

Advanced SESA: Case Study of eDNA Application in the Solomon Islands



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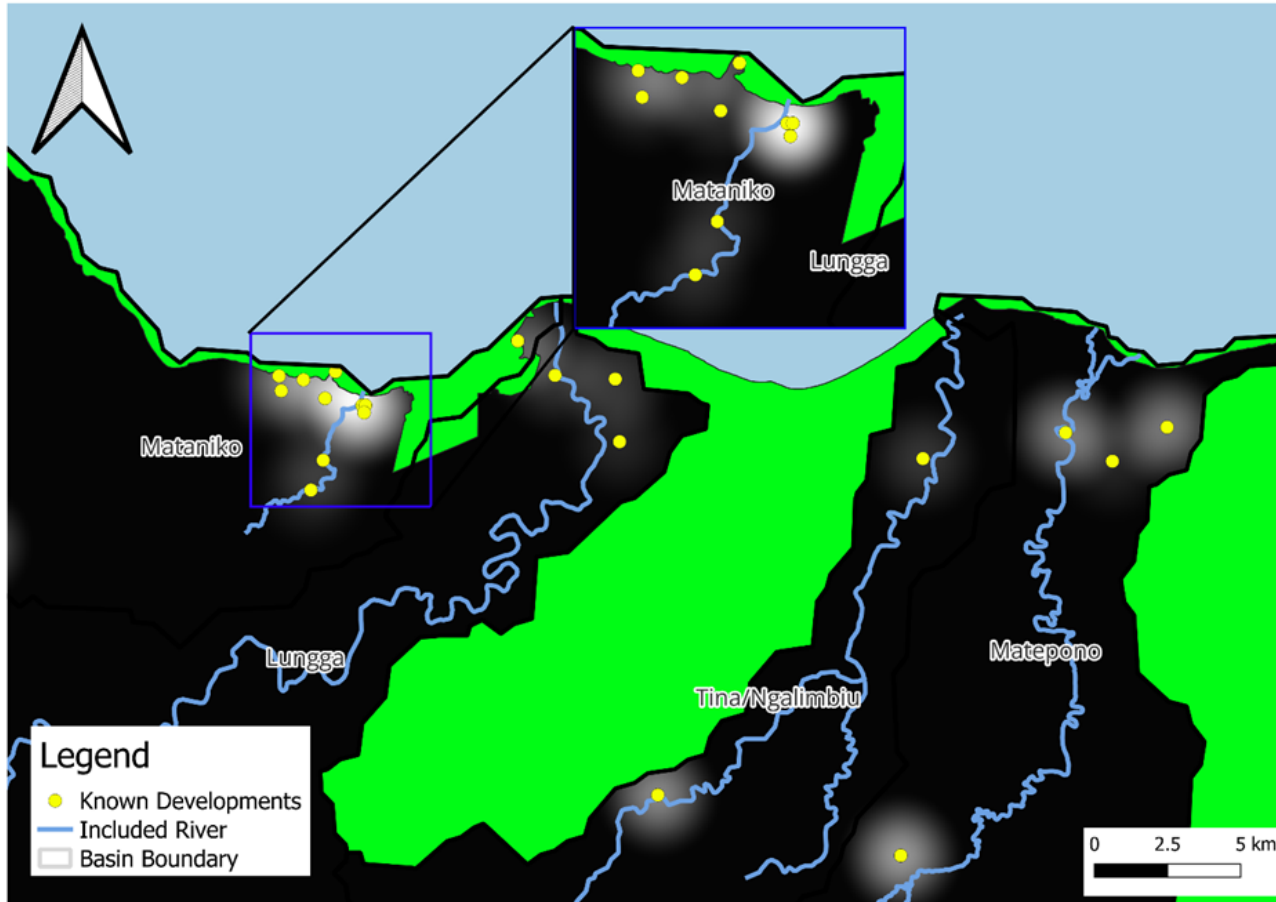




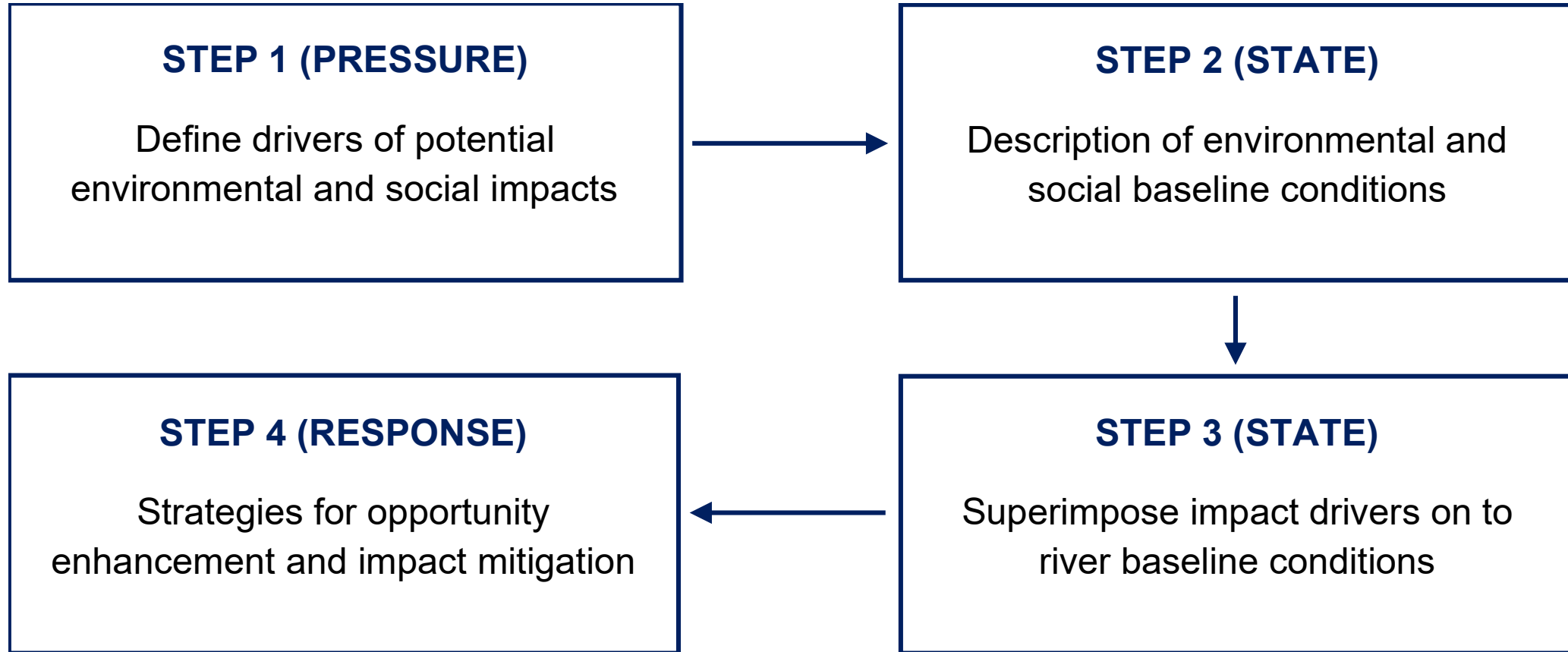
WHAT DO RIVERS SAY WHEN WE FINALLY LEARN TO LISTEN?

Imagine reading a river's diary—not written in words, but in traces of DNA floating in the water. Rivers have long been silent witnesses to the world around them, recording the stories of the land, the weather, and the living beings that interact with them. By studying the genetic fingerprints left behind in the river's flow, we can uncover the hidden narratives that rivers have been quietly preserving.

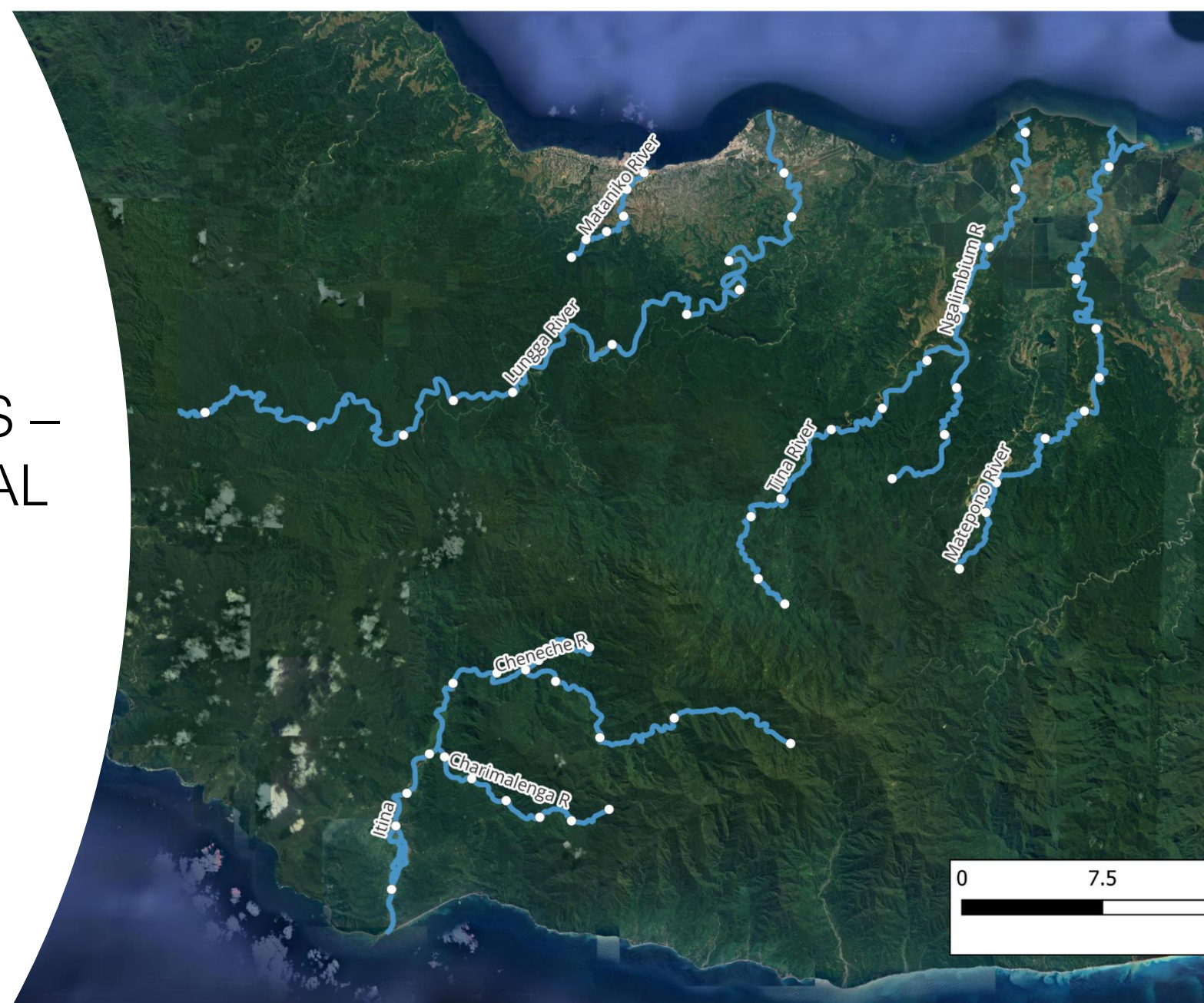
GUADALCANAL'S FRAGILE RIVER LIFELINES



The rivers of Guadalcanal are vital lifelines for the local communities, providing essential resources such as water, food, and sustaining cultural traditions. However, these fragile ecosystems are under growing pressure from various human activities, including logging, plantation expansion, mining, and urban sprawl.



MAP OF SAMPLING SITES – RIVERS OF GUADALCANAL

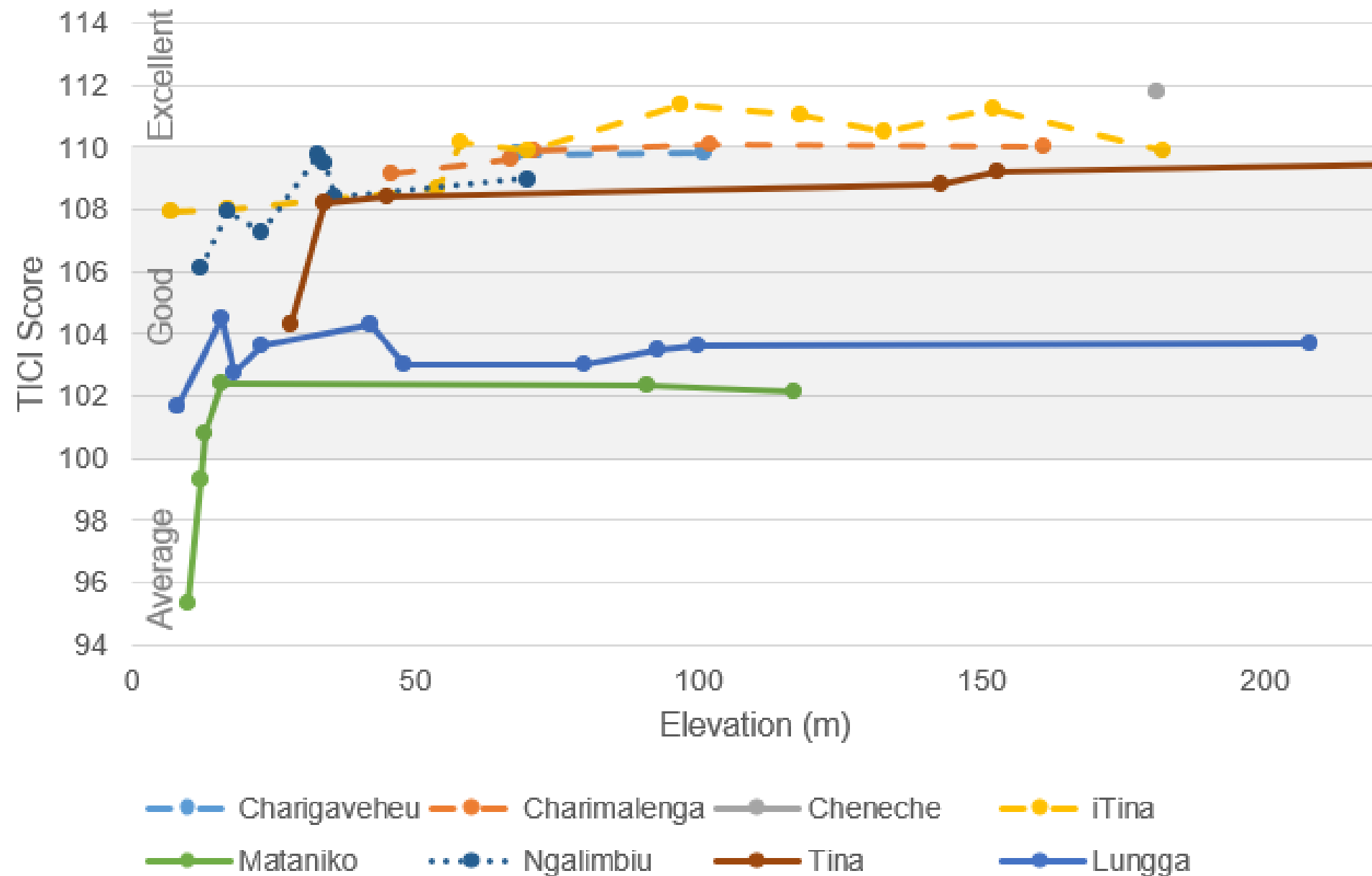




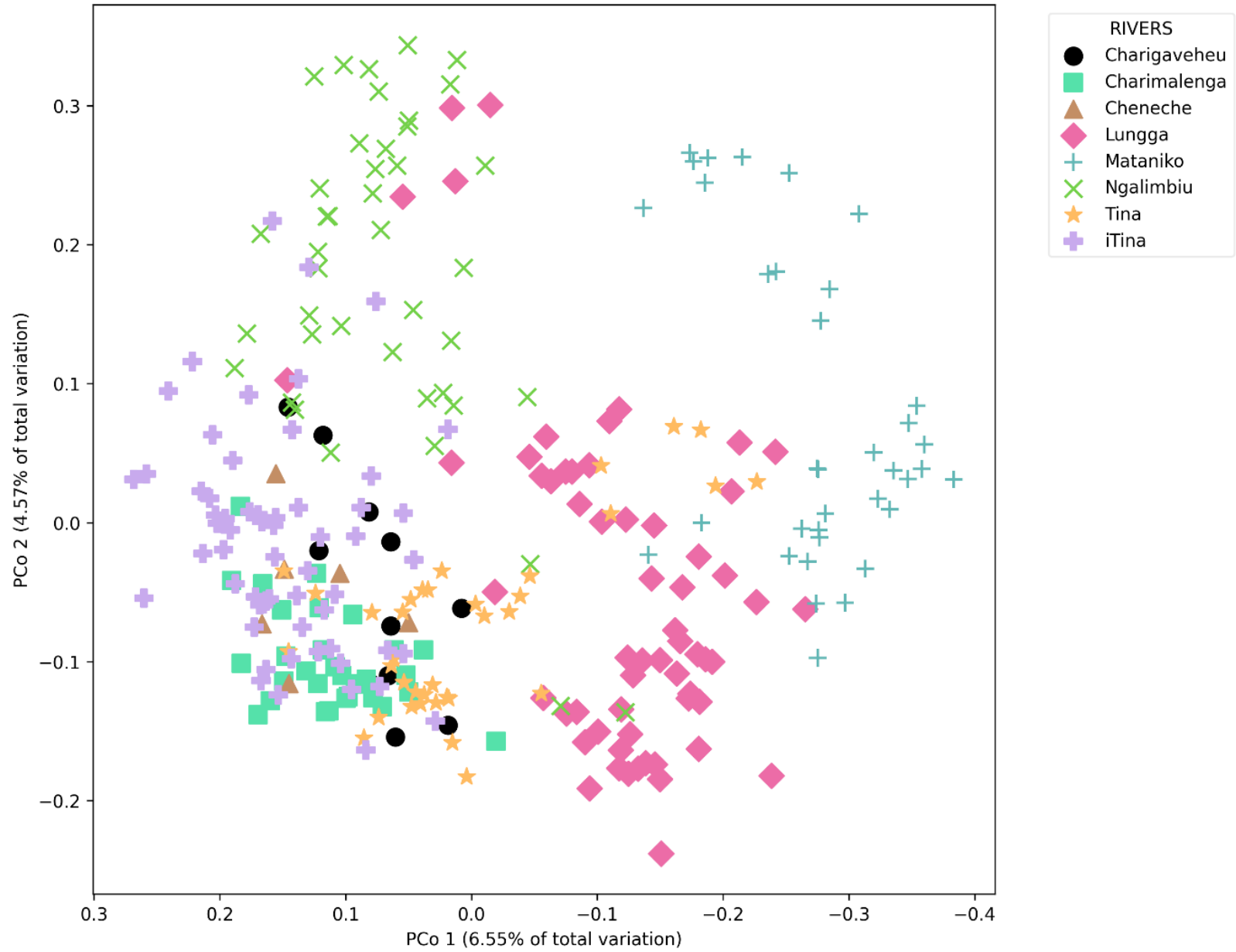
THE GAME CHANGER: eDNA TECHNOLOGY

- Very significant investigation of baseline ecological conditions using eDNA sampling and analysis.
- First time this has been done in Solomons.
- A total of 282 individual samples (including replicates) were taken across 48 sites. 5,861 separate species/genus records obtained.
- Eight Community consultations on the same rivers (100+)
- When combined with secondary research, we now have a good understanding of river quality and social vulnerability for the main rivers of Guadalcanal.

eDNA results - TICI scores



RIVERS: PRINCIPAL COORDINATES ANALYSIS (PCoA) WITH JACCARD DISTANCES



eDNA AS A DECISION- MAKING TOOL



eDNA is not just a tool for scientists—it helps governments know where to conserve, where to restore, and when to say ‘no’ to development.

eDNA sampling serves as a foundational tool within the SESA, providing high-resolution ecological data that informs environmental risk screening, guides scenario development, and supports science-based decision-making for sustainable river basin management.

RECOMMENDATIONS: INFORMING DECISION-MAKING



Logging and urban pressures increasing in Lungga & Mataniko

Enforce logging codes, restrict mining, improve waste, drainage and flood management systems



Protect upper catchment of Tina River from development

Ensure flow and water supply; consider set-aside river for conservation



Ngalimbiu under heavy pressure from mining and plantations

Stop large-scale development and tighten regulation through a moratorium on new extractive permits; review EIA approvals



iTina & Tributaries ecologically intact but vulnerable

Protect through conservation status and sustainable finance.

TOWARD INTEGRATED BASIN MANAGEMENT IN THE SOLOMON ISLANDS

1.Enhanced monitoring approaches

Develop a monitoring regime in collaboration with Solomon Islands Rangers Association, applying eDNA interpretation skills and using remote sensing

2.Increased government capacity

Strengthen government's ability to interpret eDNA data and utilize remote sensing for effective monitoring

3.Conservation fund establishment

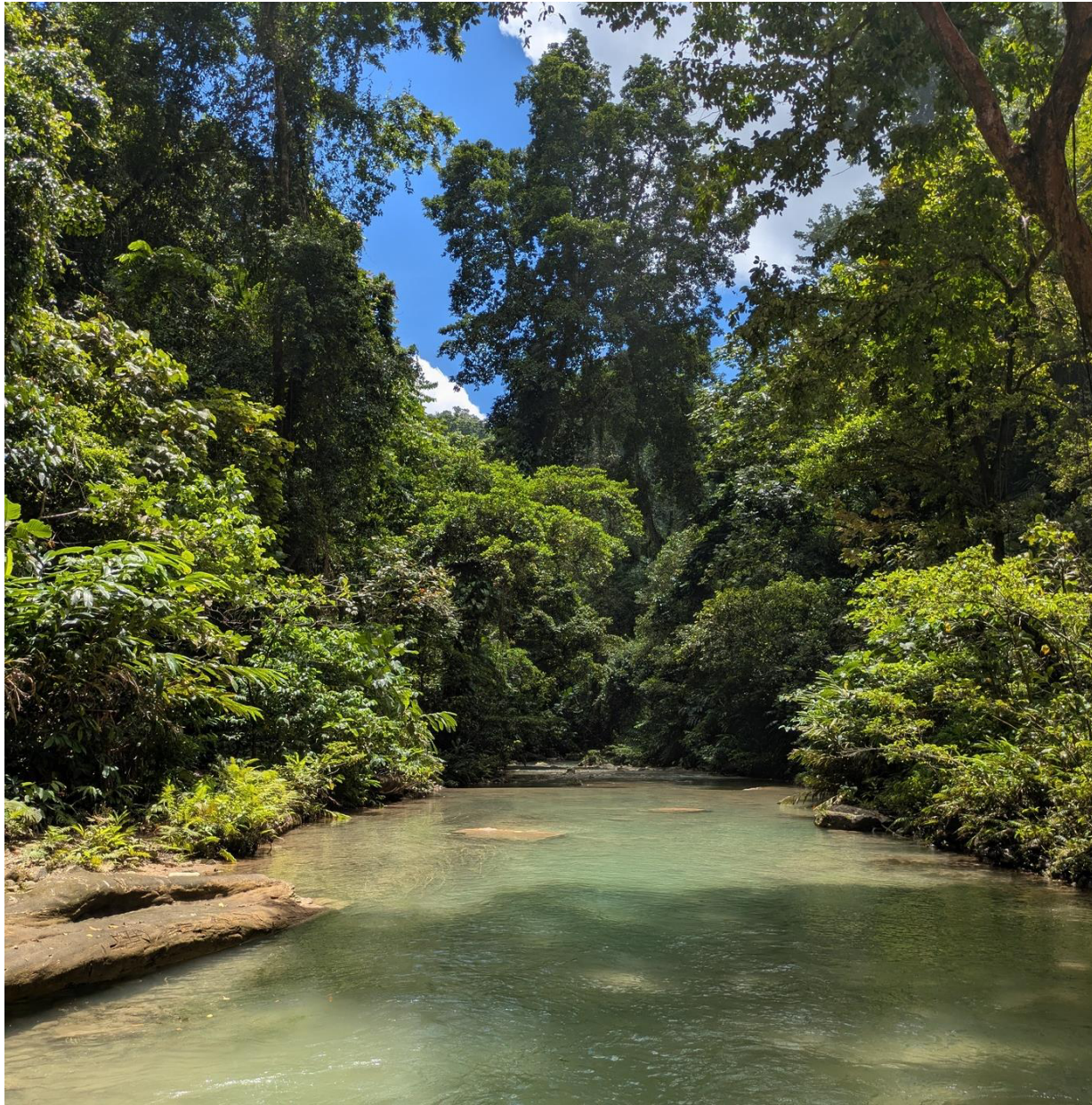
Donors could establish a 'basket fund' to support community-led conservation initiatives, providing a basis for a nationwide Environmental Conservation Fund

4. Community involvement

Effective conservation and remediation efforts require active involvement of tribal owners and riparian communities

5. Water Resources Bill strengthening

Incorporate the concepts of integrated basin management and environmental flows into the Water Resources Bill. Embed basin-level coordination mechanisms and monitoring protocols informed by eDNA



LET THE RIVERS SPEAK

Rivers are living, breathing entities that hold valuable insights into the health of our environment. By closely examining the chemical composition, genetic diversity, and the intricate ecosystems they support, we can uncover the stories these waterways have to tell. This knowledge can guide us towards a more sustainable future, one that harmonizes traditional practices with scientific understanding.



Let's continue the conversation!

Message me your questions or comments in the IAIA25 app.

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