International Water Resources Association
IWRA

FINAL REPORT

# 1st IWRA Islands Water Congress Policy Report
# Freshwater Regulation on Islands


**A RESEARCH REPORT BY**

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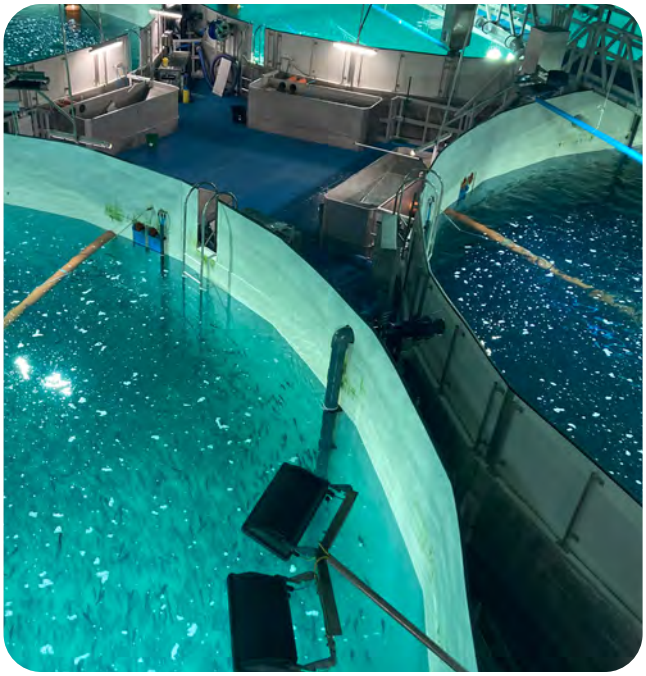

# Authorship and Acknowledgments

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The report also benefited from research assistance provided by Melanie Close and Ya Wen (Charlotte). Ya Wen served as the lead author of Part III of the report.

# Foreword

by **Yuanyuan Li,** President of the International Water Resources Association (IWRA)

The International Water Resources Association (IWRA) and the Faroese Geological Survey (Jarðfeingi) successfully co-hosted the 1st Islands Water Congress from 4–6 September 2024 at the Nordic House in Tórshavn, Faroe Islands.

Bringing together global experts, policymakers, and island representatives from 40 countries under the theme "Freshwater and Islands: Governance, Collaboration and Innovation," the Congress provided a landmark platform for comprehensive discussions on how to address the unique challenges of freshwater management, cross-sectoral cooperation, and innovative governance in island contexts. It marked a significant milestone in advancing dialogue for island communities and states worldwide.

As President of IWRA, I take great pride in the fact that this Congress truly embodied our mission—to bridge science, policy and practice for sustainable water management. Islands lie at the forefront of water vulnerability. Their exposure to climate-induced hazards, fragile ecosystems, and reliance on external inputs vividly reflect the broader water challenges confronting the world today. These realities not only pose significant challenges but also offer opportunities for innovation and cooperation across the global water community.

This Congress has left a meaningful and lasting legacy, including the establishment of the IWRA Islands Water Task Force, the formation of a legal expert group dedicated to freshwater issues on islands, and the drafting of a new Water Act aimed at strengthening water management across the Faroe Islands. This policy

report focuses on a subtheme of the Congress that the host island nation, the Faroe Islands, identified as particularly relevant: regulation. The report draws from governance and regulatory experiences on other islands to suggest two concrete policy recommendations in the field of water regulation for the Faroe Islands, but also relevant for island nations and communities more generally.

***Together, we have laid the foundations for a lasting platform—one where island voices are amplified, and inclusive, evidence-based dialogue contributes meaningfully to shaping global water policy.***

Looking ahead, IWRA reaffirms its commitment to supporting island communities in addressing the interconnected challenges of water, climate, and sustainable development. Together, we can turn vulnerability into resilience, isolation into cooperation, and scarcity into lasting water security for all.

I wish to express my sincere appreciation to the Faroese Geological Survey (Jarðfeingi) for its leadership and warm hospitality, and to all partners, governments, experts, and local stakeholders whose dedication and collaboration made this Congress a success. Together, we have laid the foundations for a lasting platform—one where island voices are amplified, and inclusive, evidence-based dialogue contributes meaningfully to shaping global water policy.

**Yuanyuan Li**

*President,*
*International Water Resources Association (IWRA)*

# Executive summary

**The Faroe Islands have an apparent abundance of freshwater from rainfall and spring water. However, rising freshwater demands, together with limited or lack of data, highlights the need for a deeper understanding of the resource. Against this background, freshwater governance in the Faroe Islands is fragmented across multiple ministries and agencies and there is no single comprehensive law on freshwater. The government has plans to introduce an integrated water law to unify management and align with EU standards. An important facet of freshwater governance in the Faroe Islands is the acknowledgement that sustaining the islands' freshwater future will require better data, coordinated governance, and greater public awareness of water resource challenges.**

This policy report presents two concrete recommendations to the Faroe Islands in the context of their ongoing reform process of freshwater governance.

First, the Faroe Islands will benefit from establishing a Water Forum that brings together freshwater related stakeholders from throughout the archipelago. The objective of the Water Forum is to leverage data on freshwater availability and to continue raising awareness of freshwater resources. The Faroe Islands should also implement a public education and engagement campaigns targeting school children and the broader public on water conservation and management practices.

Second, the Faroe Islands would benefit from developing a new, overarching framework law that encompasses all aspects of freshwater resources management in the archipelago. A new framework law on freshwater should, where possible, address all aspects of freshwater resources management in the archipelago, laying the foundation for the governance mechanisms to be employed. Should such law not be possible, the Faroe Islands could formulate a law that complements existing laws and regulations, lays out guiding principles, and clarifies the roles and responsibilities of relevant institutions in relation to domestic and commercial uses of freshwater through permit systems.

The law proposed for the Faroe Islands is obviously tailored to the Faroe Islands' socio-economic reality. However, some of its key characteristics can be considered by other islands and governments as well as stakeholders therein.

# Introduction

**This report stems from the 1st IWRA Islands Water Congress held in the Faroe Islands from 4 to 6 September 2024. The focus on regulation originated with the host island, the Faroe Islands, which was keen to use the Congress to leverage information from the event towards reforming its own regulations related and applicable to freshwater resources. The report, however, also builds on examples and information from other islands.**

The analysis used in this report follows a five-step methodology developed in close collaboration with the host island nation and participants at the Congress. First, the Congress theme focusing on water regulations was co-organised with a wide range of freshwater related stakeholders in the Faroe Islands[1]. Second, a bespoke policy report technical team was developed within the Congress International Scientific Committee. That technical team developed a questionnaire that was distributed to Congress participants (Annex A). Third, a side event open to a wide range of Faroese freshwater stakeholders was organised during the Congress (Annex B). Fourth, a special session was organised for Con-

[1] In preparation for the 1st Islands Water Congress 2024, Jarðfeingi (Geological Survey of the Faroe Islands) hosted a workshop on water, bringing together representatives from municipalities, industry, and government within the Faroe Islands. The aim was to create a platform for collaboration on water-related issues, from the supply of drinking water to wastewater management and the use of water as an energy source. The workshop also served as a first step toward a larger local water conference planned to be held in the Faroe Islands in two years' time. Discussions highlighted both challenges and opportunities, underscoring the growing importance of secure and sustainable access to clean water—locally and globally.

gress attendees to discuss the questionnaire responses and share additional examples from other participants. Fifth, the technical team met to discuss and formulate sound, concrete policy recommendations for the Faroe Islands based on the questionnaire responses, the local stakeholder event, and the discussion session.

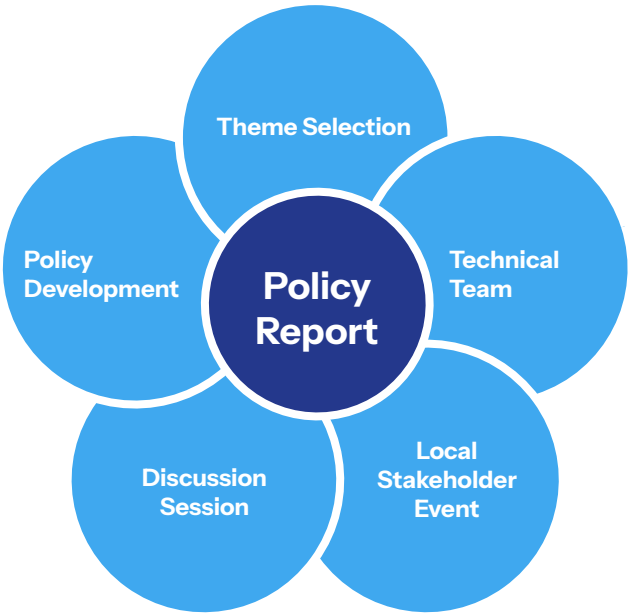



*Figure 1. Diagram with the steps of methodology in the progress creating a policy report.*

The first part of the report provides a landscape of freshwater resources in the Faroe Islands. The second part discusses the legislative and regulatory framework currently in place in the archipelago. Part three of the report shares good legislative and regulatory practices from other islands. The final part of the report provides concrete recommendations to the Faroe Islands in the context of their ongoing process of reforming their freshwater legislation and regulations.

Overall, the 1st IWRA Islands Water Congress Policy Report puts forward the following recommendations, proposing that the Faroe Islands would benefit from:

- an instituationalised programme for data collection and dissemination that expands the availability of information on freshwater resources;
- increasing public awareness about freshwater resources;
- establishing an annual or biennial Water Forum that brings together freshwater related stakeholders from the Faroe Islands to leverage additional data and to raise awareness of freshwater resources; and
- developing a new, overarching framework law that encompasses all aspects of freshwater resources management in the archipelago. Should such law not be possible, the Faroe Islands could formulate a law that complements existing laws and regulations, lays out guiding principles, and clarifies the roles and responsibilities of relevant institutions in relation to domestic and commercial uses of freshwater through permit systems.

01

# Part one: The freshwater landscape in the Faroe Islands

**When exploring freshwater conditions on any island (and non-islands), it can be useful to take a source-to-sea approach (Figure 2). Such a methodology helps to formulate critical questions that can help to better understand locally-specific conditions. Among others, these questions include: Where does the freshwater come from? How is freshwater treated for its intended uses? How is freshwater taken from the source and transported to the users? Who are the main users of available freshwater, and are there competing interests among them? How is freshwater treated and disposed of once it has been used? What authorities are involved in the treatment, extraction, and delivery of freshwater supplies, as well as the treatment and disposal of wastewater?**

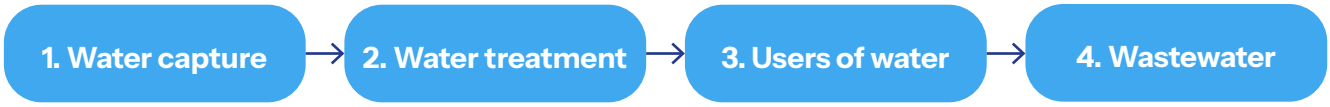
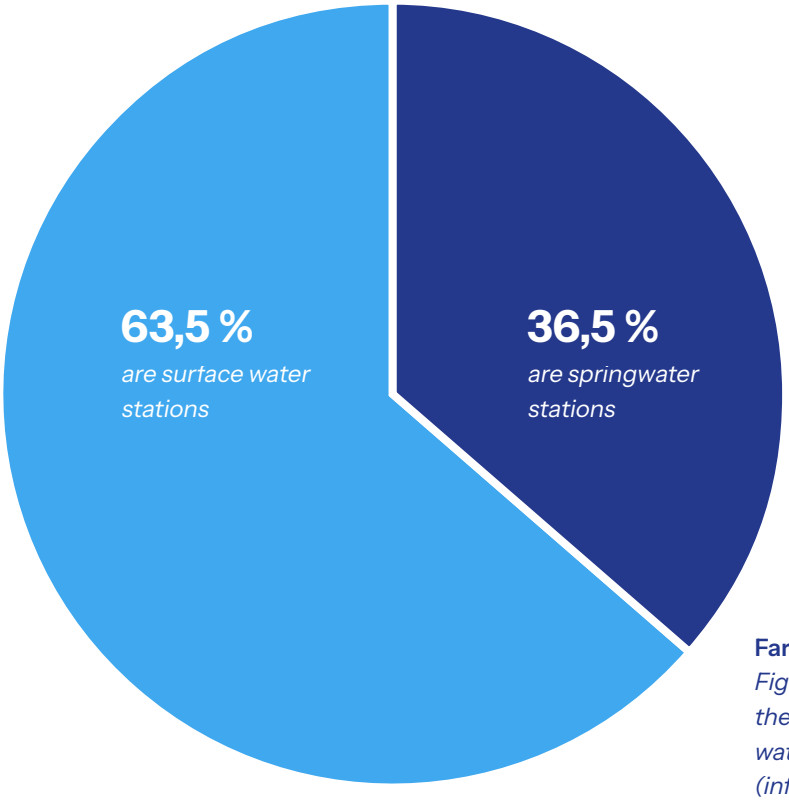



*Figure 2. The figure shows the four elements of freshwater from the source-to-sea approach.*

Applying this to the Faroe Islands, there is a perceived abundance of freshwater. However, temperature and most likely rainfall patterns are increasing[2] in the archipelago due to climatic changes and need to be fully understood and explored. In addition, in recent times shallow geothermal wells (200-400 m deep) have been drilled for heating private homes. In the process of drilling geothermal wells, an increasing knowledge of groundwater has been gained, through measurements taken from the wells. This growing understanding, along with the confirmed presence of substantial groundwater in the Faroe Islands, has led to a rising demand for the groundwater resources.

Currently, the main source of freshwater in the Faroe Islands is rainfall, which is captured and used through surface reservoirs. However, spring water from aquifers is also a common freshwater source and is also captured in the same surface reservoirs. However, because it is now becoming more common to drill for groundwater in the Faroe Islands, more data and greater understanding of the subsurface is required to ensure that this resource is used sustainably into the future.

The Faroe Islands has 115 water supply stations, with approximately one-third from spring water and two-thirds from surface water sources[3]. However, data about the amount of water flowing from these different sources is not available. All the freshwater captured in the Faroe Islands travels from reservoirs to pipelines and is then treated with sand- and/or UV filters. It is used to meet the water demands of homes, schools, smolt production, fish factories, and other industries.

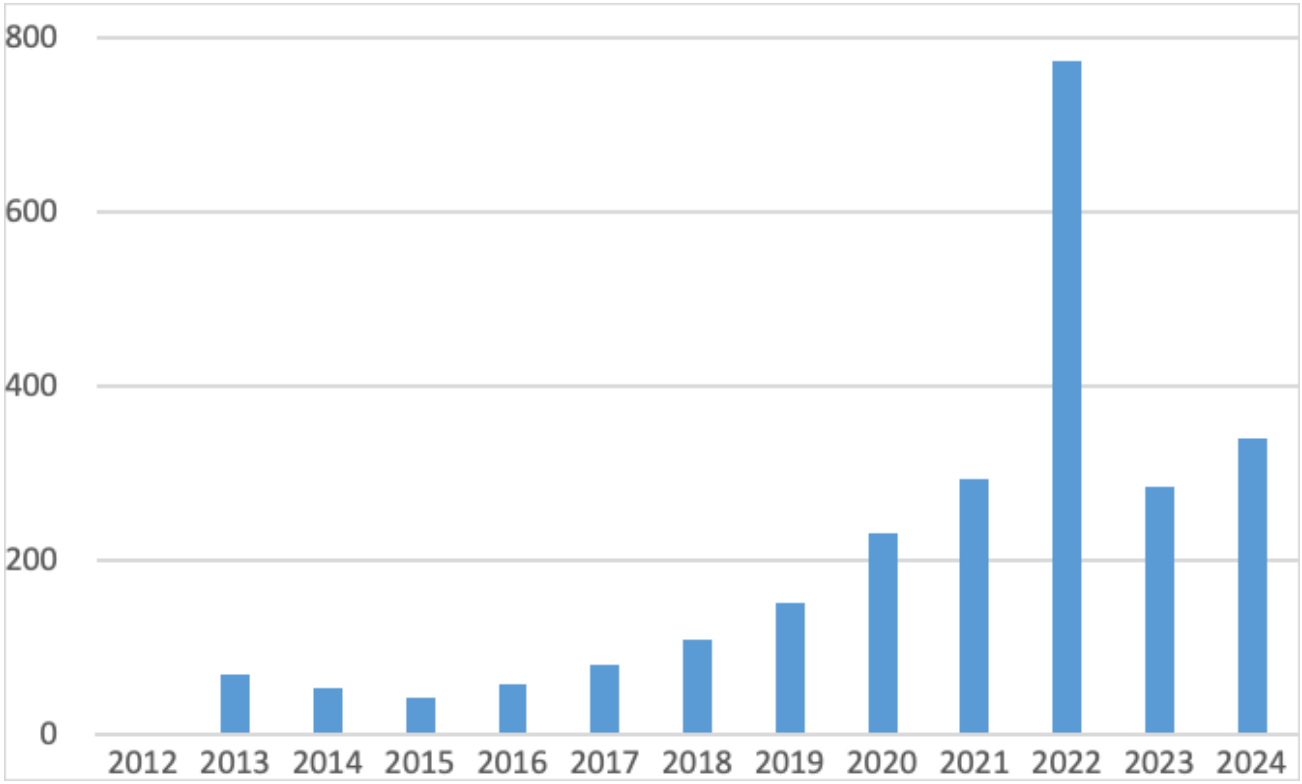



**Faroese Food and Veterinary Authority**
*Figure 3. There are 115 water supply stations in the Faroe Islands, whereof one-third from spring water and two-thirds from surface water sources (info: Faroese Food and Veterinary Authority).*

[2] https://climateknowledgeportal.worldbank.org/country/faroe-islands/climate-data-historical
[3] Info: Faroese Food (Figure 3)

Over the past ten years more than 2,000 shallow geothermal wells have been drilled in the Faroe Islands for heating buildings (Figure 4). Measurements from more than 1,000 of them provide a valuable understanding of groundwater in the Faroe Islands. For example, 30 per cent of geothermal wells are artesian, and 10 per cent of these wells have an artesian flow greater than 1 $m^3$ per hour and occasionally reach up to 1 $m^3$ per hour . Most of these artesian wells are located less than 15 metres above sea level. Currently, the water from these geothermal wells is not used in the drinking water supply because the existing infrastructure relies on collecting water at a specific elevation, with sources situated even higher in the landscape. To utilise geothermal water, it would need to be pumped up to the reservoirs, which is a costly process.

*Figure 4. Total applications per year for shallow geothermal wells between 2013 and 2024.*




Freshwater is also relevant for many sectors of the Faroese society and economy. It is obviously vital for drinking purposes of the entire population in the Faroe Islands, but is also crucial for two key economic sectors—smolt production and fish processing (Figure 4).

| Indicator | Farmed Atlantic Salmon | Chicken | Pork | Beef | Lamb |
|---|---|---|---|---|---|
| $CO_2$ emissions per kg of product (kg $CO_2$e) | Lowest: 3.24 | 3.52 | 3.44 | 23.92 | 21.00 |
| Land use ($m^2$ per 100 g protein) | Lowest: 3.7 | 7.1 | 11 | 102 | 185 |
| Feed conversion ratio (kg feed / kg weight gain) | Best: 1.2–1.5 | 1.7-2.0 | 2.7-5.0 | 6-10 | No data |
| Water use (litres per kg of food) | Lowest: 2,000 | 4,200 | 6,00 | 15,00 | No data |
| Edible yield (% of meat per kg of feed) | Highest: 68% | 46% | 52% | No data | 38% |

*Figure 5. Farmed Salmon Is the Most Efficient User of Animal Protein (source: WWF Sweden, CarbonCloud, GSI. [4]).*

The average annual export of salmon between 2019 and 2023 was 70,000 tonnes[5], corresponding to 140,000,000 tonnes of water usage per year or approximately 4,500 litres per second.

Freshwater has also played a role in the renewable energy sector sphere with surface flows fuelling hydropower production and circulating groundwater supporting geothermal energy production. The possibility of green hydrogen production is also being explored. In addition, freshwater is important in the leisure and tourism sector of the Faroe Islands.

Because of the perceived abundance of freshwater resources, until recently there have been few instances of competition among users. However, the prospects of increased freshwater demand and consumption by across sectors in the Faroe Islands make it important to acquire information and data on rainfall patterns, size of manmade and groundwater reservoirs, recharge rates and refill time, among other factors.

Lastly, even though Faroese law requires that by the end of 2014 all water be appropriately treated and disposed of after use, most municipality have not yet fully implemented water treatment and disposal operations. Unfortunately, wastewater treatment plants and pipelines have not been prioritized by government leaders or the communities. At present, most of the wastewater is discharged untreated into the fjords.

Overall, the picture of freshwater in the Faroe Islands is one of apparent blissful abundance, of slow but steady (climate) change, and of (current) lack of competition between different users. Against this picture, however, there is an urgent need to: 1) better understand the changing patterns of freshwater availability, 2) generate more data regarding freshwater resources, and 3) raise awareness of freshwater supplies and uses amongst the population of the islands, particularly in schools and among younger generations.

[4] Salmon Farming Industry Handbook 2019
[5] Heim | Hagstova Føroya

02

# Part two: Current legislative and regulatory and institutional framework applicable to freshwater in the Faroe Islands

**The Faroe Islands have a fragmented and sometimes outdated set of laws and regulations that are either applicable to directly to freshwater or relevant to its management. There is no one law that governs all aspects of freshwater management in the Faroe Islands, nor is there one government institution or body that is responsible for all aspects of freshwater resources. A law focused on groundwater was recently adopted, further adding to the complexity of the legislative and regulatory framework applicable to freshwater.**

Overall, there are different laws and institutions covering surface water, groundwater, wastewater, and geothermal and hydropower energy. Some of these laws fall under in the Ministry of Foreign Affairs, Industry and Trade, whilst others under the authority of the Ministry of the Environment. In the former, the two authorities responsible for the laws and regulations are the Faroese Food and Veterinary Authority and the Faroese Geological Survey. In the latter, the authority responsible is the Faroese Environment Agency (Annex C: Table 1).

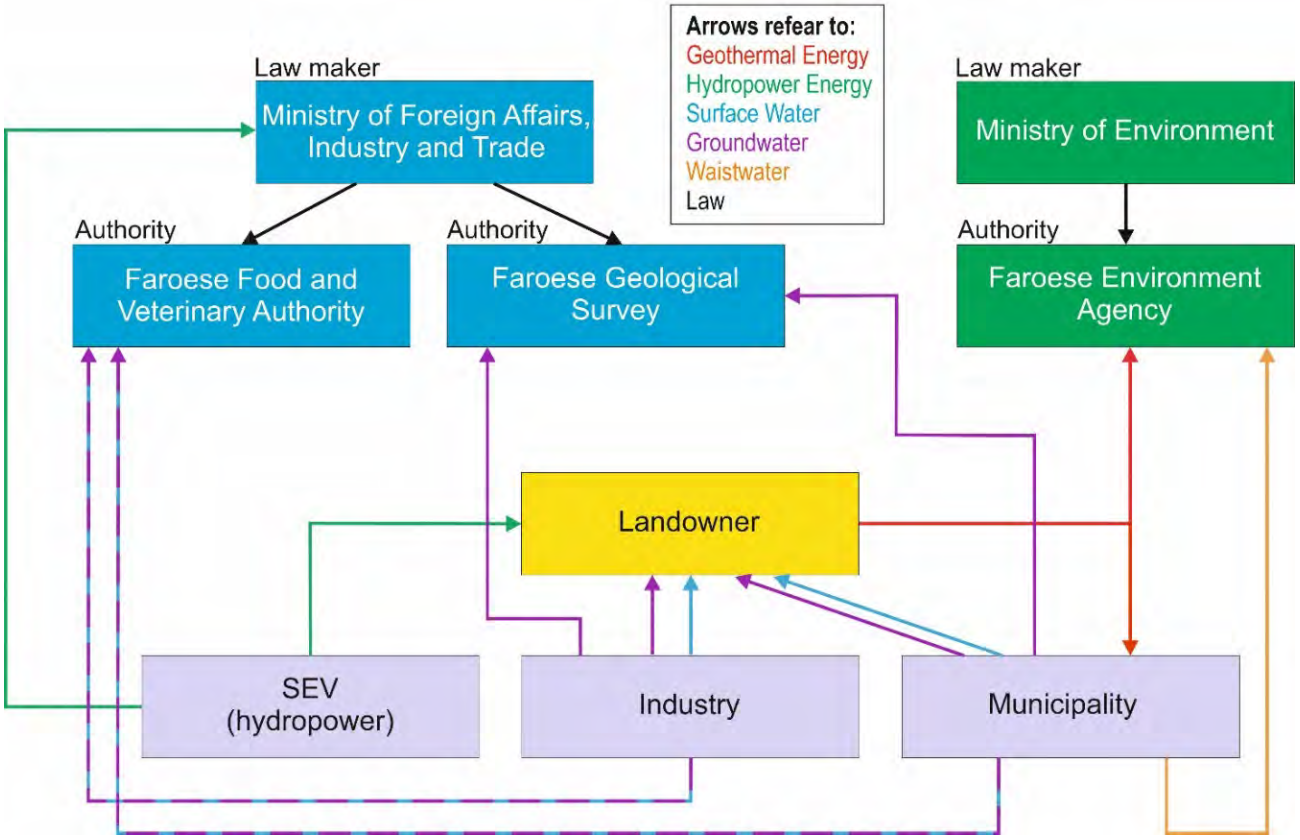



*Figure 6. Diagram clarifying command lines regarding regulations of freshwater in the Faroe Islands.*

The Government recently decided to create a comprehensive water law that incorporates all freshwater issues in the Faroe Islands. . In doing so, it will be important to retain some of the more recent laws and regulations developed to ensure compliance with EU regulations.

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# Part three: Good legislative and regulatory practices from other islands

**This part of the report will move away from the Faroe Islands and present examples of practices from other islands around the world relating to three specific topics:**

1. **Groundwater and lack of data**
2. **Hydropower governance**
3. **Freshwater governance and regulation**

We are aware that many of the practices identified in this report as good practices may be considered as such because of specific local circumstances. However, we also consider that there is value in sharing good practices to allow stakeholders in other islands to consider how they relate (if at all) to their reality and, if so, how to adjust such good practice to their own socio-economic, hydrological, and geographical conditions.

## THEME 1: GROUNDWATER AND LACK OF DATA

### Case Study 1: Iceland's Integrated Groundwater and Geothermal Resource Management [6]

**SUMMARY:** Iceland has developed a comprehensive water resource management system that addresses the unique challenges of managing interconnected groundwater and geothermal systems in a volcanic island setting. The country relies heavily on groundwater. The National Energy Authority has established enhanced groundwater governance through robust licensing and monitoring systems, grounded in legal frameworks including Iceland's Water Act and Natural Resources Act, and the EU Water Framework Directive. The system features streamlined application processes, rigorous on-site audits, and adaptive feedback mechanisms where findings continuously inform licensing criteria. This governance approach is critical given Iceland's complex hydrogeological context, where industrial use dominates, including fisheries, aquaculture, food processing, heavy industries, and geothermal applications for district heating. The system addresses specific technical challenges such as saline water intrusion in coastal geothermal systems, demonstrated by research at the Hjalteyri geothermal field, where over-extraction beyond natural recharge rates (130-170 litres per second) led to seawater incursion, increased chloride concentrations, and operational risks including reservoir cooling and corrosion. Iceland's approach combines minimal water treatment with sophisticated resource monitoring, thereby ensuring sustainable management of resources that support both domestic needs (30-40 per cent of use) and major industrial sectors essential to the island's economy.

#### WHY THIS IS A GOOD PRACTICE?

- It leverages natural advantages while addressing technical complexity: Iceland's system maximises the benefits of naturally high-quality water resources while using advanced governance and monitoring to manage the technical challenges of interconnected groundwater-geothermal systems unique to volcanic islands.
- It balances major industrial demands with resource sustainability: The framework successfully manages competing demands from large industrial users while maintaining resource integrity through adaptive licensing that responds to scientific monitoring of extraction impacts and natural recharge limitations.
- It integrates governance, science, and operational reality: The system demonstrates how regulatory frameworks can be informed by detailed hydrogeological research and real-world operational experience, creating management decisions that respect both economic needs and the physical constraints of island water systems prone to saline intrusion when over-exploited.

[6] This good practice stems from the presentation at the Congress of Tinna Jónsdóttir, Finnbogi Óskarsson, Sigrún Tómasdóttir, and Heimir Ingimarsson.

### Case Study 2: The Maldives – Conservative Management in Data-Scarce Environments[7]

**SUMMARY:** The Maldives represents a paradigmatic case of pragmatic water governance for very small atoll islands where freshwater occurs only as thin freshwater lenses suspended over saline water. The islands face extreme challenges in accurately monitoring these dynamic systems, with lens thickness often less than 4-5 meters and highly seasonal variability. Water balance calculations require numerous assumptions about lateral flow loss to the ocean and recharge rates, particularly where cemented upper layers reduce hydraulic conductivity, forcing reliance on simplified methods such as the Ghyben-Herzberg lens model. Rather than waiting for perfect data, the Maldives operates on conservative management principles: encouraging Managed Aquifer Recharge through sustainable drainage systems, adhering to the core principle of "recharge more volume of fresh water than the volume that is extracted," and mandating detailed studies only for large-scale withdrawals. The water supply system demonstrates this diversity: Mulah Island uses desalinated deep groundwater, shallow groundwater from wells and pumps, and harvested rainwater, with processing ranging from ultra-filtration and reverse osmosis to no treatment for rainwater. The technical approach is supported by innovative community engagement through low-cost, automatically reporting monitoring stations, game-like educational tools that allow students to manipulate land use patterns to observe freshwater lens changes, and workshops with school Environmental Clubs across the 188 inhabited islands. This bottom-up approach recognises that while comprehensive monitoring using multi-depth well sets is possible, the associated costs limit such systems to research applications rather than operational deployment.

#### WHY THIS IS A GOOD PRACTICE?

- It embraces realistic constraints while maintaining safety: The approach accepts the inherent limitations of data collection in small atoll environments while implementing conservative principles that prioritize long-term resource sustainability over short-term optimization, providing a practical blueprint for resource-constrained islands.
- It combines technical pragmatism with community engagement: The system demonstrates how simplified technical approaches can be coupled with innovative public education and monitoring systems that make complex groundwater concepts accessible to island communities, fostering local stewardship and understanding.
- It provides scalable solutions for atoll contexts: The conservative management framework offers a replicable model for other small island states facing similar hydrogeological constraints, showing how to balance the need for freshwater access with the reality of limited technical and financial resources for comprehensive monitoring systems.

[7] This good practice stems from the presentation at the Congress of Assela Pathirana and Chirag Bhimani.

### Case Study 3: Prince Edward Island, Canada – Citizen Science and Innovative Data Solutions for Coastal Groundwater Management[8]

**SUMMARY:** Prince Edward Island (PEI) presents an innovative approach to managing groundwater resources in the face of dual threats from groundwater depletion and saltwater intrusion driven by coastal erosion, while simultaneously addressing significant data limitations. The island's strategy tackles data gaps through multiple complementary approaches. First, it leverages "citizen science" by engaging a large number of residents with private wells to create a dense, low-cost monitoring network. This effort is supported by carefully designed outreach materials that "make the invisible visible" and help the public understand groundwater vulnerability. Second, the approach integrates historical data analysis through innovative research at the University of Prince Edward Island's GeoREACH Lab, which uses the 1963 Raymond land use map combined with modern aerial photography and provincial databases to assess 60-year trends in land use impacts on water resources. Third, advanced scientific research uses geophysical surveys to map freshwater lenses and provide evidence that coastal erosion directly drives saltwater intrusion. PEI faces unique challenges including competing groundwater quality demands (fresh vs. salt from aquaculture wells) and regulatory gaps where current Water Act measures are inadequate - there are no limits on irrigation water use, and the framework lacks multiparty standing committees for collaboration. The governance structure operates primarily under provincial authority but struggles with enforcement challenges where "public sectors do not want to make people upset" given the island's tight social networks, highlighting how community relationships can complicate regulatory enforcement.

#### WHY THIS IS A GOOD PRACTICE?

- It democratises data collection while building scientific understanding: The citizen science model creates cost-effective monitoring density while fostering public ownership, complemented by rigorous academic research that provides both historical context and cutting-edge geophysical analysis of coastal saltwater intrusion processes.
- It transforms data limitations into innovative methodologies: Rather than being constrained by data gaps, PEI has developed creative approaches using historical cartographic materials, indirect indicators, and community engagement to create a comprehensive understanding of long-term water resource trends and current challenges.
- It provides realistic insights into island governance challenges: PEI's honest assessment of enforcement difficulties in tight-knit island communities, combined with its forward-looking recommendations for water governance boards and stakeholder collaboration, offers valuable lessons for other islands balancing regulatory needs with social cohesion.

[8] This good practice stems from the presentation at the Congress of Barret Kurylyk, Joshua MacFayden, and Daria Kass.

### Case Study 4: Fiji – Institutional Reform and Strengthened Groundwater Administration[9]

**SUMMARY:** Fiji represents a compelling case of institutional reform in action, transitioning from weak groundwater governance to strengthened administration through the development of the National Groundwater Resources Development and Management Policy (2023). Previously, Fiji faced significant institutional weaknesses, including the absence of groundwater legislation, no allocation system, no control on borehole drilling activities, and a lack of transparency in abstraction by the private sector. The reform process has expanded the Mineral Resources Department's mandate to include groundwater allocation to users and control over location and abstraction through a permit system. Key improvements include the installation of mandatory monitoring wells next to major bottling sites, municipal water supplies, and waste disposal sites, with bottling companies required to submit data to the regulator. The reform provides a framework for new legislation through the proposed Groundwater Resources Act, addressing previous regulatory gaps and establishing clear institutional responsibility for groundwater management in a context where commercial water bottling had operated with minimal oversight.

#### WHY THIS IS A GOOD PRACTICE?

- It demonstrates institutional learning and reform: Fiji's transition from weak to strengthened groundwater governance provides a roadmap for other islands seeking to reform their water management institutions, showing that significant institutional change is possible.
- It addresses commercial-community tensions: The reform specifically tackles the challenges of regulating commercial water extraction (including international bottling companies) while protecting community water rights, offering lessons for islands facing similar tensions.
- It's proactive and forward-looking: Rather than waiting for water crises to drive change, Fiji has undertaken comprehensive institutional reform to prevent future problems, demonstrating the value of anticipatory governance in water management.

[9] This good practice stems from the presentation at the Congress of Milika Naqasima Sobey.

## THEME 2: HYDROPOWER GOVERNANCE

### Case Study 1: Jamaica – The Unified Authority Model and its Realities[10]

**SUMMARY:** Jamaica provides a clear example of a unified hydropower governance model. All water use, including for hydropower, is regulated under a single body, the Water Resources Authority (WRA), as mandated by the Water Resources Act. Hydropower is formally classified as a "non-consumptive usage," and the WRA maintains a comprehensive, centralised record of all water abstraction licenses for all sectors. This integrated system is reported to be "working fairly well" and provides clear institutional responsibility, avoiding the governance fragmentation seen elsewhere. However, Geoffrey Marshall is frank about the model's limitations in practice. The WRA faces significant challenges with enforcement due to "low punitive fines" and "limited enforcement power." Furthermore, its operational effectiveness is "directly linked to its financial support from the government," making it vulnerable to political and budgetary pressures.

#### WHY THIS IS A GOOD PRACTICE?

- It provides structural clarity: The unified model is a best practice in terms of institutional design. It enables holistic, basin-wide management and ensures that the water demands of the energy sector are balanced against other needs, which is critical as new demands such as green hydrogen emerge.
- It offers an invaluable lesson in implementation: The Jamaican case is a powerful cautionary tale. It proves that a well-designed structure on paper is not enough. For a unified authority to be successful, it must be given genuine teeth through strong legal enforcement powers and protected from political volatility through a stable, independent funding mechanism.

[10] This good practice stems from the presentation at the Congress of Geoffrey Marshall.

### Case Study 2: Fiji – The Evolving State-Led and Market-Oriented Model[11]

**SUMMARY:** Hydropower governance in Fiji operates under the Electricity Act 2017. The primary institutions are the state-owned utility, Energy Fiji Limited, which develops and operates major projects, and the Fijian Competition and Consumer Commission, which regulates tariffs and licensing. While historically state-driven, the governance framework is adapting to encourage private investment through Independent Power Producers. The National Energy Policy explicitly calls for clarifying "transparent competitive procurement processes and licensing parameters for Independent Power Producers." A critical component of this governance model is the mandatory Environmental Impact Assessment (EIA) process, which is required for new projects and leads to a formal Environmental Approval plan outlining all mitigation measures.

#### WHY THIS IS A GOOD PRACTICE?

- It provides a clear, evolving framework: Such framework enables Fiji to attract private capital while maintaining regulatory control.
- It provides an example of the power of EIAs: The mandatory EIA process ensures that environmental and social impacts are formally assessed and managed before projects proceed.
- It creates a balanced and transparent governance structure: The balance is secured through a combination of a state-led strategic vision, an independent regulator, a pathway for private investment, and required environmental oversight.

[11] This good practice stems from the presentation at the Congress of Atishma Lal.

## THEME 3: FRESHWATER GOVERNANCE AND REGULATION

### Case Study 1: Hawai'i, USA – Governance Rooted in Indigenous Knowledge[12]

**SUMMARY:** Hawai'i offers a profound example of "soft innovation" where governance is built upon a deep cultural and legal foundation. The model evolves from ancestral principles where kānāwai (laws) were based on sharing water equally, to the 1840 Constitution of the Hawaiian Kingdom, which codified these values by defining resources as public and the monarch as a trustee. This lineage directly informs the modern Public Trust Doctrine, which is enshrined in the state's current constitution and affirms that water is a shared public resource to be protected for the people. Elkington's presentation highlights key principles like "collective investment in freshwater," "community empowerment," and using "law as a tool to protect indigenous values." The "Hawaiian Ancestral Circular Economy" model further illustrates this by emphasising "environmental kinship" and regenerative resource redistribution. This isn't just theory; it has served as the legal basis for landmark decisions restoring stream flows diverted for over a century.

#### WHY THIS IS A GOOD PRACTICE?

- It provides a powerful ethical and legal compass: By embedding the principles of public trust and ecological kinship into constitutional law, it creates a durable, non-negotiable framework that guides all subsequent regulation and prevents the resource from being treated as a mere commodity.
- It empowers communities: The doctrine gives legal weight to traditional and customary rights, providing communities with a powerful tool to challenge historical injustices and advocate for the restoration of their ecosystems and cultural practices.
- It is culturally resonant and therefore resilient: Because the legal framework is an expression of deep-seated cultural values, it has a high degree of social legitimacy and is more likely to endure through political changes.

[12] This good practice stems from the presentation at the Congress of Dr. Kamanamaikalani Beamer & Kawena Elkington.

### Case Study 2: Malta – Coordinated Multi-Level Governance[13]

**SUMMARY:** Malta demonstrates how to make a complex, multi-agency system effective. Despite having at least 18 government entities involved in water management, Malta avoids paralysis through formal, institutionalised coordination bodies. The Inter-Ministerial Committee on Water brings together representatives from all relevant ministries to coordinate the implementation of the national water plan, and ensure high-level alignment. Complementing this is the National Stakeholder Water Table, a platform that gathers both public and private sector stakeholders to discuss and provide input on water policy. These dedicated bodies are critical for harmonizing the actions of different agencies, resolving jurisdictional conflicts, and ensuring that water management is approached holistically. This has enabled Malta to implement integrated solutions, such as managing energy-intensive desalination and developing a vital wastewater reuse programme for agriculture.

#### WHY THIS IS A GOOD PRACTICE?

- It proves coordination can overcome fragmentation: Malta's model shows that a complex, multi-agency system can be effective if there are formal, institutionalised mechanisms for collaboration.
- It offers a holistic "learning curve" approach: Malta's success is built on acknowledging past mistakes (like initial high leakage rates) and taking corrective action, offering a realistic path for other islands.
- It integrates technology and policy: The model shows that technological solutions such as desalination are most effective when embedded within a comprehensive governance framework that includes economic instruments (such as tariffs) and stakeholder engagement.

[13] This good practice stems from the presentation at the Congress of Manuel Sapiano.

### Case Study 3: Nosy Mitsio, Madagascar – Effective Governance Without a State[14]

**SUMMARY:** The island of Nosy Mitsio is a remarkable example of effective water governance emerging entirely from the bottom up, in the complete absence of a formal state regulatory framework. In two communities, Community Water Management Committees (CMCs) have been established to administer their gravity-fed pipeline systems. These CMCs are fully autonomous. They "carry out operation and maintenance, collect tariffs, and establish rules and policies for water use." The rules are highly specific and tailored to local conditions, including the designation of water sources for particular uses (such as drinking or agriculture), limits on household withdrawals during the dry season, and the amount to be paid. Edoardo Bono emphasises that the key to success is fostering a deep "sense of ownership at all levels," which is achieved by including every community member from the very beginning of the design and construction process. This bottom-up approach is presented as the "only fair and representative methodology" for management where data and formal institutions are absent.

#### WHY THIS IS A GOOD PRACTICE?

- It is a model of true community ownership: This is not just consultation; it's full delegation of management authority to the local level. This ensures the system is tailored to local needs and creates strong incentives for proper maintenance.
- It demonstrates financial sustainability at a micro-level: The CMCs design and collect their own tariffs to cover operational expenses and spare parts, creating a closed-loop, self-sustaining financial model that is not dependent on external subsidies.
- It is highly adaptable and resilient: Because the rules are made and enforced by the community, they can be quickly adjusted to changing conditions, such as a drought, without going through a complex bureaucratic process.

[14] This good practice stems from the presentation at the Congress of Edoardo Bono.

### Case Study 4: Martinique – Comprehensive Water Resource Modeling[15]

**SUMMARY:** Martinique has developed an innovative integrated water resource management model, the "Model for the Gestion of Resources" (MGR) that addresses the complex challenge of optimising water use across multiple sectors while maintaining environmental sustainability. The MGR emerged in response to high water prices and significant water poverty (affecting 27 per cent of users), as mandated by the official water management master plan. This comprehensive model integrates hydraulic, economic, and environmental considerations to develop decision support scenarios that optimise water resource use for drinking water, agriculture, and industry while respecting minimum biological flows in rivers. The system measures economic impacts, assesses required investment levels for infrastructure maintenance, improves resilience against major events (such as cyclones, earthquakes, and landslides), adapts to climate change and socio-economic developments, and provides perspectives on tariff standardisation. The model's strength lies in its holistic approach, which recognises water management as an interconnected system that requires coordinated strategies rather than isolated interventions.

#### WHY THIS IS A GOOD PRACTICE?

- It is truly integrated: The MGR demonstrates how to balance competing water demands across sectors while maintaining ecological integrity, providing a replicable framework for other islands facing similar multi-use conflicts.
- It is economically grounded: By incorporating detailed economic analysis and tariff considerations, the model ensures that water management decisions are financially sustainable and equitable for communities.
- It is climate-resilient: The explicit integration of climate change adaptation and disaster resilience planning makes this a forward-looking model that prepares for future uncertainties while addressing current challenges.

[15] This good practice stems from the presentation at the Congress of Gaëlle Hielard.

### Case Study 5: Caribbean Water Utilities Insurance Company (CWUIC) – Parametric Insurance for Water Infrastructure[16]

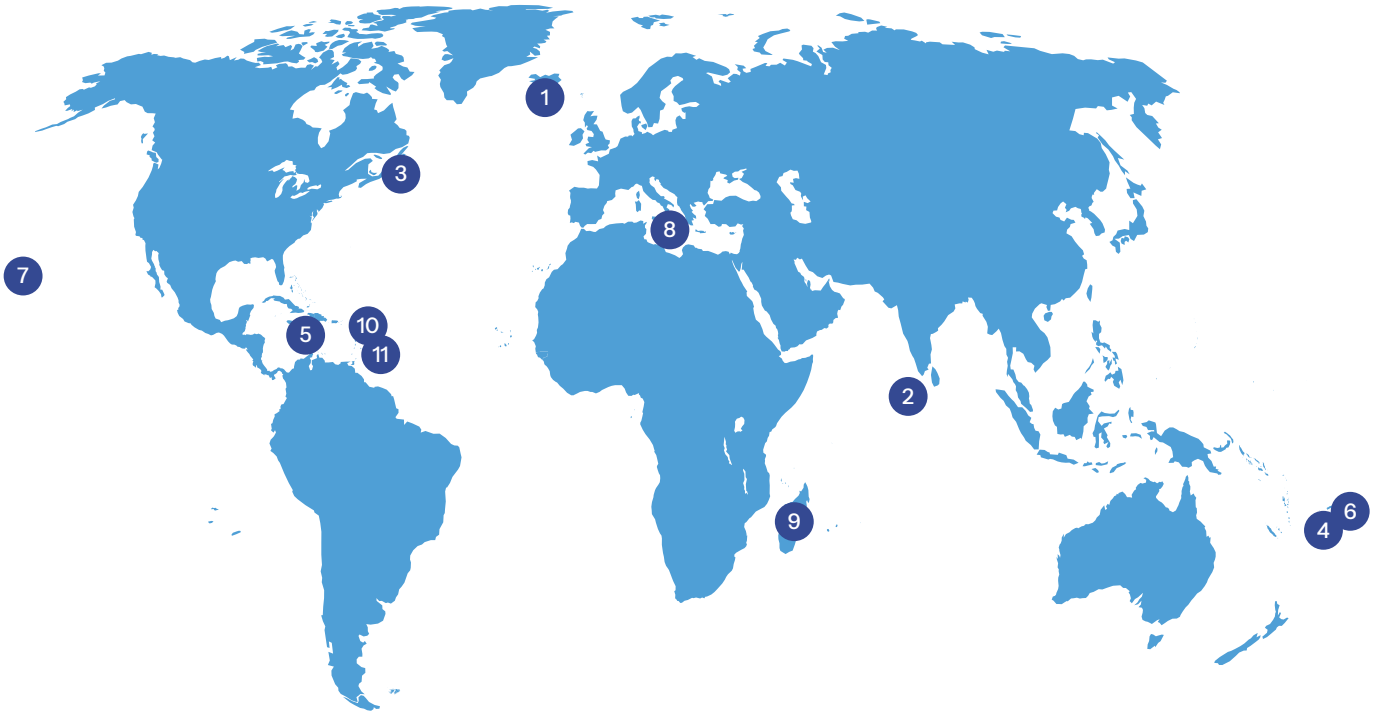
**SUMMARY:** The Caribbean Water Utilities Insurance Company (CWUIC) represents a groundbreaking approach to protecting water infrastructure through innovative disaster financing and management. Established in 2023 as a segregated portfolio company under the Catastrophe Risk Insurance Facility (CCRIF SPC), CWUIC is the first facility of its kind specifically designed to help Caribbean water utilities build resilience to natural hazards. The system operates through three integrated components: (1) The CWUIC Response Program provides preparedness planning and early recovery assistance; (2) parametric insurance through CCRIF SPC offers coverage based on event intensity (hurricane wind speed, rainfall volume, etc.) with payments made within 14 days of when policies are triggered, eliminating the need for lengthy damage assessments; and (3) the CWUIC Resilience Program supports utilities in identifying, prioritising, and structuring resilience projects while facilitating access to funding from development banks. This approach pools water utilities to create economies of scale with diversified geographic risk coverage, making parametric insurance more affordable than traditional indemnity products while providing rapid liquidity after disasters.

#### WHY THIS IS A GOOD PRACTICE?

- It demonstrates creative climate finance: It does so by providing a practical financial and logistical support system that is unattainable for individual utilities acting alone.
- It can be an example of enhanced resilience: For other island regions facing similar threats, the CWUIC offers an innovative blueprint for formalising cooperation and building tangible resilience.

[16] This good practice stems from the presentation at the Congress of Christopher Husbands.

# Case studies World map




### Theme 1: Groundwater and Lack of Data

1. Case Study 1: Iceland
2. Case Study 2: The Maldives
3. Case Study 3: Canada
4. Case Study 4: Fiji

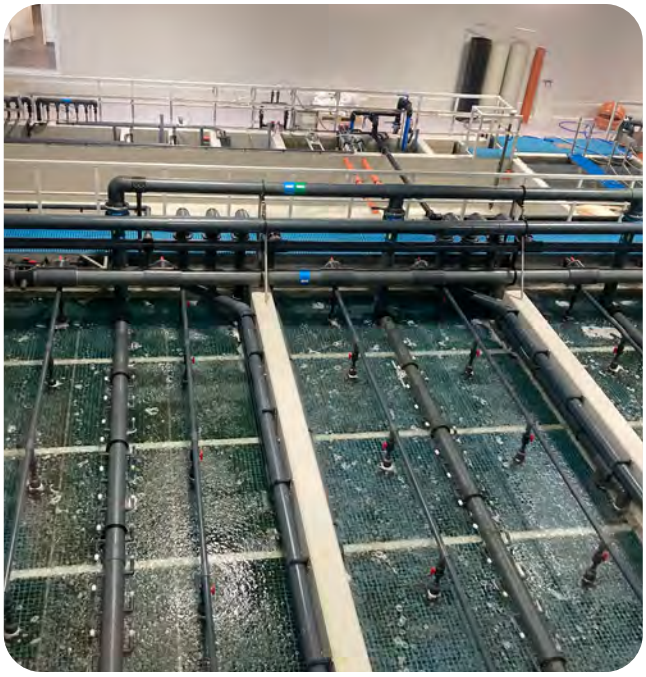
### Theme 2: Hydropower Governance

5. Case Study 1: Jamaica
6. Case Study 2: Fiji

### Theme 3: Freshwater Governance and Regulation

7. Case Study 1: Hawai, USA
8. Case Study 2: Malta
9. Case Study 3: Madagaskar
10. Case Study 4: Martinique
11. Case Study 5: Caribbean


Strategies



04

# Part four: Recommendations for the Faroe Islands in the context of their ongoing process of reforming their freshwater legislation and regulations

**This part presents concrete recommendations for the Faroe Islands in the context of their ongoing reform of freshwater governance.**

## SECTION I: PUBLIC ENGAGEMENT

The Faroe Islands will benefit from establishing a Water Forum that brings together freshwater related stakeholders from throughout the archipelago. Whilst seeds of this were planted in the run up to the 1st Islands Water Congress, co-hosted by IWRA and the Faroe Islands, and further consolidated by the side event at the Congress itself that brought together a wide range of freshwater related stakeholders[17], it is now imperative that an ongoing Forum is formally established. We recommend that the Faroe Islands Water Forum be anchored within the Faroese Geological Survey and meet in person at least once per year, in addition to holding other meetings online and regionally when needed.

[17] See Part I of this report.

The objective of the Water Forum is to leverage data on freshwater availability and to continue raising awareness of freshwater resources. Once a new water law is established (see next recommendation), the Water Forum serve as a monitoring body for its implementation. It could also develop guidelines and provide recommendations to improve the implementation of, and compliance with, the new law.

The Faroe Islands should also implement public education and engagement campaigns targeting school children and the broader public on water conservation and management practices. Doing so will help cultivate a generation that understands the importance of water resources and committed to sustainable practices. This early engagement will also help instil values and habits that will contribute to long-term water sustainability and environmental stewardship.

Public education and engagement campaigns can focus on the multifaceted value of water, encompassing its economic, social, cultural, and ecological significance in the Faroe Islands and global development. Additionally, they should address the growing impacts that increasing demands and climatic changes have on water availability.

The aim of such programmes should be to raise awareness about water uses across different sectors, promote conservation strategies and opportunities, and highlight environmental needs. These efforts could be initiated and encouraged by the government, for example, through grants, but should be implemented by stakeholders and local communities, including the public school system, the media, non-governmental organizations, and civil society groups.

## SECTION II: LEGISLATIVE

At present, the laws and implementing regulations governing freshwater resources in the Faroe Islands are heavily fragmented and some topics lack cohesive legislation. Thus, the Faroe Islands would benefit from developing a new, overarching framework law that encompasses all aspects governing of freshwater resources management in the archipelago. Should such a law not be possible, the Faroe Islands could formulate a new law that complements existing laws and regulations, lays out guiding principles, and clarifies the roles and responsibilities of relevant institutions in relation to domestic and commercial uses of freshwater through permit systems.

The Faroe Islands have a distinct legal tradition, in which laws are adapted to meet the special needs and the particularities of the island com-

munity. At the same time, legislation often builds on the traditional juridical collaborative effort and unity of the Nordic countries. Therefore, the development of a new overarching water law could build on examples from other countries, and from Nordic countries in particular[18]. Key elements of that law are described in the following sections.

A new law on freshwater should address the ownership of all freshwater resources in the Faroe Islands, laying the foundation for the governance mechanisms that can be employed. It is recommended that the governance of freshwater resources be grounded in the public interest and aligned with the human right to water, as well as with the emerging human right to a clean, healthy, and safe environment.

The law should also govern the use of all freshwater resources, including surface water, groundwater, and freshwater created through technology (such as desalinated and recycled water). It also includes water along the coast and in the fjords where freshwater and saltwater meet. Furthermore, the law should govern both the quality and quantity of freshwater resources to ensure sustainable management.

The law should also be developed to govern the use of freshwater resources by different users and sectors, including for public and private actors. The latter include actors involved in agriculture, aquaculture, drinking water, industrial uses, commercial sale, power generation, and heat generation. Additionally, it is vital to include relevant stakeholders in the development and implementation of the law to ensure the sustainable use and protection of vital freshwater resources.

The treatment criteria for municipal, industrial, and other wastewater should be clearly established within the law to protect freshwater

[18] Such as the Norwegian Water Resources Act - Act 24th of November 2000 No. No. 82 on river systems and groundwater, the Icelandic Water Management Act (No. 36 of 2011), and the Finish Water Act (No. 587 of 2011).

resources. Moreover, it is crucial to delineate the responsibilities and authorities of different governmental agencies and units involved in freshwater governance, including specifying reporting obligations, cooperation mandates, and a clear hierarchy of authority.

A new law should also clarify the current fragmented institutional landscape in the Faroe Islands. The new water law could provide a solid normative foundation for the formal establishment of the above-mentioned Water Forum. To the extent possible, it is recommended that the governance authority for freshwater resource management be placed under a single governmental agency. If this is not feasible, then delineating clear responsibilities, authorities, hierarchy, reporting obligations, and mandates for cooperation becomes even more critical to ensure effective management.

A modern legal framework would address the mechanisms, priorities, and funding for data collection on freshwater resources and their uses in the Faroe Islands. This law should specify the institutions responsible for data gathering, and establish mechanisms for sharing this data across governmental units and with the public.

The law proposed for the Faroe Islands is obviously tailored to the Faroe Islands' socio-economic reality. However, some of its key characteristics can be considered by other islands and governments as well as stakeholders therein. Some of these key characteristics relate to the law's all-encompassing nature, which brings together the management of surface water and groundwater. They also relate to a law that includes both guiding principles and more specific rules and obligations for all actors involved in the management of freshwater for different possible uses (domestic and commercial). One aspect that will continue to be discussed at future IWRA Island and Water Congresses is the extent to which a freshwater law on an island requires specific features related to its islandness, or whether the law just needs to be adapted to its socio-economic and cultural characteristics.


## ANNEX A
## IWRA ISLANDS WATER CONGRESS: QUESTIONS FOR PARTICIPANTS

IWRA's 1st Islands Water Congress asks for your responses to the following questions about freshwater usage on your island. To collate all responses, we'd kindly ask that answers be kept brief.

**NAME** _____

**EMAIL** _____

**ISLAND (OR ISLANS OF INTREST)** _____

**QUESTION 1: Where does freshwater come from on your island? [surface water, groundwater, desalinisation, etc....]**

**QUESTION 2: How is freshwater processed? [water treatment, etc...]**

**QUESTION 3: How is freshwater delivered? [system of pipes or water transfers via trucks, ...]**

**QUESTION 4: Who are the main users of freshwater? [percentages between uses by people for drinking and sanitation purposes and industry [sectors – agriculture, hospitality, etc....]**

**QUESTION 5: How is freshwater disposed? [sewage system and where does the water end up]**

**VISUAL COMPONENT:**

**If you would like to share an image or photograph of your island, please upload it to this document below. (Alternatively, please send images to: mclose@upei.ca)**

**Please attach image(s) on this page:**

## ANNEX B
## WORKSHOP ON WATER SUPPLY AND USE IN THE FAROE ISLANDS

**THURSDAY, 5 SEPTEMBER, 2024**

**Venue:** Registration at the Nordic House; workshop sessions in the Broadcasting Hall, Kringvarpið (main entrance KVF)

| TIME | SESSION |
|---|---|
| **08:30 – 09:00** | Registration at the Nordic House |
| **09:00 – 09:05** | Welcome |
| **09:05 – 09:20** | Tráin P. Nónklett, University of the Faroe Islands<br>Water Supply and Water Use in the Faroe Islands – A Historical Perspective |
| **09:20 – 09:25** | Questions & Discussion |
| **09:25 – 09:40** | Birita F. Kjærbæk, Environment Agency Protection of Surface Water |
| **09:40 – 09:45** | Questions & Discussion |
| **09:45 – 10:05** | Coffee Break |
| **10:05 – 10:20** | Jóngerð Juul Olsen, Environmental Officer, Runavík Municipality Is a Secure Water Supply a Given? |
| **10:20 – 10:25** | Questions & Discussion |
| **10:25 – 10:40** | Knud Simonsen, Vørn – Meteorological Office<br>Measuring Precipitation Amounts and Their Impact on Stream Flow in Fjords |
| **10:40 – 10:45** | Questions & Discussion |
| **10:45 – 11:05** | Coffee Break |
| **11:05 – 11:20** | Janus Vang, Department Head, MIKRO & Arni Petersen, Inspector MVD, Public Health Laboratory<br>Water Samples and Results from the 2024 Water Initiative |
| **11:20 – 11:25** | Questions & Discussion |
| **11:25 – 11:40** | Jana Ólavsdóttir, Geologist, Jarðfeingi (Geological Survey of the Faroe Islands) Status of Groundwater in the Faroe Islands |
| **11:40 – 11:45** | Questions & Discussion |
| **11:45 – 12:00** | Summary, Open Questions, and Closing Remarks |
| **12:30 – 14:00** | Lunch at the Nordic House |

| Topic | Arrows colours Fig. 6 | Primary Parliamentary Law | Ministry | Secondary implementing law | Purpose of the law |
|---|---|---|---|---|---|
| Drinking, Industrial production and Energy water | Groundwater | Løgtingslóg nr. 53 frá 28. apríl 2000 um vatnið í sumbiarbergholinum, sum broytt við løgtingslóg nr. 55 frá 16. mai 2006 | **Ministry of Foreign Affairs, Industry and Trade** | | Administering the water that runs down into the Sumbiartunnel |
| | | Løgtingslóg nr. 77 frá 1. juni 2023 um grundvatn | | Kunngerð nr. 121 frá 17. november 2023 um at gagnnýta grundvatn | Law regarding private and industrial administration of groundwater. |
| | Surface water | Lov nr. 169 af 18. maj 1937 for Færøerne om Benyttelse af Indsøer og Vandløb, sum seinast broytt við løgtingslóg nr. 91 frá 7. juni 2020 | | Kunngerð nr. 76 frá 5. oktober 1963 um loyvi givið interkommunala ravmagnsfelagnum S.E.V. til nýtslu av vatnkraftini v.m. | Law regarding all surface water. The [regulation or secondary law] controls the license issued to SEV, the company owned by all Faroese municipalities that uses surface water for hydro power production. |
| | Surface and Hydropower Energy | Løgtingslóg nr. 58 frá 11. apríl 2025 um broyting í løgtingslóg um el riknar hitapumpuskipanir | **Ministry of Environment** | Kunngerð nr. 101 frá 15. oktober 2012 um skipanir til upphiting við hitapumpum, sum seinast broytt við kunngerð nr. 69 frá 30. apríl 2025 | Law regarding electric heat pumps, including geothermal wells. This Law requires that groundwater measurements are carried out in all geothermal wells and it gives the authority possibility to require actions if the well affects the groundwater in areas. |

| | | | | | |
|---|---|---|---|---|---|
| Drinking and Industrial production | Ground- and Surface water | Løgtingslóg nr. 58 frá 26. mai 2010 um matvørur v.m., sum seinast broytt við løgtingslóg nr. 102 frá 13. juli 2017 | Ministry of Foreign Affairs, Industry and Trade | Kunngerð nr. 74 frá 26. mai 2020 um kelduvatn og natúrligt mineralvatn | Law and its [regulations or secondary laws] regarding private household and industrial water quality. |
| | | | | Kunngerð nr. 73 frá 22. mai 2014 um gjøld fyri umsjón, sum Heilsufrøðiliga starvsstovan fremur í sambandi við útflutning til Russland, Kazakstan og Hvítarussland, t.e. Tollsamgongan, og Kina | |
| | | | | Kunngerð nr. 127 frá 22. november 2013 um veiting av drekkivatni, sum broytt við kunngerð nr. 103 frá 9. juli 2019 | |
| | | | | Kunngerð nr. 161 frá 18. desember 1995 um heilsufrøðiligan rakstur, viðgerð av fiski og fiskaúrdrátti og løggilding av fiskiførum | |
| | | | | Kunngerð nr. 25 frá 26. mars 1996 um at merkja liðugt pakkaðar matvørurw | |
| | | | | Kunngerð nr. 114 frá 15. august 2001 um innaneftirlit, sum broytt við kunngerð nr. 8 frá 5. februar 2003 | |

| | | | | | |
|---|---|---|---|---|---|
| Drinking and Industrial production | Ground- and Surface water | | Ministry of Foreign Affairs, Industry and Trade | Kunngerð nr. 122 frá 24. august 2001 um viðgerð, keyp og sølu v.m. av fiski og fiskavørum á landi, sum seinast broytt við kunngerð nr. 128 frá 28. desember 2010 | |
| | | Lov nr. 60 af 24. april 1896 om Beskyttelse af Vandforsyningsanlæg, sum broytt við lov nr. 127 frá 15. apríl 1930 | | | Law regarding protection of water supply areas and compensation to landowner for causing loss or damage due to establishment of water supply areas. |
| | | Lov nr. 63 af 1. april 1909 for Færøerne om Vandledninger | Ministry of Environment | | Law controlling water quality and compensation due to landowners for land and water taken for public use. |
| | | Lov nr. 48 af 24. marts 1899 om Tilvejebringelse af Vedtægt for Benyttelsen af Vand fra Tórshavns Vandværk | | Bekendtgørelse om en af Justitsministeriet stadfæstet Vedtægt for Benyttelsen af Vand fra Tórshavns Vandværk, som senest ændret ved lov nr. 186 af 7. juli 1958 | Law and regulations controlling the use of water in the municipality of Tórshavn |

| | | | | | |
|---|---|---|---|---|---|
| Wastewater | Wastewater | Løgtingslóg nr. 134 frá 29. oktober 1988 um umhvørvisvernd, sum seinast broytt við løgtingslóg nr. 168 frá 16. desember 2021 | Ministry of Environment | Kunngerð nr. 186 frá 5. november 1993 um spillvatnsevju, sum broytt við kunngerð nr. 90 frá 28. september 2007 | Environmental law and its [regulations or secondary laws] (includes only [regulations or secondary laws] that affect water resources in general) |
| | | | | Kunngerð nr. 124 frá 11. september 2018 um at fyribyrgja dálking frá oljutangum | |
| | | | | Kunngerð nr. 72 frá 29. mai 2012 um taðing, sum broytt við kunngerð nr. 11 frá 18. februar 2020 | |
| | | | | Kunngerð nr. 111 frá 7. september 2009 um spillivatn | |
| | | | | Kunngerð nr. 147 frá 19. oktober 1995 um burturkast, sum broytt við kunngerð nr. 90 frá 28. september 2007 | |
| | | | | Kunngerð nr. 186 frá 5. november 1993 um spillvatnsevju, sum broytt við kunngerð nr. 90 frá 28. september 2007 | |

| | | | | | |
|---|---|---|---|---|---|
| Wastewater | Wastewater | Løgtingslóg nr. 134 frá 29. oktober 1988 um umhvørvisvernd, sum seinast broytt við løgtingslóg nr. 168 frá 16. desember 2021 | Ministry of Environment | Kunngerð nr. 49 frá 2. apríl 1990 um umhvørvisgókenning av brennistøðum og tyrvingarplássum, sum broytt við kunngerð nr. 90 frá 28. september 2007 | Environmental law and its [regulations or secondary laws] (includes only [regulations or secondary laws] that affect water resources in general) |
| | | | | Kunngerð nr. 54 frá 9. juni 1989 um tjalding | |
| | | | | Kunngerð nr. 40 frá 9. apríl 1992 um lívrunnið burturkast frá alivinnuni, sum broytt við kunngerð nr. 90 frá 28. september 2007 | |

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