

Recovered Wastewater Option Analysis Mauri-based Assessment of Infrastructure Belonging. Arikiroa Discharge / Wetlands to Rotorua / Infiltration



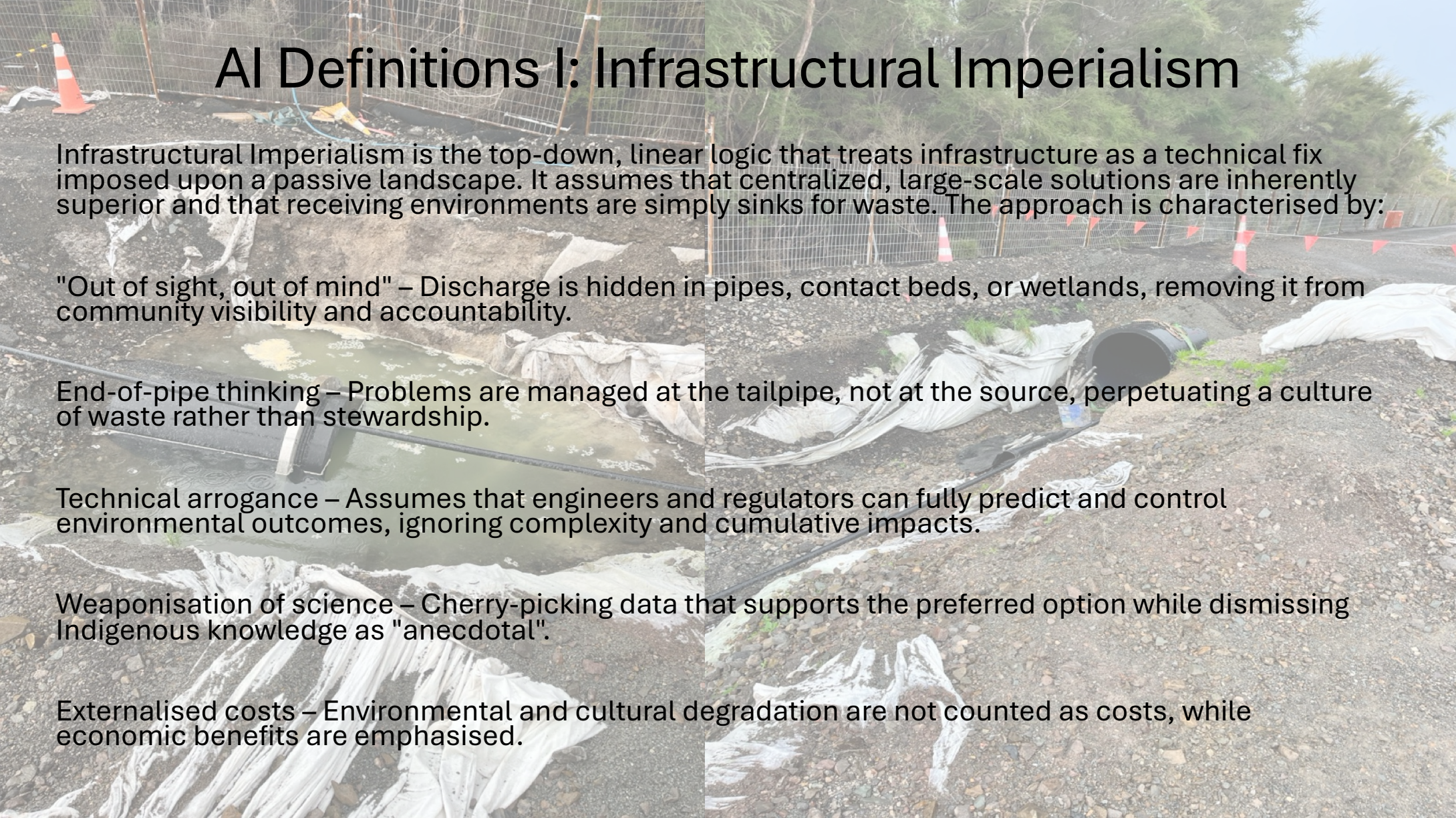
Dr Kēpa Morgan Dist.FEngNZ
Ngāti Pikiao, Ngāti Kahungunu, Ngāi Tahu

Mahi Maioro Professionals Ltd

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Outline

- Rotorua Lakes Council and Te Arawa - inconsistent ways of knowing?
- We can choose to perpetuate a legacy of **Infrastructural Imperialism**, or
- Mauri Model / mauri0meter as ways of assessing **Infrastructure Belonging**
- The assessment process and mauri-based measurement of impacts
- Timeline for Mauri Impacts Assessment - 2025 to 2075 (50 years)
- Analysis Results: Dimension Trends and Cumulative Impact Quantification
- Info-graphics that summarise and communicate what this means
- Pātai / Korero



AI Definitions I: Infrastructural Imperialism

Infrastructural Imperialism is the top-down, linear logic that treats infrastructure as a technical fix imposed upon a passive landscape. It assumes that centralized, large-scale solutions are inherently superior and that receiving environments are simply sinks for waste. The approach is characterised by:

"Out of sight, out of mind" – Discharge is hidden in pipes, contact beds, or wetlands, removing it from community visibility and accountability.

End-of-pipe thinking – Problems are managed at the tailpipe, not at the source, perpetuating a culture of waste rather than stewardship.

Technical arrogance – Assumes that engineers and regulators can fully predict and control environmental outcomes, ignoring complexity and cumulative impacts.

Weaponisation of science – Cherry-picking data that supports the preferred option while dismissing Indigenous knowledge as "anecdotal".

Externalised costs – Environmental and cultural degradation are not counted as costs, while economic benefits are emphasised.

AI Definitions II: Infrastructural Belonging

Infrastructure Belonging is the relational, circular logic that treats infrastructure as the physical expression of community belonging. It asks: Does this infrastructure enhance the mauri of the communities it serves? This approach is characterised by:

Visible and accountable – Infrastructure is designed to be seen and understood by the community it serves, fostering stewardship.

Source-to-sink thinking – Problems are addressed at origin, with pre-treatment at source and reuse, minimising waste generation.

Humility and adaptability – Acknowledges ecological complexity and embraces adaptive management, learning from place-based knowledge.

Integration of knowledge systems – Mōhiotanga (Māori knowledge) sits alongside reductionist science as a valued, equal partner.

Internalised costs – Full accounting of environmental, cultural, social, and economic impacts, including intergenerational effects.

Infrastructure through whose Lens?

The taught Municipal Engineering worldview:

- Infrastructure “belongs” if it is cost effective, resource consent compliant, and can withstand a politically tolerable level of public complaint.
- Cultural, ecological and social dimensions are treated as secondary constraints to be “managed” rather than as primary values to be restored.

Te Arawa Epistemology: ***Te Rotorua Nui A Kahumatamomoe has Mana***

“Mēnā e kore te wai, e kore te mauri. Mēnā e kore te mauri, e kore te tangata.”

If there is no water, there is no life force. If there is no life force, there are no people

“Ko te mauri matangaro, e kore e kitea.

Ina rā, ka mātanga te ine i tēnei mea te mauri, ka mātua te Iwi.”

Mauri cannot be seen. However, the ability to measure mauri is a skill that elevates the People



MAURI MODEL



Rangatiratanga

Kaitiakitanga



Wai

Tāonga species



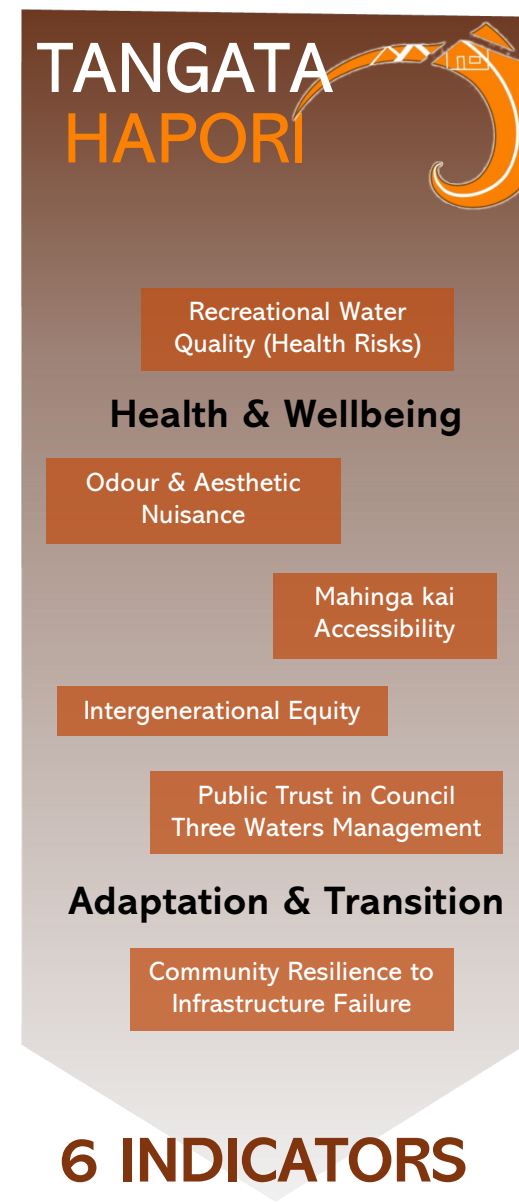
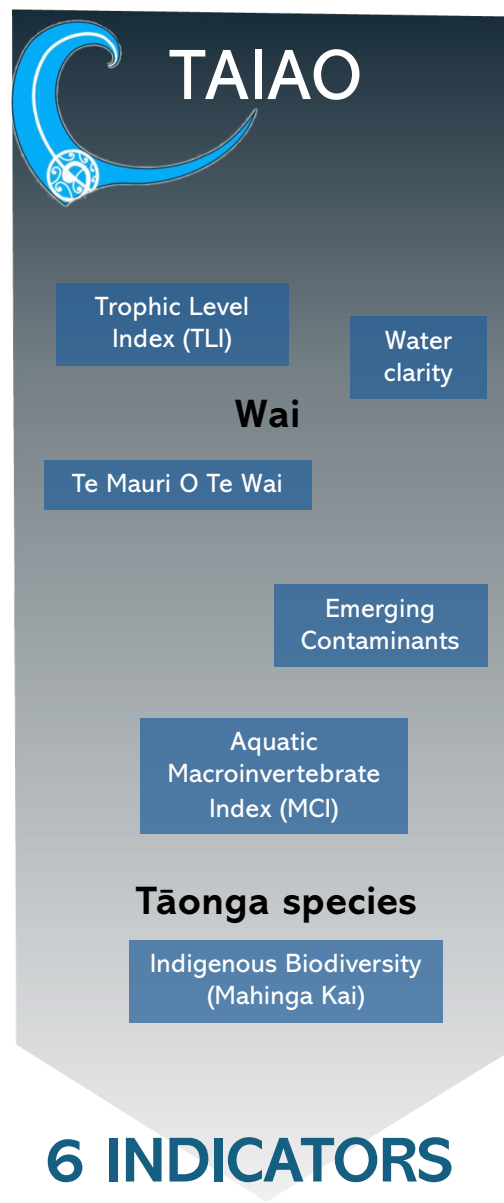
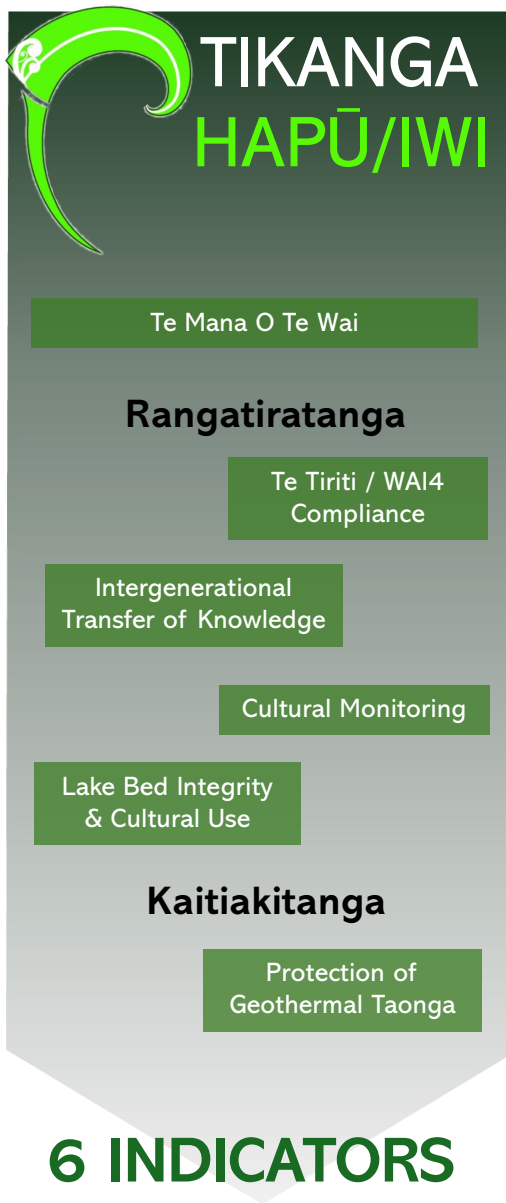
Health & Wellbeing

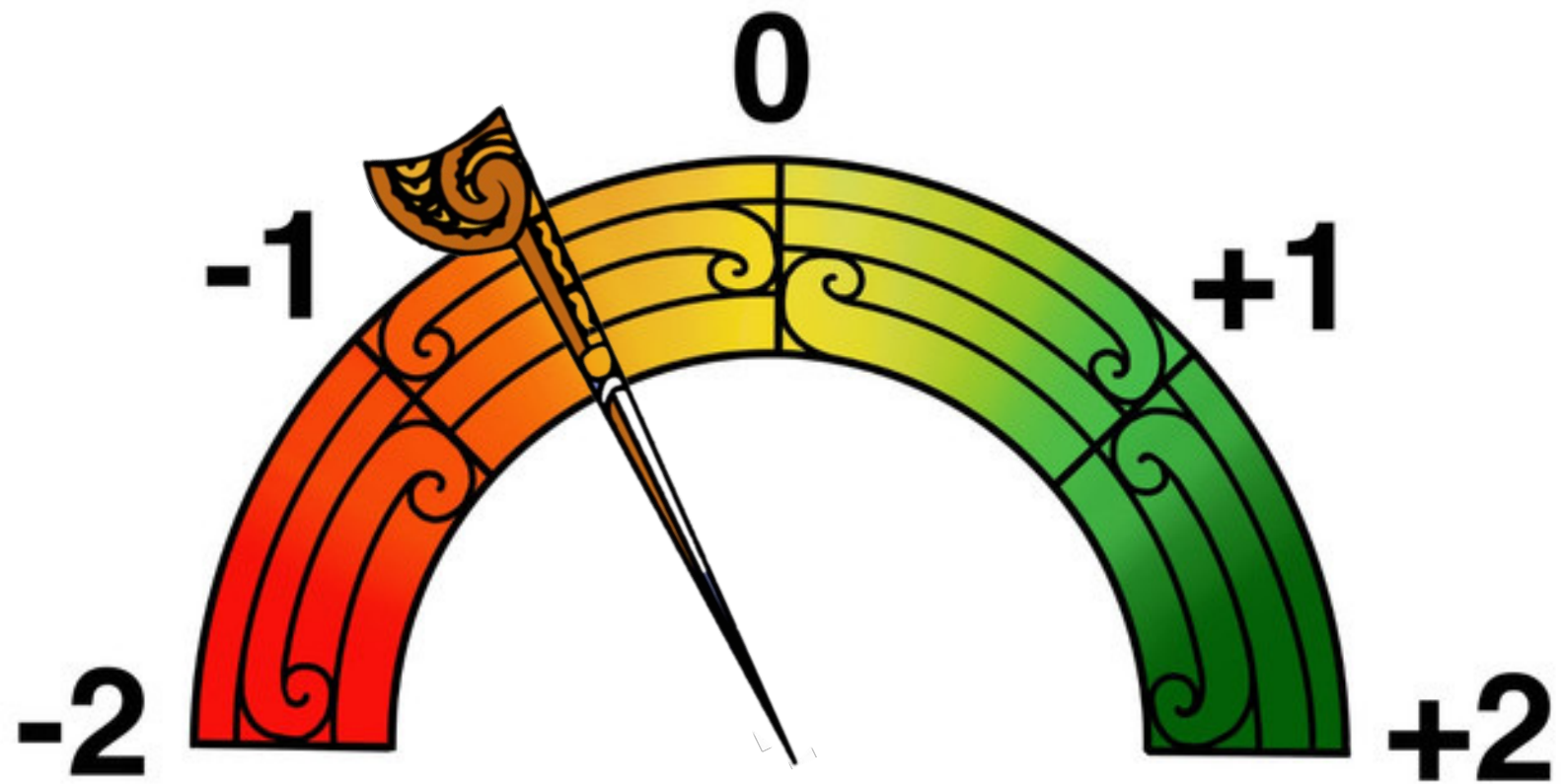
Adaptation & Transition



Costs

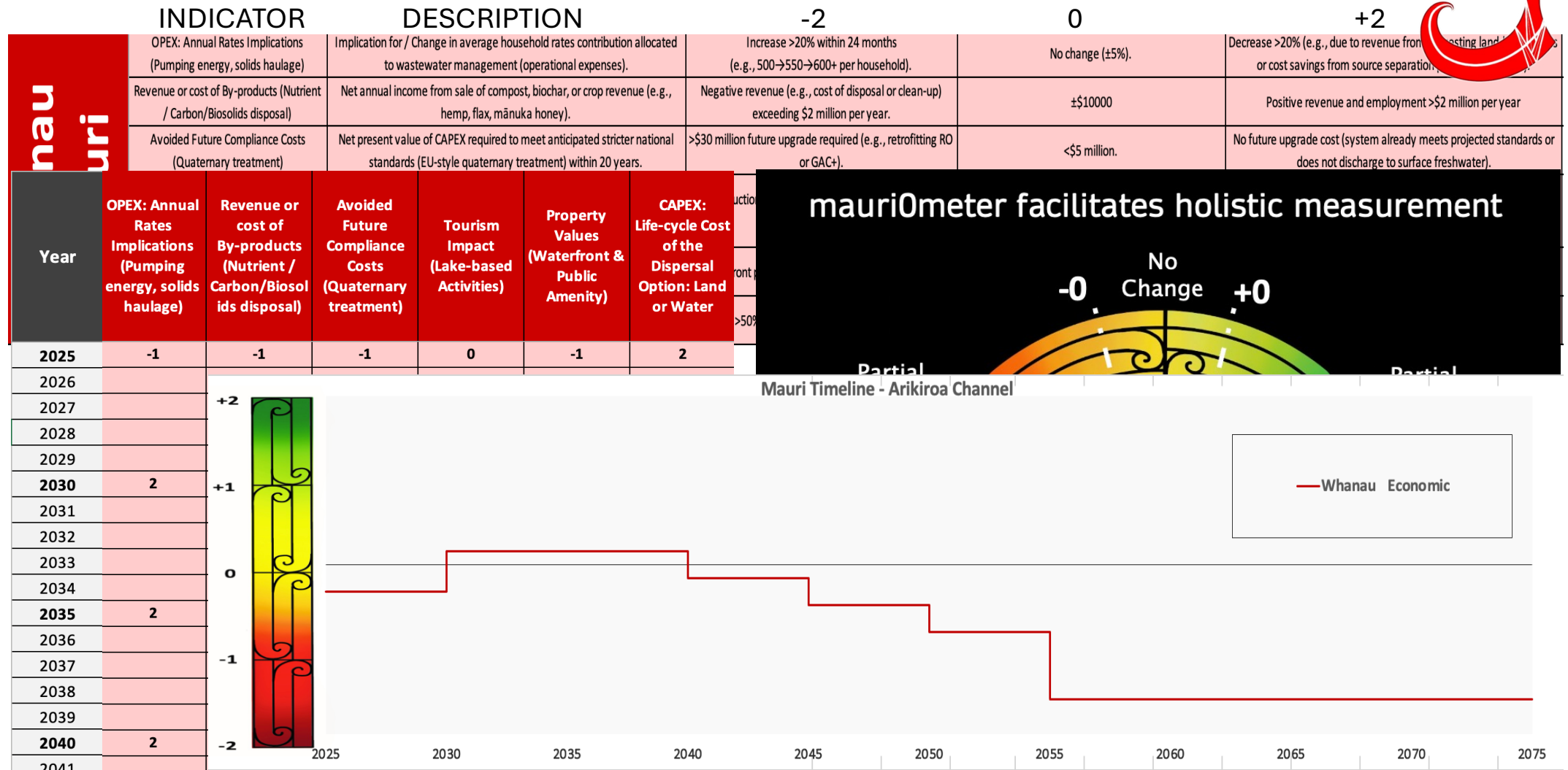
Financial Sustainability



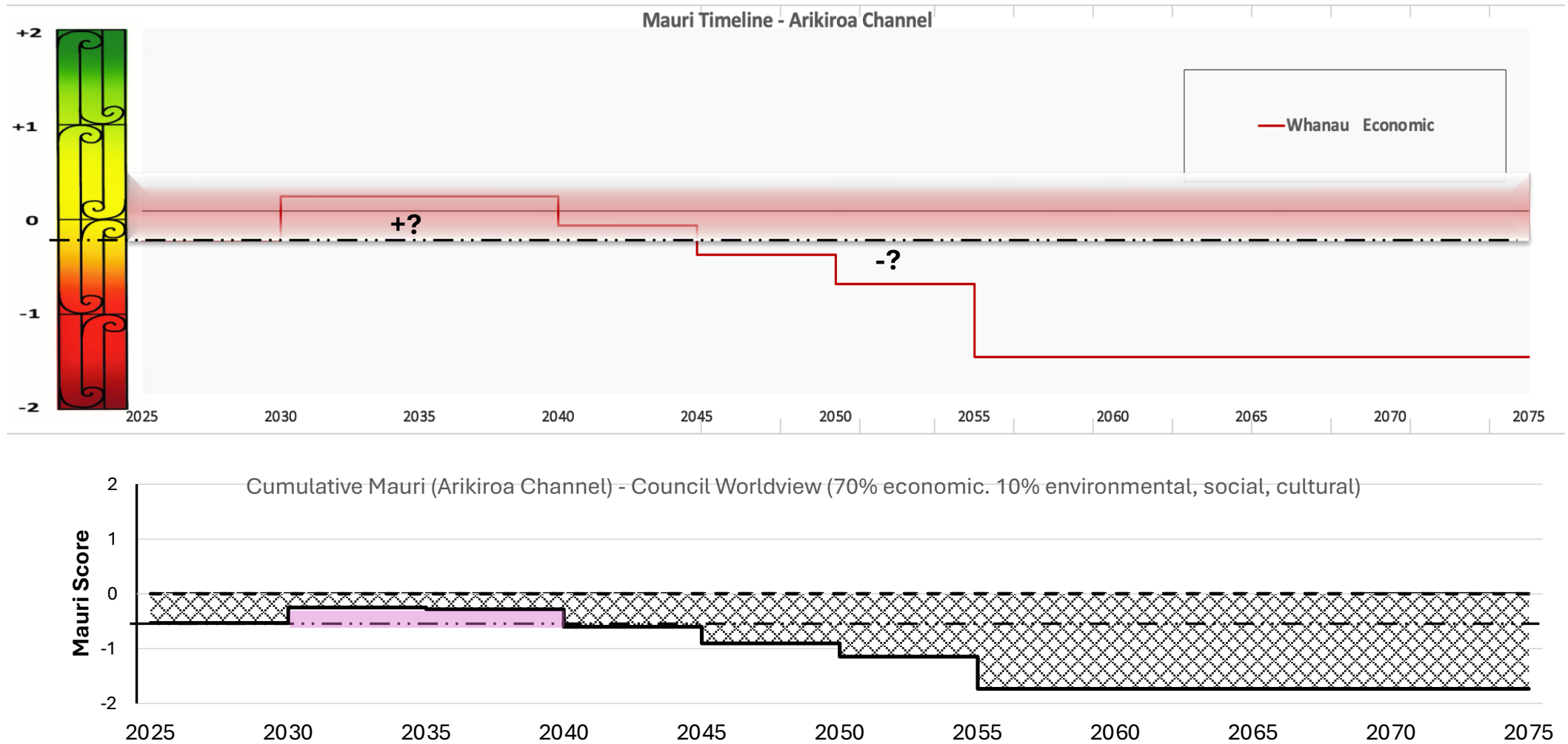


MAURI-O-METER

Eg: Process for Analysis - Whairawa / Whānau / Economic



Understanding the Results: Cumulative Impact



Communicating The Results

Use mauri to measure Infrastructure Belonging



Mauri of the
HAPŪ/IWI

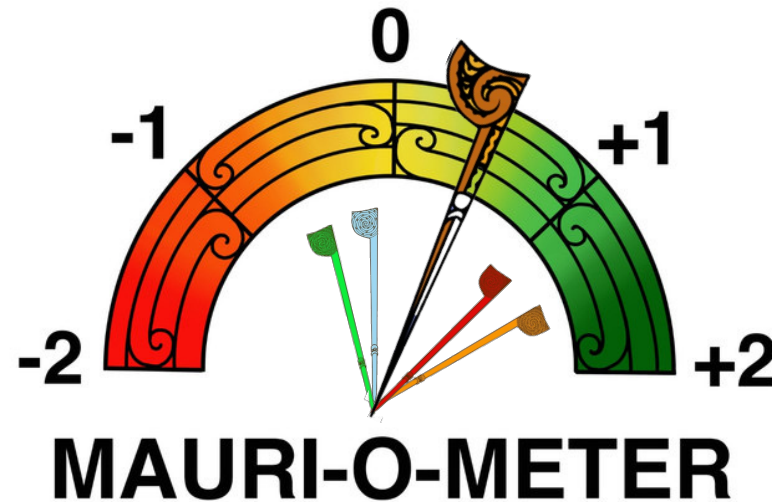
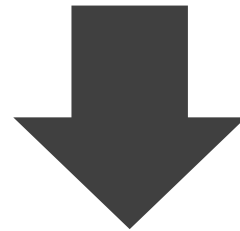


Mauri of the
TAIAO

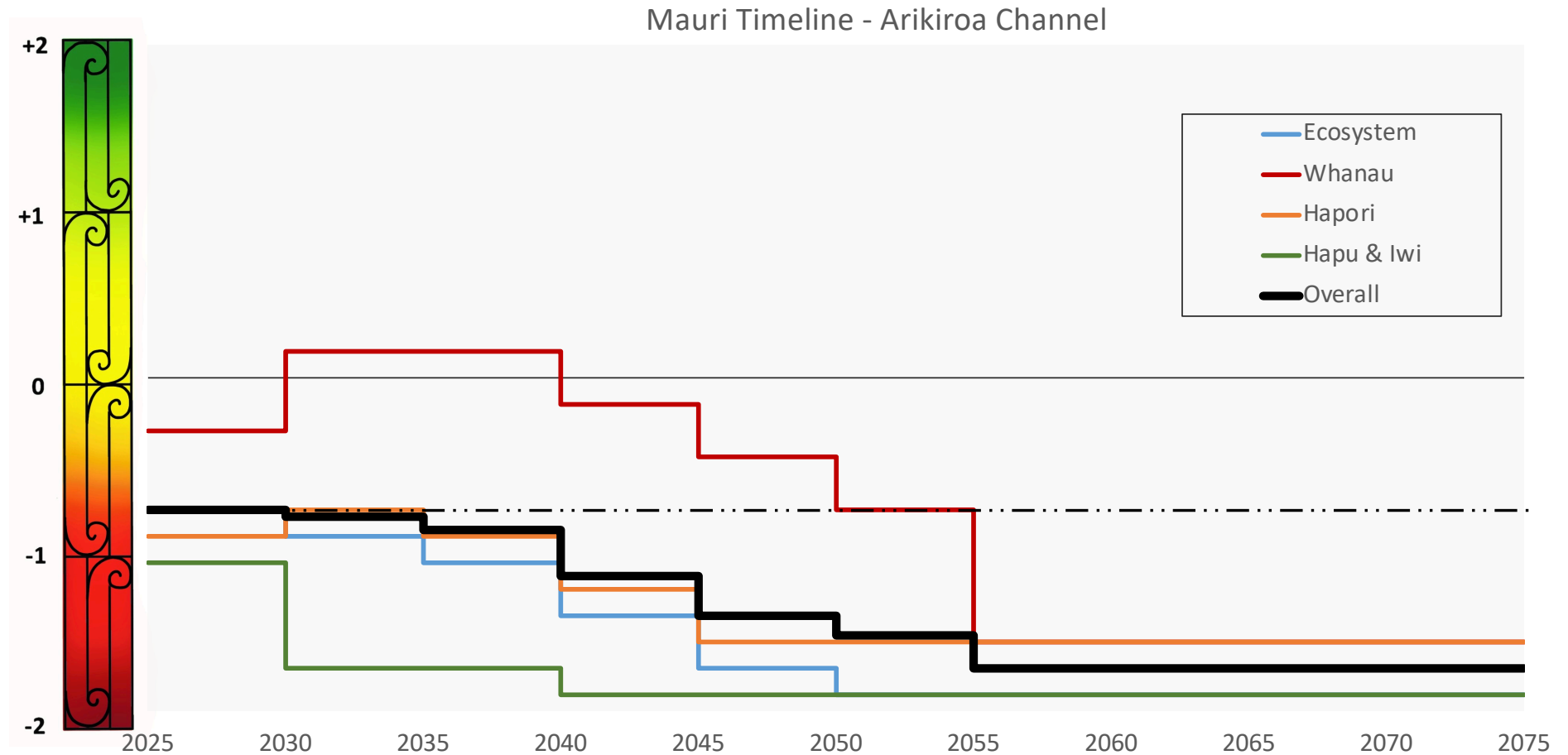
Mauri of the
HAPORI



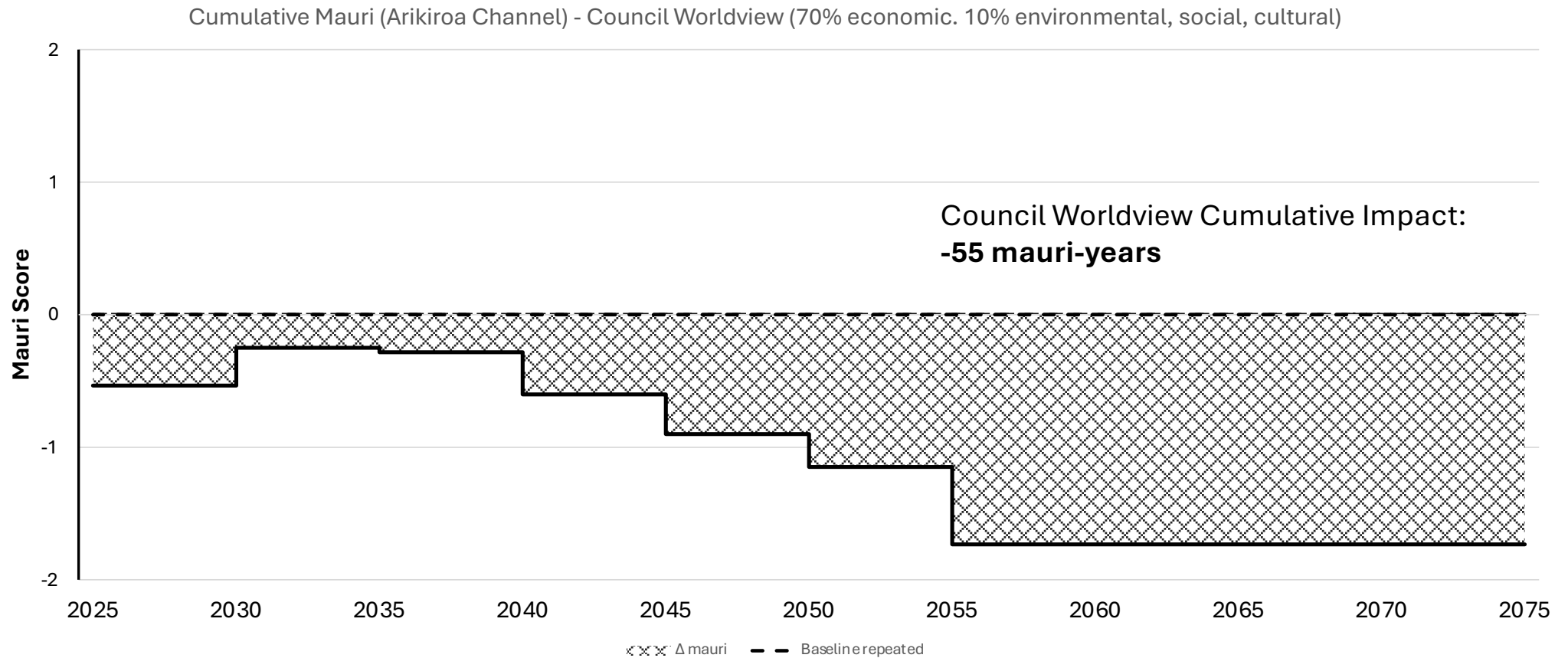
Mauri of the
WHĀNAU



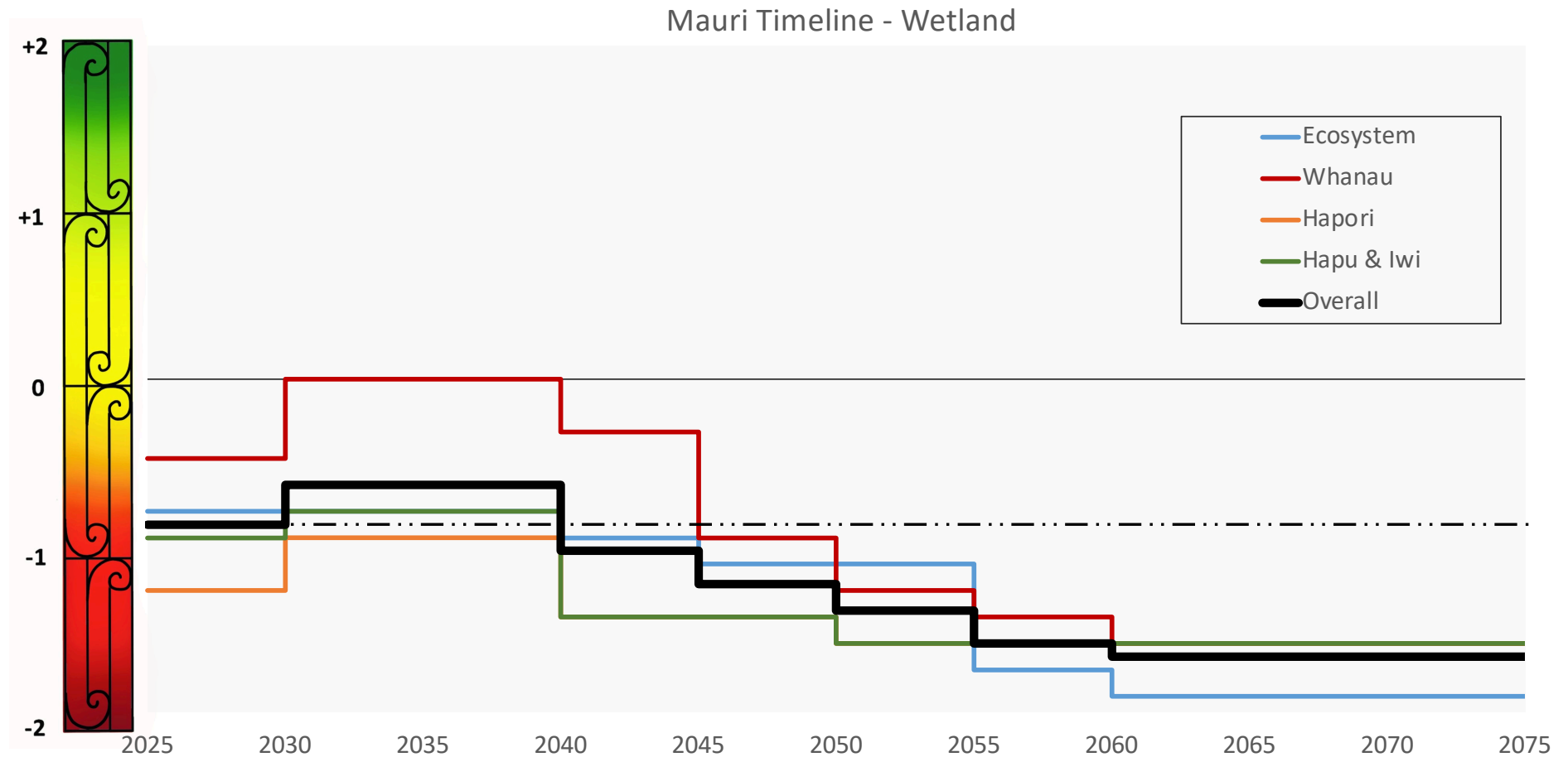
Arikiroa Discharge Mauri Dimension Trends



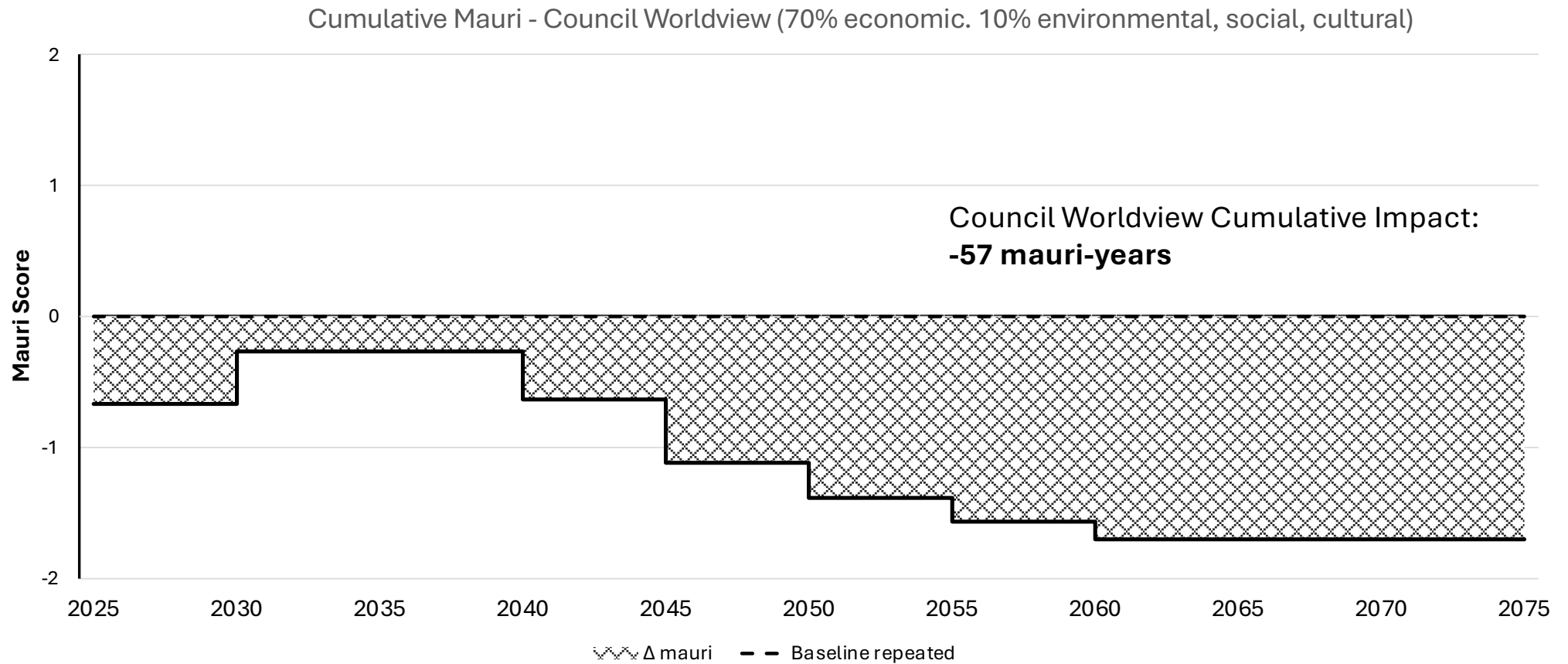
Arikiroa Discharge Cumulative Mauri Impact



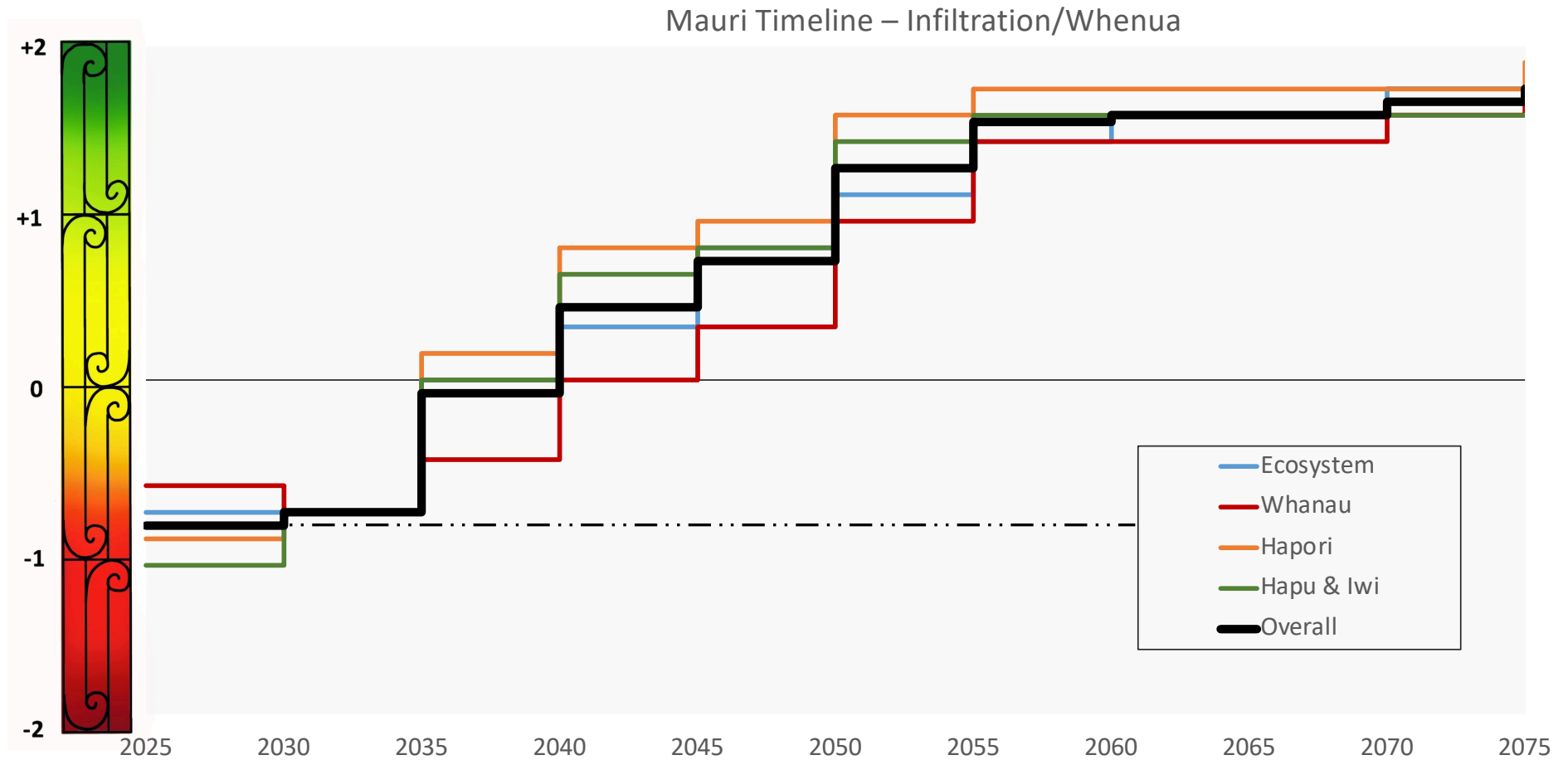
Wetland Discharge Mauri Dimension Trends



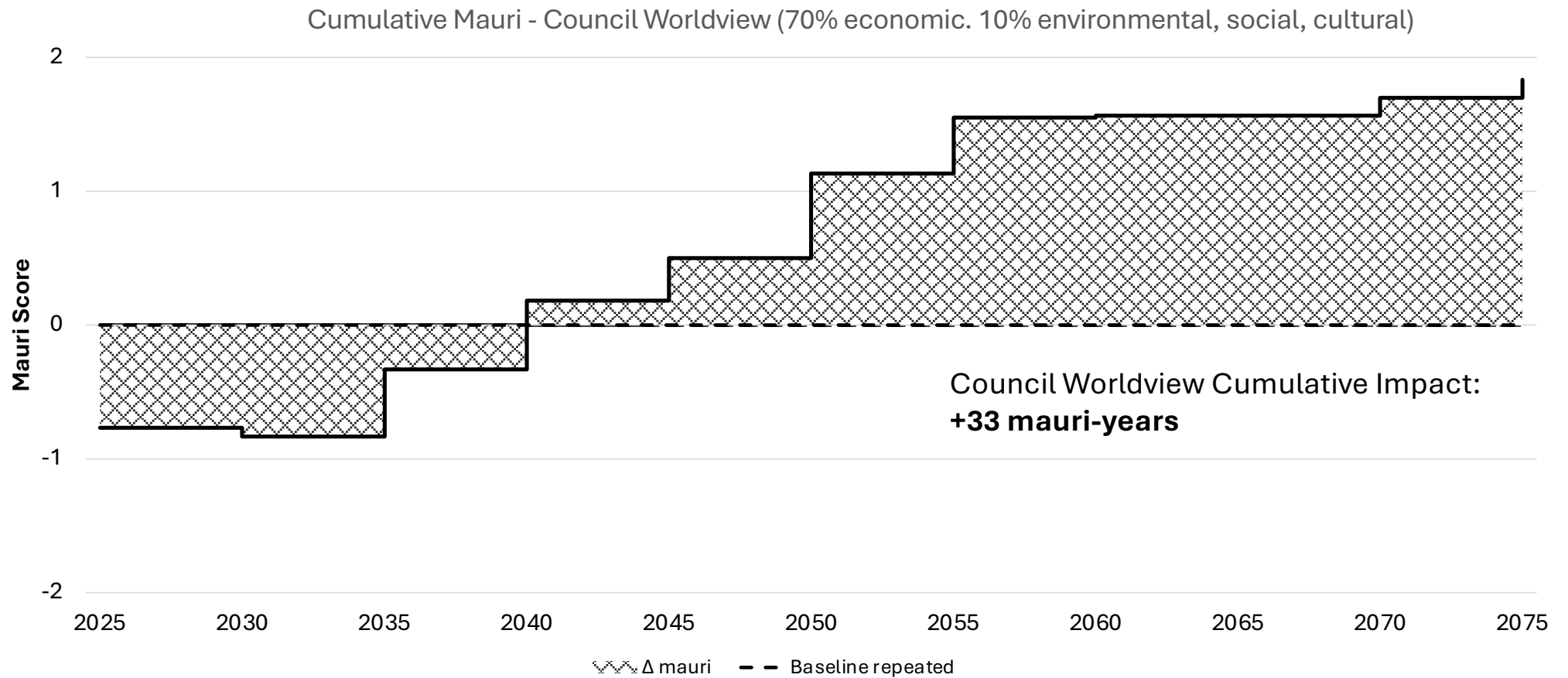
Wetland Discharge Cumulative Mauri Impact



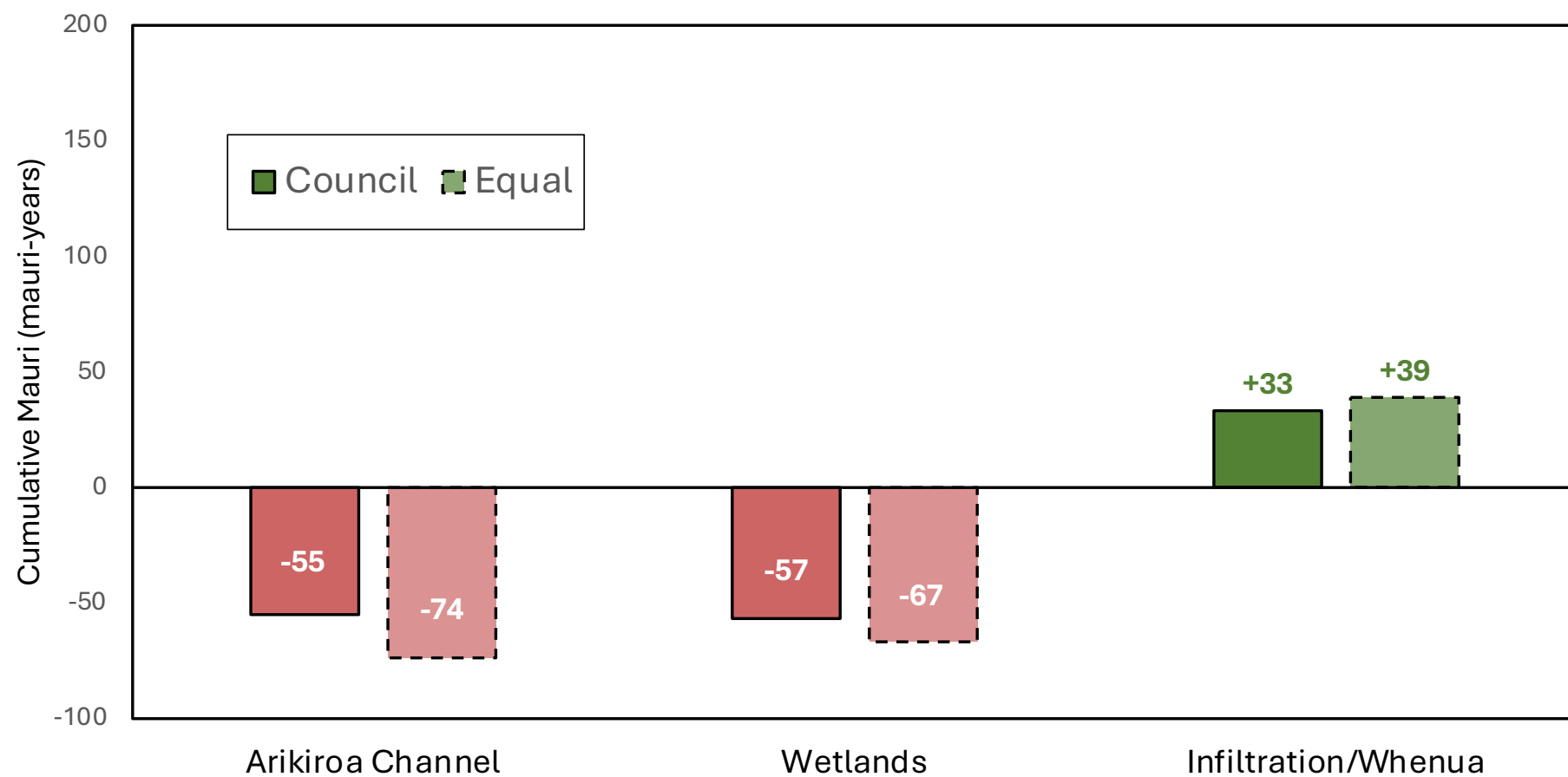
Infiltration Discharge Mauri Dimension Trends



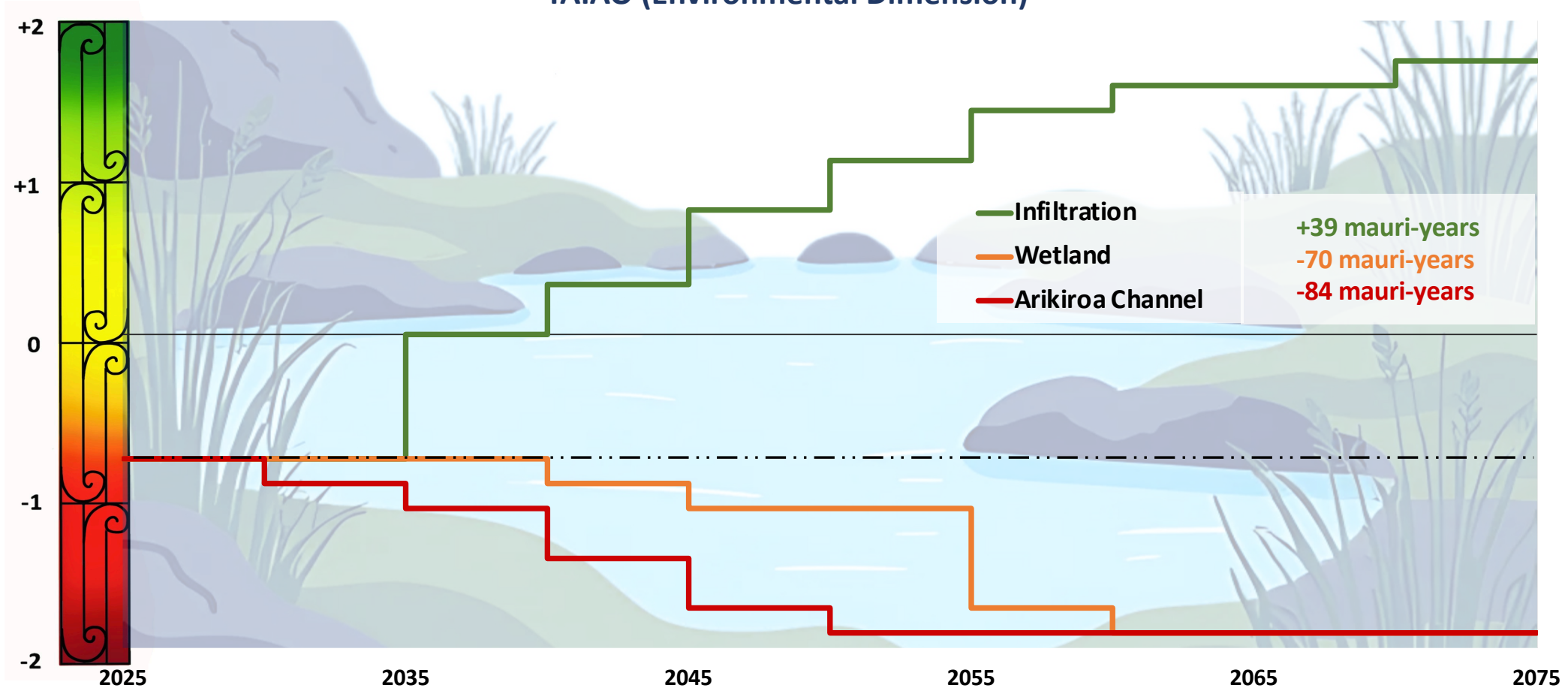
Infiltration Discharge Cumulative Mauri Impact



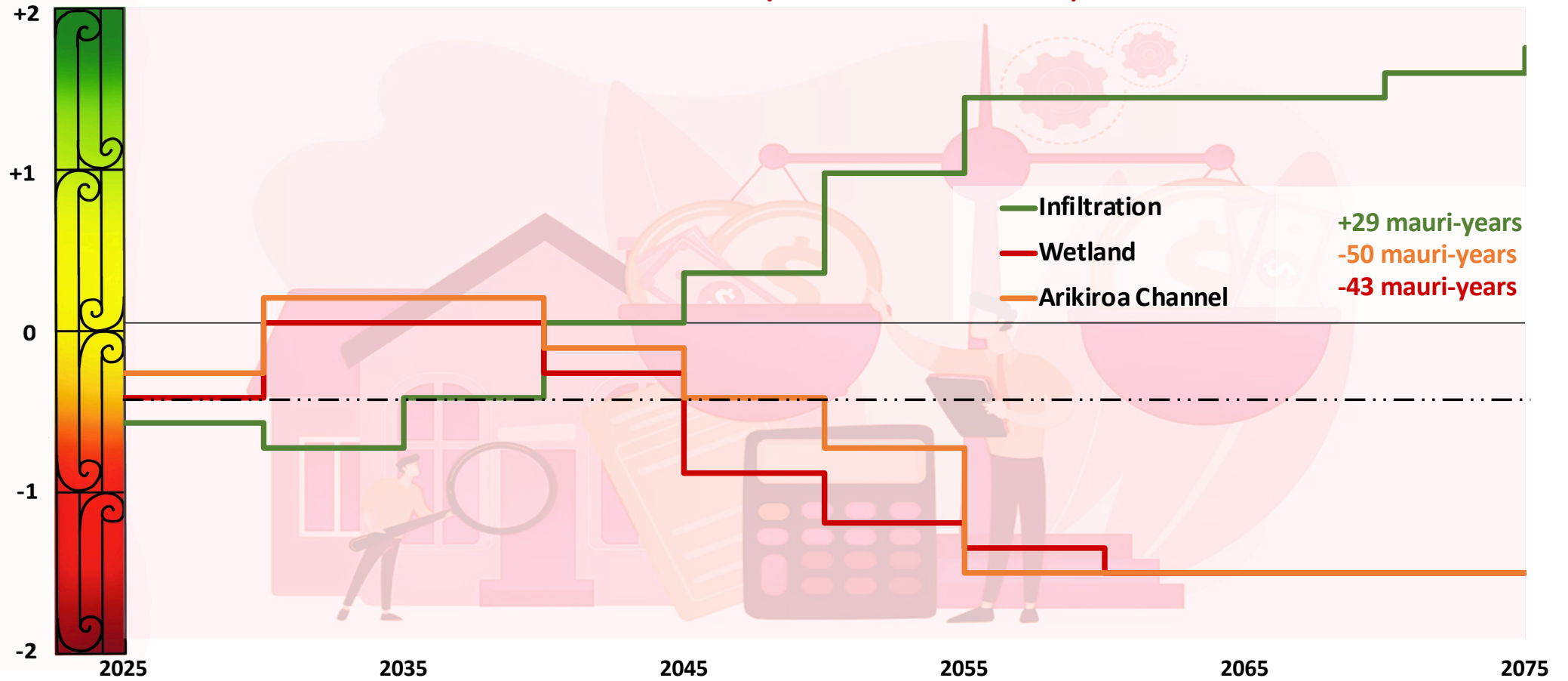
2025 to 2075 - Cumulative Mauri by Scenario



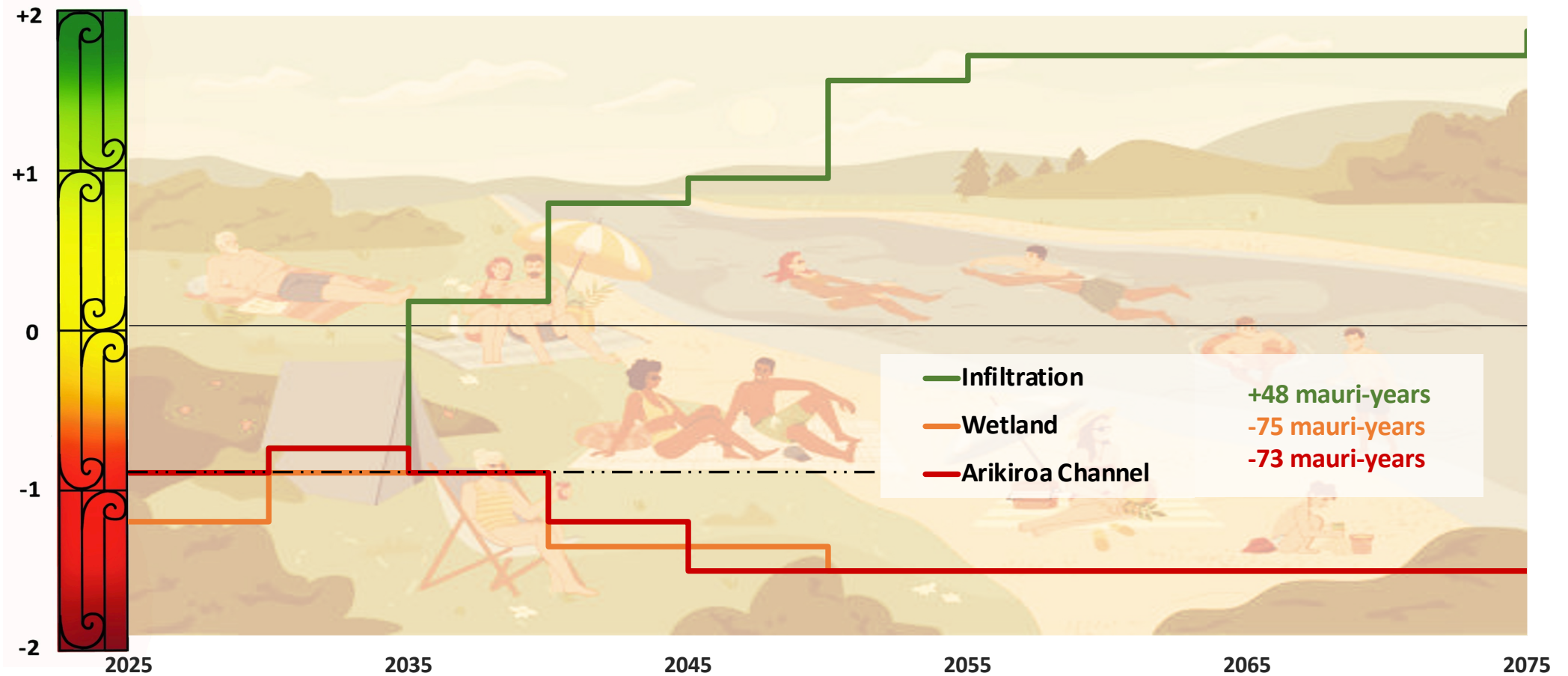
TAIAO (Environmental Dimension)



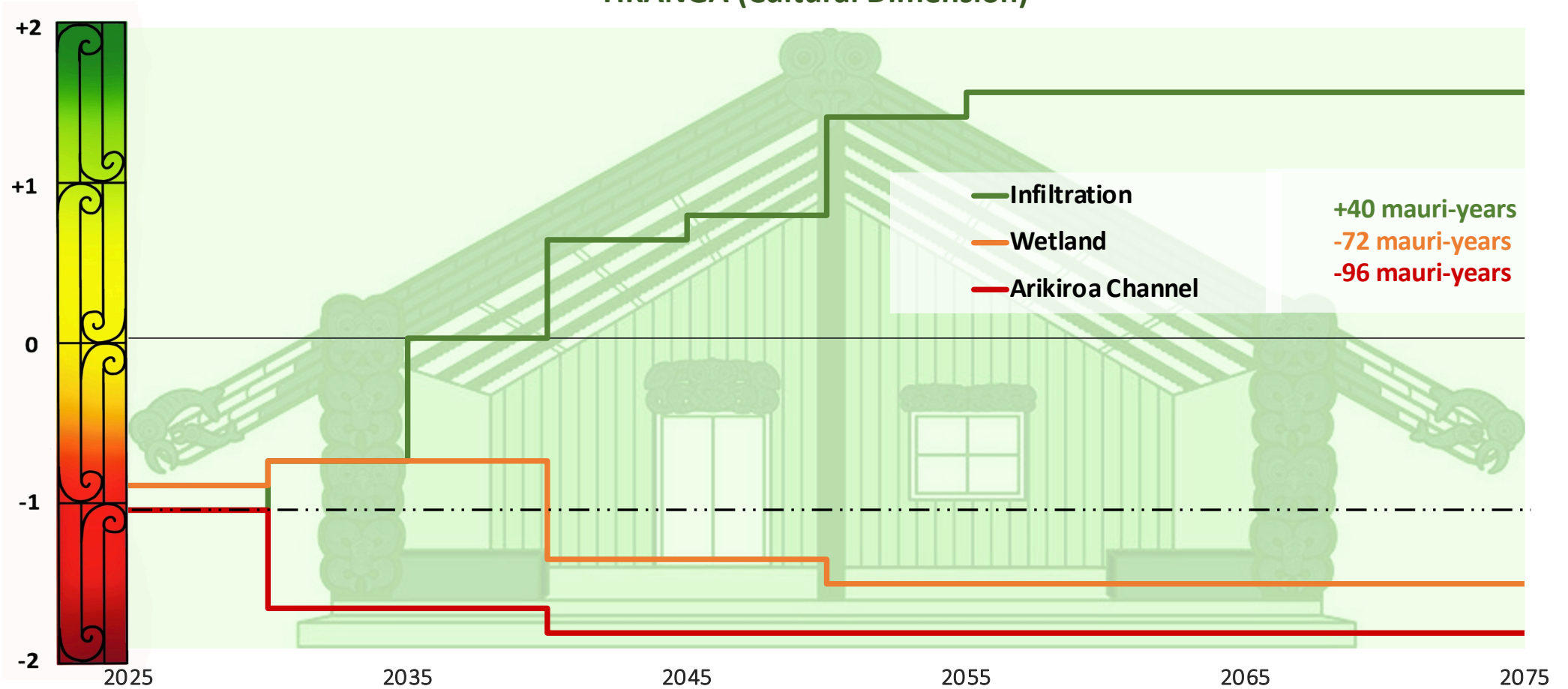
WHAIRAWA (Economic Dimension)



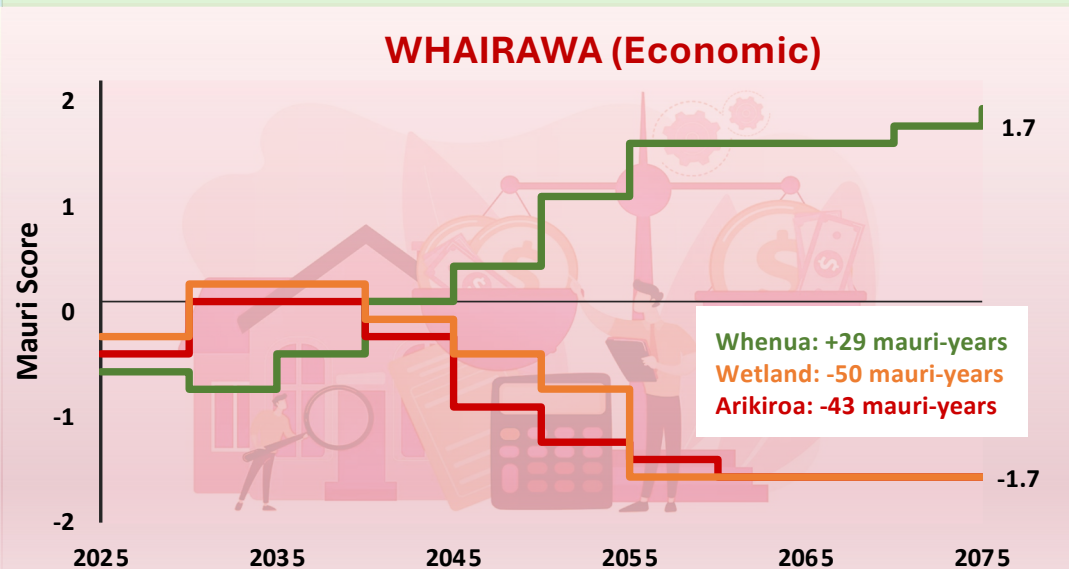
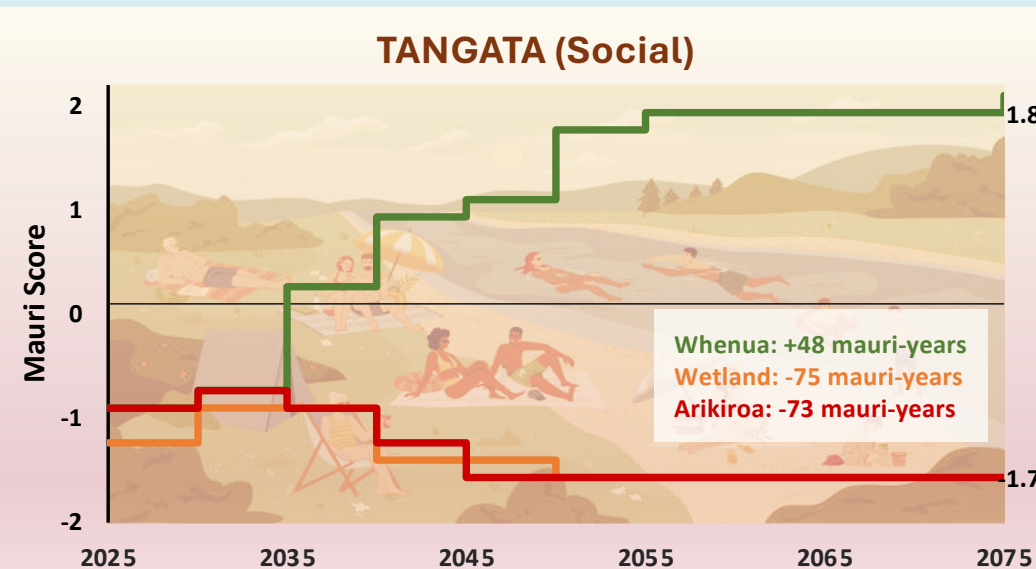
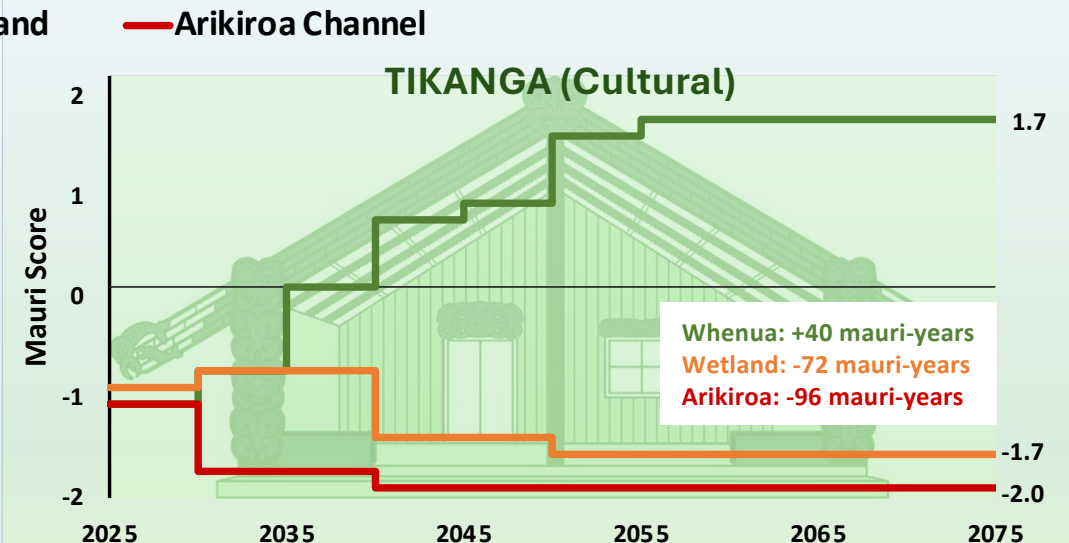
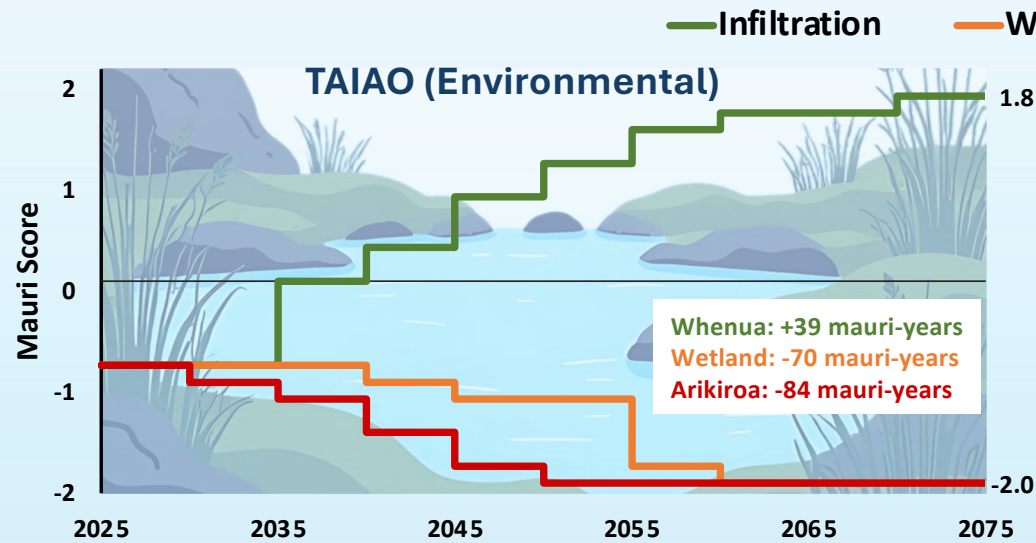
TANGATA (Social Dimension)



TIKANGA (Cultural Dimension)



Mauri Impact Comparison: A 50-Year Outlook for Recovered Water Options



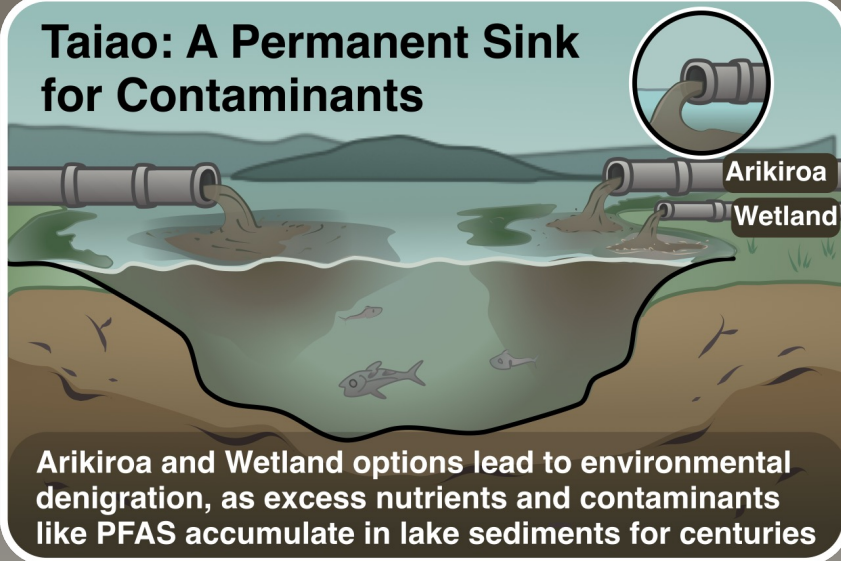
The Mauri of Lake Rotorua

From a Legacy of Harm to a Legacy of Restoration

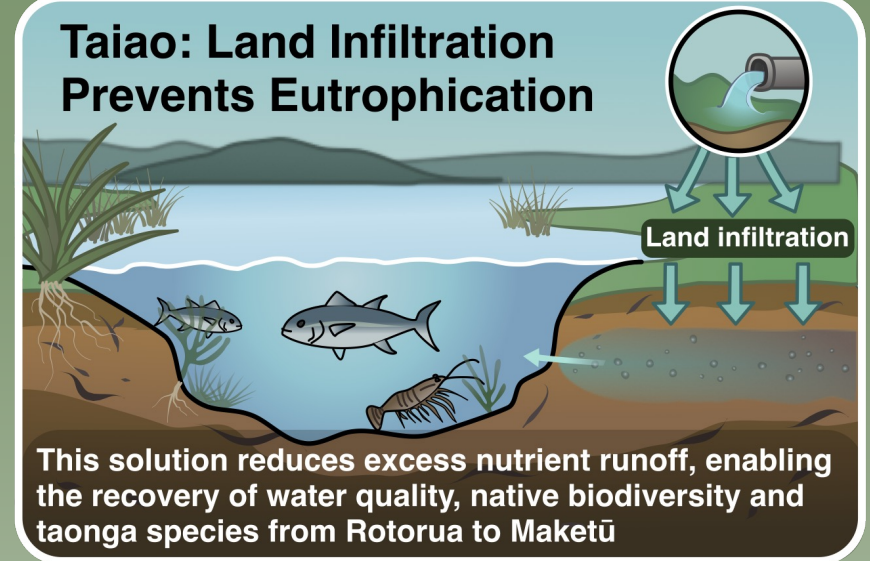
Lake Discharge Options: Arikiroa or Wetland

Land-based Discharge: 200 Ha Infiltration

Taiao: A Permanent Sink for Contaminants



Taiao: Land Infiltration Prevents Eutrophication



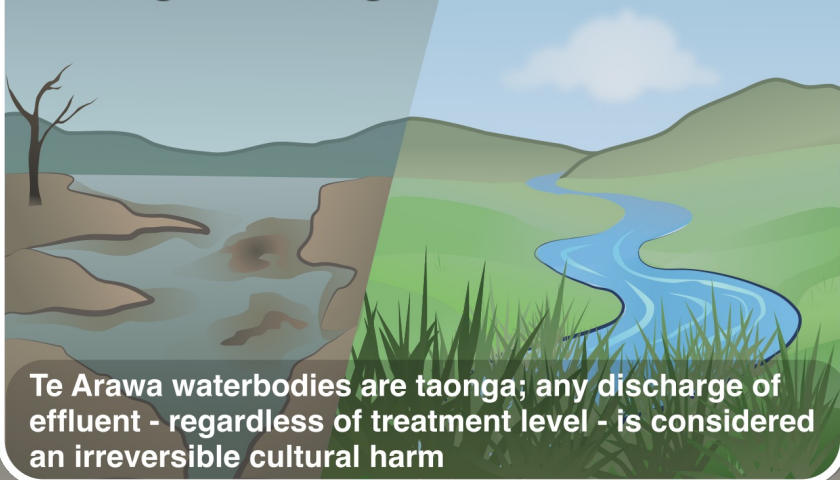
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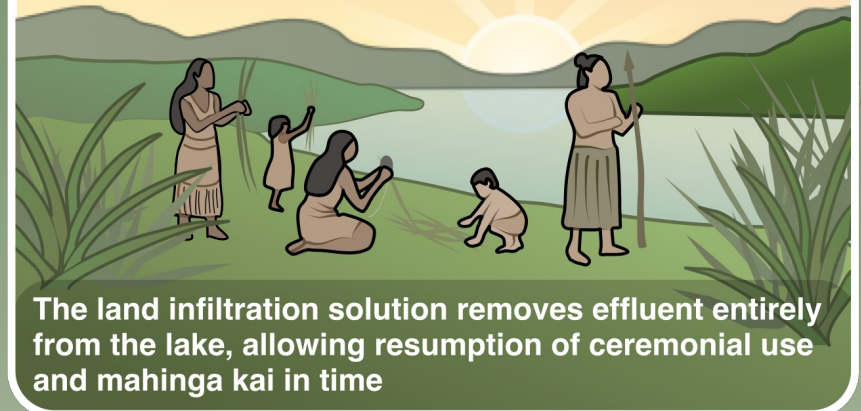
Land-based Discharge: 200 Ha Infiltration

Tikanga: “Taonga, not Toilet”



Te Arawa waterbodies are taonga; any discharge of effluent - regardless of treatment level - is considered an irreversible cultural harm

Tikanga: Restoring Cultural Belonging



The land infiltration solution removes effluent entirely from the lake, allowing resumption of ceremonial use and mahinga kai in time

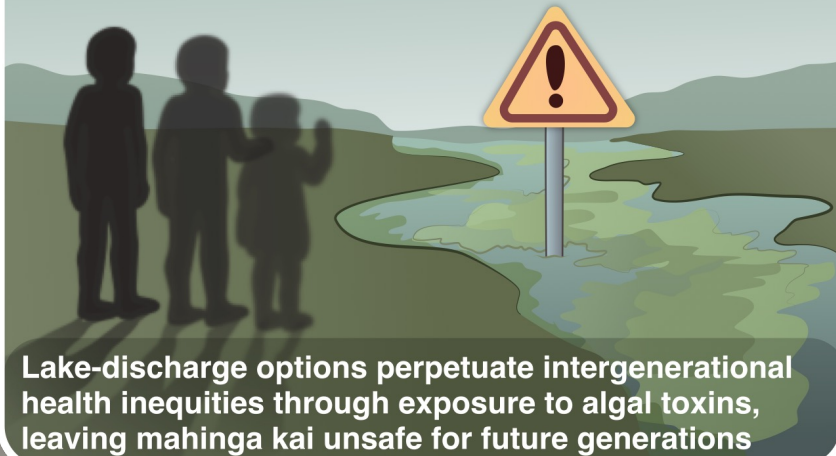
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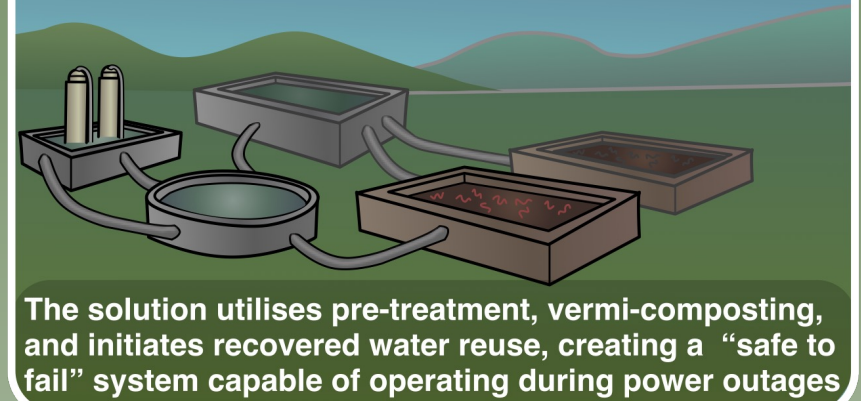
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Tangata: Protecting our Mokopuna



Tangata: Resilience through Decentralisation and Reuse



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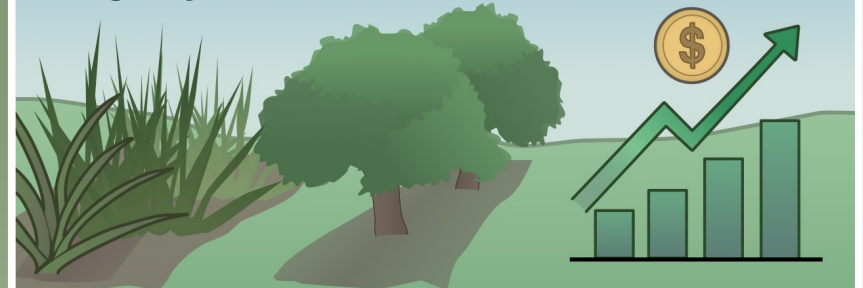
Land-based Discharge: 200 Ha Infiltration

Whairawa: The False Economy of Short-term Savings



While the Arikiroa channel has a lower initial cost and eliminates pumping, future operational costs and mandatory quaternary treatment retrofit results in a negative cumulative return over 100 years

Whairawa: Land Infiltration - A Legacy of Economic Restoration



Revenue from harakeke, manuka, kahikatea, bio-char production and native nursery, reduces land lease costs and creates ongoing employment opportunities

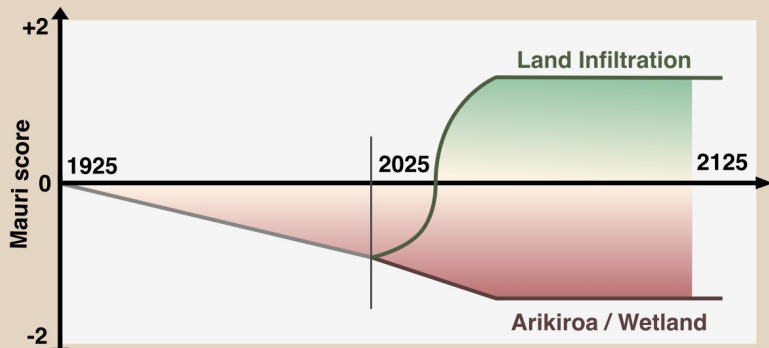
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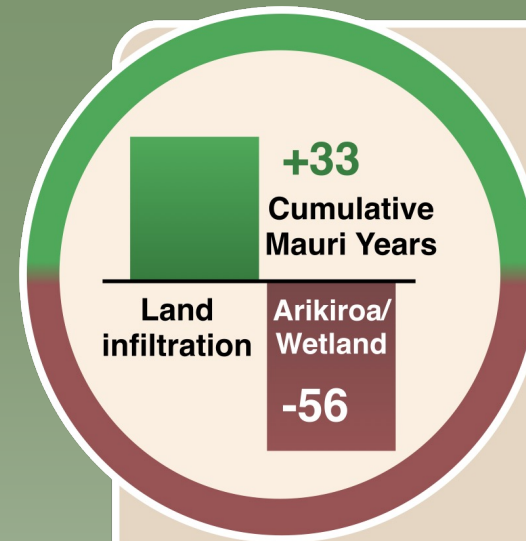
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The Big Picture: Legacy of Cumulative Harm or Cumulative Restoration?



The Land Infiltration Solution outperforms lake-discharge option that increase existing debt



The Big Picture: Land Infiltration Outperforms even on Council Terms

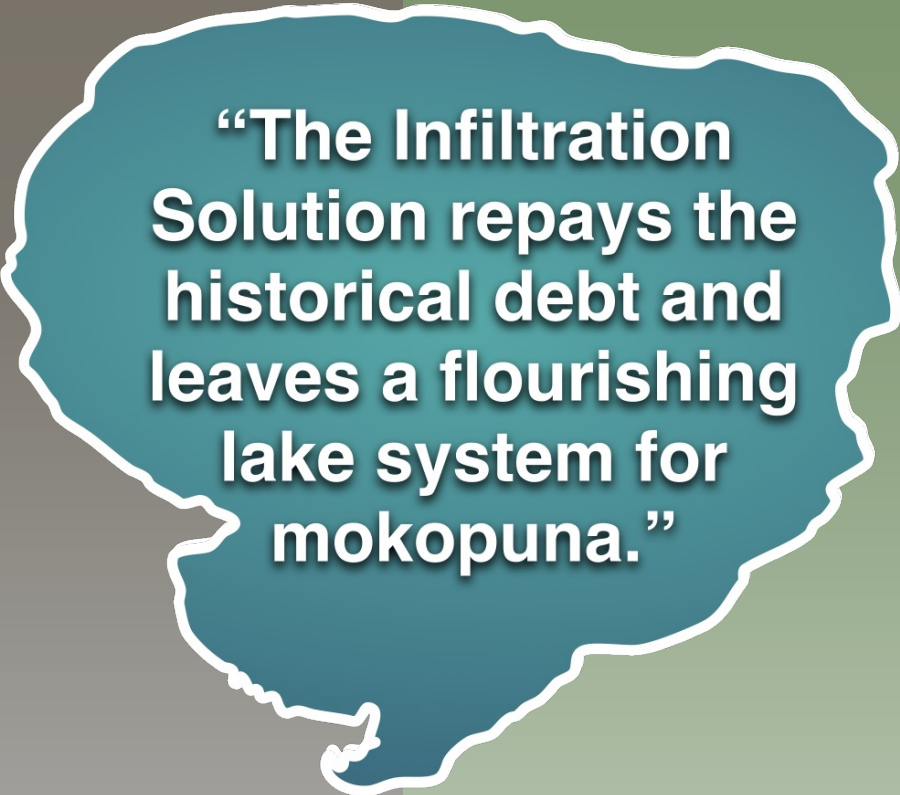
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The Mauri of Lake Rotorua

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“The Infiltration Solution repays the historical debt and leaves a flourishing lake system for mokopuna.”

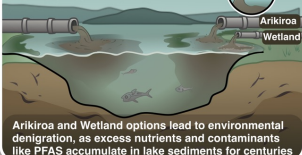
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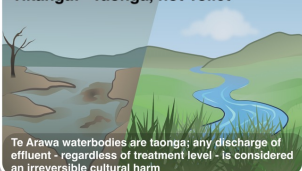
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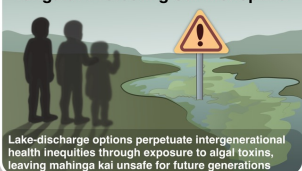
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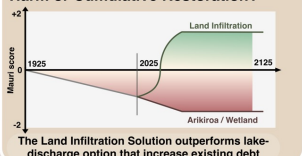
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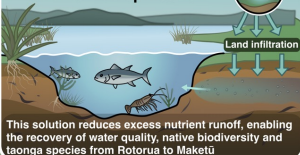
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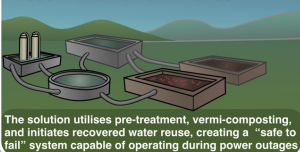
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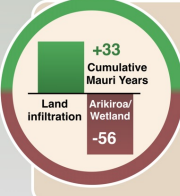
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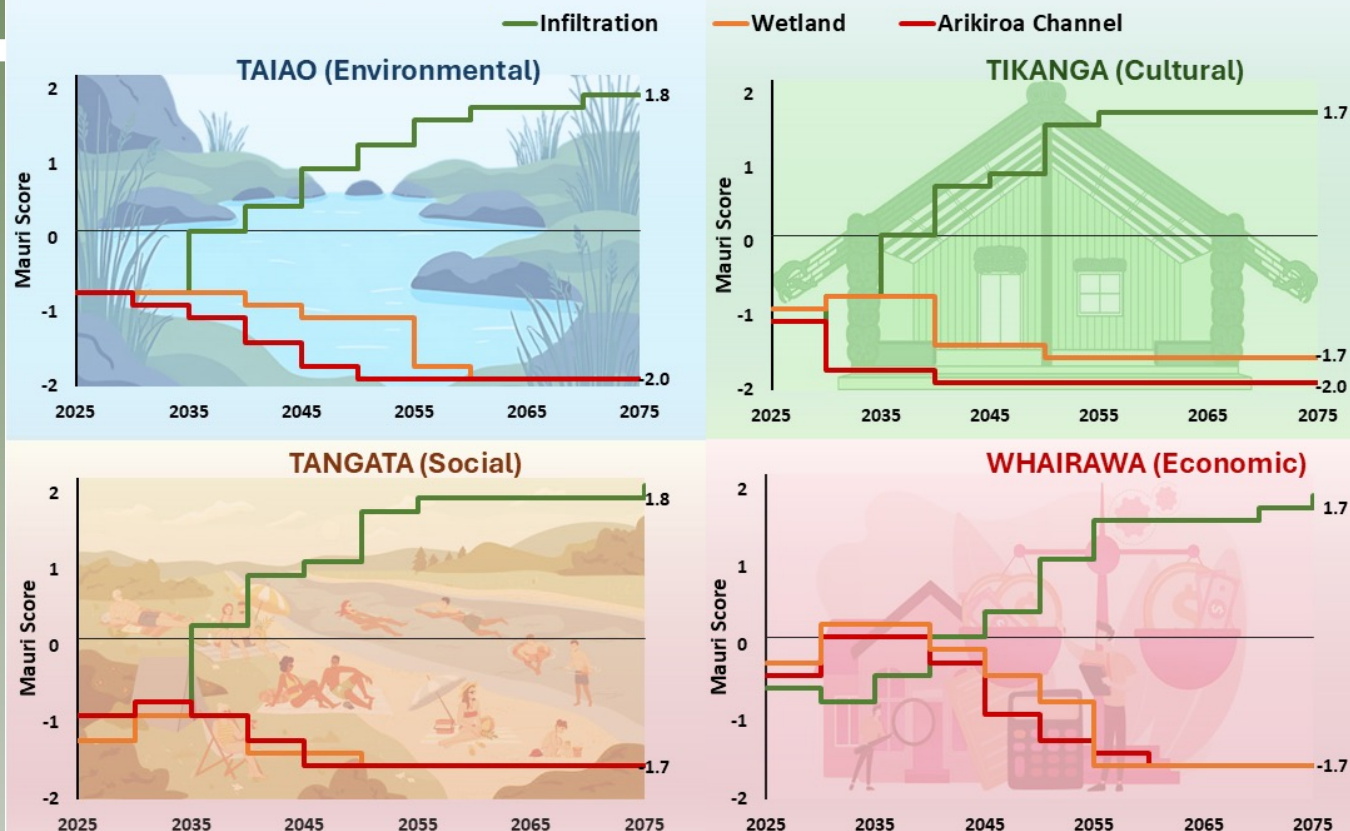
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The Big Picture: Land Infiltration Outperforms even on Council Terms

Even when 70% weighting is given to economics, land infiltration enhances mauri over 50 years, while lake discharge options deplete mauri for future generations.

Mauri Impact Comparison: A 50-Year Outlook for Recovered Water Options



"The Infiltration Solution repays the historical debt and leaves a flourishing lake system for mokopuna."

The choice before Rotorua Lakes Council
is not between different technologies or cost profiles;

it is between two fundamentally different relationships with wai māori.

One choice perpetuates a legacy of infrastructural imperialism.

Another blurs the underpinning infrastructural imperialism.

The Te Arawa alternative builds infrastructure that belongs;

To Te Arawa; to hāpori; to the rohe; and to our generations yet to come.





Te Toa Takitahi Te Ao Māori
2025 ENVI Award Winners

Tēnā Koutou Katoa! Thank You.

