water management systems.

Relying on a Hybrid ('AI+human' System) will help to avoid risks that will treat water security when using AI Systems

