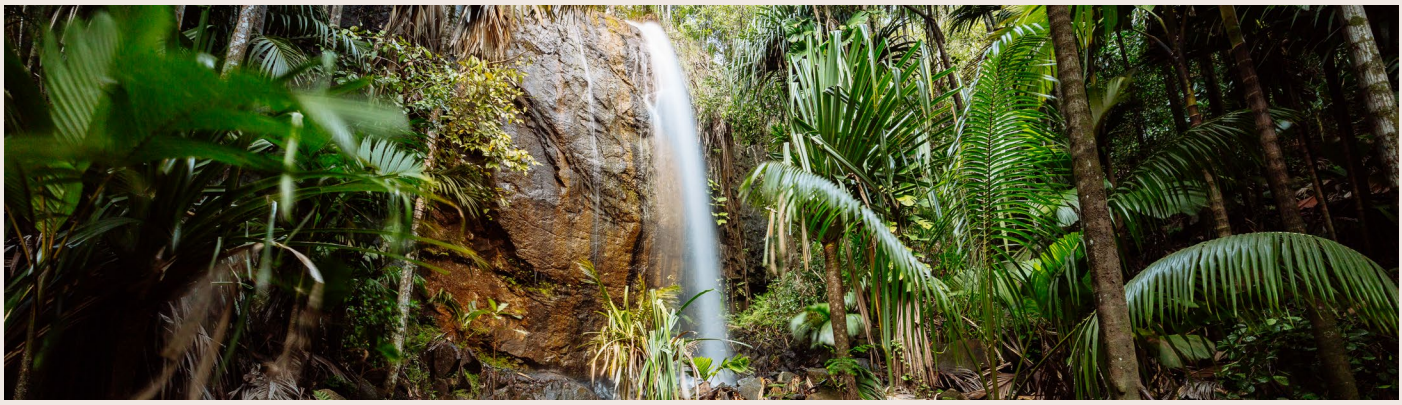
Prepared by Gaea Seychelles with input from the
Ministry of Environment, Climate, Energy and Natural Resources

POLICY BRIEF 1

From Ridge to Reef: Strengthening freshwater biodiversity monitoring and enforcement in the Seychelles. A project by Gaea Seychelles.

Integrating biological indices and nature-based solutions into the national environmental framework.



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Executive Summary

The freshwater ecosystems of the Seychelles host unique biodiversity yet remain the nation's least protected and most threatened habitats. Increasing pressure from urban development, pollution, invasive species, and climate change continues to degrade these vital systems. This brief identifies critical gaps in legal protection and data integration, outlining strategic actions to safeguard freshwater biodiversity as a cornerstone of the Seychelles' environmental and climate resilience.

Why freshwater biodiversity matters

- **Endemic sanctuary:** Supports native species found nowhere else on Earth.
- **Natural infrastructure:** Maintains water quality via natural filtration and regulates groundwater recharge.
- **Disaster mitigation:** Protects coastal zones by regulating floods and buffering climate impacts.
- **Blue economy support:** Provides essential ecosystem services for agriculture and tourism.

Critical gaps in protection

1. **Fragmented legal** framework: Absence of dedicated legislation for freshwater conservation; inconsistent prioritisation of aquatic health in Environmental Impact Assessments (EIAs).
2. **Institutional overlap:** Conflicting responsibilities across ministries lead to poor coordination between water management and land-use planning.
3. **The data void:** Lack of a centralised national inventory for aquatic flora and fauna hinders evidence-based decision-making.
4. **Invasive & anthropogenic threats:** Spread of invasive species, risk from aquarium trade risks and domestic/ industrial runoff are disrupting native ecosystems.
5. **Climate vulnerability:** Altered rainfall and prolonged droughts are shrinking critical habitats, increasing extinction risks for niche-specialised species.

Biodiversity Matters



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'Losing Our Heritage: Our unique, ancient Mayflies cannot survive in polluted waters.'

The Silent Warning: Mayflies As Sentinels

The Problem:

Mayflies, key bioindicators of clean water, are entirely absent from several downstream sites. Their disappearance indicates chronic pollution levels that exceed the species' physiological tolerance.

The Impact:

- Ecological Collapse: Without these 'clean water' species, the food web that supports fish and birds breaks down.
- Legal Failure: This absence highlights a direct failure to meet the water quality standards intended by the Environment Protection Act.
- The Solution: We must restore the physical and chemical conditions, such as high dissolved oxygen and low siltation, required for these sensitive species to return. Their comeback will be the ultimate proof of successful river restoration.

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Priority Recommendations

IMMEDIATE ACTIONS (YEAR 1)

- Standardise monitoring: Launch a national, long-term water quality monitoring programme with unified protocols.
- Centralise data: Establish a national freshwater database with formal data-sharing agreements between agencies.
- Formalise maintenance: Implement Standard Operating Procedures (SOPs) for river and wetland cleaning contractors. Certified environmental training should be a prerequisite for all government contracts.
- Prioritise nature-based solutions (NbS): Mandate 'Green infrastructure' over 'Grey infrastructure' (hard engineering) in all upcoming river management plans.

MEDIUM-TERM (1–3 YEARS)

- Spatial policy integration: Embed freshwater biodiversity requirements directly into national land-use and spatial planning policies.
- EIA reform: Strengthen regulations to make Freshwater biodiversity impact assessments a mandatory component of the EIA process.
- Watershed governance: Empower local watershed committees to oversee the governance and restoration of priority catchments.

LONG-TERM (OVER 3 YEARS)

- Legally protected zones: Establish freshwater conservation zones based on IUCN Key Biodiversity Area (KBA) standards to ensure permanent protection of critical habitats.

Enforcement gap



'Invisible Degradation: A lack of long-term monitoring allows runoff and invasive species to destroy freshwater habitats before enforcement can even begin.'

Act Now: Close The Data Gap

The Problem:

We cannot manage what we do not measure. Without a centralised database, pollution 'hotspots' remain invisible to enforcement officers.

The Solution:

Immediate: Establish the National Freshwater Inventory. Year 1: Deploy miniSASS as a standard early-warning tool for the Pollution Control Unit.

Planning gap



'Engineering a dead zone: Rock-armouring and concrete-lining eliminate the natural habitats required by native species. While providing fast drainage, these 'grey' structures increase downstream flood risks and offer zero biological filtration.'

Building With Nature, Not Against It

The Problem:

Current engineering favours 'Grey Infrastructure' (concrete walls and canals). This accelerates runoff, causes downstream flooding, and destroys the 'self-cleaning' capacity of natural riverbanks.

The Solution:

- Planning: Mandate a 5-meter minimum 'No-Clear' buffer for all new river-adjacent developments.
- Infrastructure: Replace concrete canals with Nature-based Solutions (NbS) like vegetated channels to filter silt.
- Outcome: Improved flood protection and a healthier Ridge-to-Reef transition for our coastal tourism zones.

About Gaea Seychelles
Gaea Seychelles is a research and citizen science-based organisation launched in 2018. Its mission is to empower and mobilise actions by local actors to undertake impactful environmental community-based projects which creates significant and sustained change for the betterment of people's lives and their environment.

For more information:
www.gaeaseychelles.sc
gaea@gaeaseychelles.sc
+248 2 50 27 84
Centre for Environment and Education, Anse Royale, Seychelles