LYNDAX GLOBAL | REAL-WORLD DEPLOYMENT BRIEF

TRACK BRIEF 03: MINA TAWALI — People of the Saltwater & Reefs

Phase 1 Deployment: Woodlark (Murua) Island | Release: 9 August 2026

Complete Track Brief — all 8 challenges

CHALLENGE AT A GLANCE

Objective: Build zero-fossil-fuel marine transit, small-craft conversion kits, reef and mangrove monitoring, sustainable fisheries, reserve patrol, and the maintenance hub that keeps it all running across the Solomon Sea and Woodlark archipelago.

Technical Baseline: Zero fossil fuel propulsion, multi-source power generation, non-lithium storage, revenue-grade telemetry, volcanic-particulate resilience.

Required Deliverables: Vessel or conversion design package, power/telemetry plan, and proof-of-concept evidence in whatever form fits your team's stage.

A note before you read further: everything below is one way to solve this challenge, not the only way. It's meant to show you the shape of the problem clearly enough to work with, not to box you into a single design. Bring your own research, your own expertise, and tell us plainly what extra value your approach adds beyond what's written here — that's genuinely welcome, not a deviation to explain away. This is also a challenge, not the finished deployment: some things that belong to the real, on-the-ground project — like securing consent from customary landowners — aren't yours to demonstrate at this stage, and you won't be asked to. Read the Guidelines for Guardians to Unite alongside this brief for the fuller picture of how deployment actually works, logistics included.

Who can apply: You can apply as a single person, a company, or a team — whatever shape your work actually takes. If more than one submission ends up solving the same piece of this puzzle, we'd rather introduce you to each other than make you compete: this is about uniting the right people around Ava, not picking a lone winner.

1. SYSTEM PLACEMENT & ROLE

Where This Sits: The sensing and living body of the sea. Connects Woodlark Island to outer atolls, the Louisiade Archipelago, and mainland Alotau across a roughly 24,000 km² marine estate in the Solomon Sea — the Murua zone staging out of Woodlark, the Louisiade zone centered near Misima, and the Bwanabwana atolls linking out to Alotau.

Core Mission: Deploy zero-fossil-fuel solar-kinetic catamarans, small-craft conversion kits, submerged reef and mangrove telemetry, sustainable fisheries infrastructure, reserve patrol systems, and local maintenance and training hubs across the district — without imported fossil fuel or fabricating vessels on Woodlark itself.

Integration Rule: Every vessel, conversion kit, and submerged pod embeds revenue-grade meters executing hardware-locked edge hashing, streaming telemetry through Mina Kula's tactical mesh and satellite backhaul to the central dual-node dashboard.

2. WOODLARK ISLAND: WHAT YOU'RE ACTUALLY DESIGNING FOR

A real starting point, not the whole picture — go do your own deeper research from here. Facts below are sourced from public geographic and climate records; anything marked as an estimate is exactly that.

Geography. Woodlark Island is roughly 60km east-west and 30km north-south at its center, in the Solomon Sea, part of Milne Bay Province, centered around 9.13°S, 152.81°E. Highest point is Mount Kabat at 240m. The island's own name is Muyuw, also called Murua.

Population & settlements. No formal census has been taken since 1990; an unofficial estimate puts the island's population around 6,000 today, spread thin. Kulumadau is the largest settlement, Guasopa second — Guasopa also holds the island's health centre, currently 9 health workers covering roughly 6,000 people across Woodlark and the surrounding islands. There is one primary school, in Kulumadau; every child leaves for Alotau to attend secondary school.

Climate. Warm and humid year-round, roughly 21–34°C. Wet season runs January through March, peaking in March. Southeast trade winds dominate the drier stretch, roughly May through November. Cyclone and tropical storm risk concentrates December through March.

Access. The route in runs through Alotau, Milne Bay Province's capital, then by sea to Woodlark — roughly 155–160 nautical miles by straight-line estimate; no verified figure exists for actual sea-route distance or travel time, so treat this as a rough planning estimate, not a fixed number.

3. THE TECHNICAL BASELINE

These fall into two tiers. A small number are hard constraints, marked [HARD CONSTRAINT] below — they protect physical safety or the project's core environmental commitments, not architecture, and admit no exceptions. Everything else here is the reference bar for meeting each field challenge, not the only acceptable answer: if your team has a genuinely better way to solve the same problem, propose it. This challenge is evaluated on what actually works in the field, not on matching this document line for line.

- **Intake-Less Closed-Loop Skin Thermal Management**: Vessels operating in pumice-dense volcanic waters route propulsion, battery, and auxiliary system cooling through sealed structural micro-channels built into the hull skin itself, dissipating heat passively into the surrounding ocean. No raw seawater is drawn into the vessel, eliminating impeller damage and clogged heat exchangers from floating pumice — this is the reference approach, not the only way to solve pumice-fouling; propose a better one if you've got it.
- **Sacrificial Waterline Abrasion Boundary**: Forward bows and active waterlines carry a flush-mounted, field-replaceable abrasion track absorbing impact from floating volcanic pumice rafts, swappable during operational stops without dry-docking.
- **Zero Fossil Fuel Propulsion** — **[HARD CONSTRAINT]**: No diesel or petrol engines anywhere in the fleet, including the small craft this replaces — the high-emission two-stroke outboards currently used for inter-island transit and patrol.
- **Multi-Source Power Generation**: Propulsion and auxiliary systems draw from more than one independent generation source — solar deck skins, hydro-kinetic hull turbines, and/or rainwater catchment micro-turbines are the reference stack — so no single weather condition leaves a vessel without power.
- **Non-Flammable Energy Storage** — **[HARD CONSTRAINT]**: Sodium-ion or flow-battery (VRFB) chemistry only. No lithium enters the fleet, including solid-state variants that are still lithium-based — the same fire-safety baseline as every other track.
- **Revenue-Grade DC Bus-Bar Telemetry**: Digital meter modules embedded directly on primary DC distribution bus-bars and charging regulators, measuring exact kWh generation and compressing data with hardware-locked signatures and UTC timestamps before satellite transmission.

- **Local Revenue Kept Separate From the Carbon Loop**: Physical local revenue — passenger fares, cargo tariffs — is tracked separately from carbon-verification data and reinvested in local operations and maintenance. Specific split terms are set out in individual engagement agreements, not fixed in this brief.
- **Working With Customary Land**: Free, Prior and Informed Consent with the registered customary landowners is led by Lyndax Global and the Samarai-Murua District Development Authority, as a real, ongoing relationship — it isn't something your submission needs to demonstrate or secure yourself, and you won't be asked to. Vessel routes, patrol patterns, and monitoring sites should be designed to respect traditional marine tenure, not assume unrestricted access.
- **Field Durability, Anti-Theft & Ease of Use** — **[HARD CONSTRAINT]**: Anything deployed unattended in the field is built to survive years without regular maintenance, resist tampering or theft, and stay simple enough not to fail from ordinary misuse — this district is genuinely isolated, and a fragile or easily-defeated unit doesn't help anyone. This is about the real outcome (long unattended service life, tamper resistance, hard to get wrong), not a specific named spec like ‘military grade’: propose whatever achieves that outcome.

4. THE EIGHT SUB-CHALLENGES — ONE BACKBONE

3.1

Volcanic-Hardened Tri-Source Catamarans & Maritime Transit Insetting

THE FIELD CHALLENGE

Inter-island transit and eco-ranger patrols around Woodlark currently rely on high-emission petrol "banana boats" that pollute marine reserves and burn expensive fossil fuel. Floating volcanic pumice rafts and marine debris shred standard outboard impellers and clog raw seawater cooling intakes, leaving patrol teams stranded mid-transit. Solar-electric catamarans at this general scale are already a real, commercially built category, not speculative technology — the diagram below includes general market ranges (solar capacity, battery storage, cruise speed) for context on what's already achievable.

REFERENCE STANDARDS

- Closed-loop skin cooling and sacrificial abrasion track, per the universal baseline — this is proven marine engineering (keel cooling has been standard on commercial vessels since the 1940s), not experimental
- Multi-source power generation feeding non-lithium storage — solar and hydro-kinetic generation are both established; a dedicated stand-alone hydro-kinetic turbine specifically is the newer piece of this stack, so validate it or propose a better-proven alternative if you've got one
- Embedded revenue-grade DC meters enabling verified Maritime Transit Insetting (Asset Class 5, under CPA 2 / CDM AMS-III.C, transitioning to VM0059) as fossil outboards are displaced

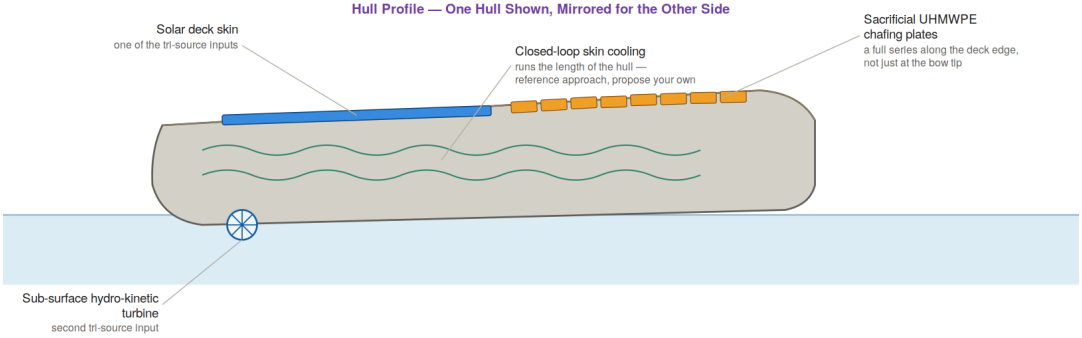
WHO SHOULD APPLY

Naval architects, marine propulsion engineers, composite fabrication specialists.

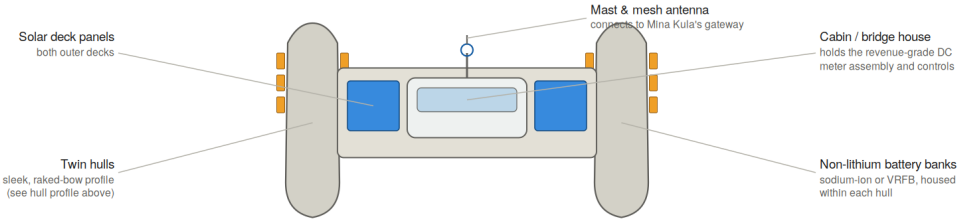
The Tri-Source Catamaran

Illustrative guideline only — one way to build this, not the only way

Hull Profile — One Hull Shown, Mirrored for the Other Side



Twin-Hull Configuration — Viewed From Above



Third tri-source input: rainwater catchment micro-turbines (sited on the upper deck, not pictured).

Zero fossil fuel propulsion anywhere in the fleet.

What's Already Being Built — Real-World Calibration

General market ranges for solar-electric catamarans at comparable scale — for context, not a fixed target

Hull Size	Solar Capacity	Battery Storage	Cruise Speed
Small (≈35–40 ft)	≈8–9 kWp	≈100–140 kWh	≈8 knots
Mid (≈45–50 ft)	≈3–9 kWp	≈70–140 kWh	≈10–18 knots
Large (≈55–65 ft)	≈15–18 kWp	≈280–560 kWh	≈10–14 knots

Solar-electric catamarans at this scale are already a real, commercially built category — these ranges are what's already been achieved, not a locked target. Closed-loop hull cooling is likewise proven marine engineering (in use commercially since the 1940s), not experimental — the dedicated hydro-kinetic turbine is the newer piece here, worth validating or proposing an alternative for.

3.2

Small-Craft Solar-Kinetic Retrofit Kits

THE FIELD CHALLENGE

The actual daily heartbeat of inter-island and atoll travel runs on thousands of privately owned small boats, powered by carbon-heavy, expensive two-stroke petrol outboards — not the big catamarans. Converting the fleet that already exists matters as much as building a new one.

REFERENCE STANDARDS

- A modular, open-access electrification kit combining a durable solar canopy attachment and an efficient electric long-tail or pod drive
- Sized for standard local watercraft, for shorter atoll-to-atoll journeys rather than the catamaran's longer transit routes

WHO SHOULD APPLY

EV conversion mechanics, retrofitting engineers, marine electrical technicians, low-power propulsion designers.

3.3

Submerged Reef Sentinel Pods & AUV Robotics

THE FIELD CHALLENGE

Alluvial gold mining siltation, distant-water overfishing, and pelagic pumice smothering threaten Guasopa Bay's living reef. Continuous underwater monitoring in salt water destroys standard consumer electronics within a season.

REFERENCE STANDARDS

- Fixed, low-maintenance submerged units carrying optical cameras and LiDAR payloads
- Autonomous surface vehicles (ASVs) and underwater robotics (AUVs) for coral cover and fish stock telemetry, reporting via the tactical mesh and satellite backhaul

WHO SHOULD APPLY

Marine roboticists, underwater optical engineers, marine biologists, blue-carbon specialists.

3.4

Bio-Composite Non-Timber Canoes

THE FIELD CHALLENGE

Traditional canoe building — a vital cultural practice — currently requires felling old-growth rainforest trees, putting conservation goals in direct conflict with native heritage.

REFERENCE STANDARDS

- Preserve traditional clan canoe hull designs using bio-composite, recycled-material, or geopolymer-compatible construction
- Eliminate tree-felling completely while preserving traditional sailing physics and navigation aesthetics

WHO SHOULD APPLY

Naval architects, composite fabrication engineers, master traditional canoe builders.

3.5

Mangrove & Blue Carbon Restoration Systems

THE FIELD CHALLENGE

Coastal mangroves and seagrass beds are degrading from siltation and unregulated fishing, threatening the blue-carbon credit pipeline this whole programme depends on.

REFERENCE STANDARDS

- Nursery, planting, and acoustic monitoring systems for mangrove and blue-carbon restoration
- Must satisfy Verra VM0033 (Tidal Wetland and Seagrass Restoration) methodology requirements

WHO SHOULD APPLY

Mangrove restoration specialists, marine ecologists, blue-carbon methodology experts.

3.6

Sustainable Fisheries, Aquaculture & Off-Grid Cold Storage

THE FIELD CHALLENGE

Zoning reefs for conservation without providing alternative protein sources breeds local resentment or simply shifts fishing pressure elsewhere. And a smaller, sustainable catch still needs to actually reach people before it spoils — right now, it often doesn't.

REFERENCE STANDARDS

- Off-grid, atoll-appropriate aquaculture and sustainable catch systems that provide community food security without competing with protected reef zones
- Off-grid freezer or cold-storage capability for fishermen, so a sustainable catch goes further and doesn't spoil before it reaches anyone — real food security and livelihood value without needing a bigger catch

WHO SHOULD APPLY

Aquaculture engineers, fisheries scientists, marine food-security technologists, off-grid refrigeration engineers.

3.7

Eco-Ranger Marine Custody & Patrol Systems

THE FIELD CHALLENGE

The marine reserve faces real pressure from illegal fishing and unauthorised petrol craft entering protected zones. Right now there's no zero-emission way for local eco-rangers to patrol, monitor, and report it.

REFERENCE STANDARDS

- Zero-emission ranger patrol vessels, built to the same propulsion and hardening baseline as everything else in this track
- Geofenced monitoring that reports intrusion signatures back to Mina Kula's ledger — this is about visibility and reporting, not armed interception

WHO SHOULD APPLY

Systems engineers, maritime logistics experts, geofencing software developers, marine patrol vessel designers.

3.8

Vessel Maintenance & Training Hub

THE FIELD CHALLENGE

Vessels are built at applicants' own shipyards, not fabricated on Woodlark — but a damaged hull 20km from anywhere cannot wait for a shipyard visit, and high-tech vessels fail within years if no one local can service them. The district needs a real repair and training facility, not a factory.

REFERENCE STANDARDS

- Working maintenance yard at Guasopa and Bwagoia capable of servicing (not constructing) skin-cooled solar-kinetic catamarans and small-craft retrofit kits — hull repair, thermal system servicing, abrasion-track replacement
- A genuine training pathway into paid local maintenance and technician roles, not a facility staffed entirely from outside

WHO SHOULD APPLY

Marine maintenance engineers, naval architects with field-service experience, vocational trainers.

5. WHAT TO SUBMIT

Teams applying to Mina Tawali upload to lyndax.org:

- **Naval Engineering or Conversion Package** — hull CAD, CFD thermal cooling analysis, structural abrasion-track schematics, or electrical retrofitting diagrams — whichever fits your challenge.
- **Power & Telemetry Plan** — how generation components capture energy and how edge meters package data for mesh uplink.

- **Proof-of-Concept Evidence** — in whatever form best reflects where your team actually is — a working prototype, a bench-tested subsystem, evidence of a prior deployment, or a detailed feasibility case with supporting calculations. A polished video is welcome but not required.
- **Rough Cost Estimate** — an order-of-magnitude budget for the specific challenge(s) you're addressing — not a binding quote. Early-stage teams can give a range; further-along teams can be more precise. This helps us plan against something real instead of guessing.

6. HOW THIS IS EVALUATED

Submissions are scored on three equal pillars:

- **Technical Integrity** — Does it meet the technical baseline — either as written, or with a genuinely better alternative?
- **Integration Readiness** — Does it plug cleanly into the rest of the build?
- **Guardian Spirit** — Was this built with real reverence for the saltwater, the reefs, and the clans who skipper these waves — not just to satisfy the spec sheet?

7. INTELLECTUAL PROPERTY

Any technology or intellectual property you bring into this challenge remains yours. What gets built specifically for this project is licensed to Lyndax Global and the Samarai-Murua District Development Authority for use here — not assigned, not sold, not owned by us. If your technology's use ever expands beyond this initial deployment, those terms will be set out clearly in your individual contract once you're selected — never assumed from this brief.

Questions or more detail before you submit? Reach Mina Tawali directly at tawali@lyndax.org.

This is a first-of-its-kind deployment, and this brief is a challenge document, not the final build — specifications are a starting point for direct engagement with applicant teams, not a fixed spec to execute silently. Full disclaimers and engagement terms are set out in the Guidelines for Guardians to Unite and the Eligibility & Disclaimers document. Submissions close 11 September 2026, 6:00pm Singapore time.