LYNDAX GLOBAL | REAL-WORLD DEPLOYMENT BRIEF

TRACK BRIEF 02: MINA VALU — People of the Land & Soil Ancestry

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

Complete Track Brief — all 9 challenges

CHALLENGE AT A GLANCE

Objective: Design off-grid, cement-free, regenerative living infrastructure for logging-scarred island land — housing, power, and water that a scattered village can actually run.

Technical Baseline: Geopolymer 3D-printing (no imported cement), a two-part totem system (forest sentinel + village power/water unit), non-lithium storage.

Required Deliverables: Design package, material approach, energy/water concept, telemetry integration 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 living body of the land. Carries the physical infrastructure — housing, water, power, food, health, education, sanitation, and waste-to-energy.

Core Mission: Design off-grid 3D-printed housing, the two totem types that power and monitor the district, atmospheric water generation, clean cooking, and e-health/e-learning pods across Woodlark Island — without imported cement and without touching standing primary forest.

Integration Rule: Microgrid meters, water-generation sensors, and clinic/school telemetry all stream through Mina Kula's tactical mesh to the central dashboard. Verification itself is Mina Kula's job — Valu generates and feeds the data, it doesn't run a second ledger.

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

A small number of things here are genuinely non-negotiable, marked [HARD CONSTRAINT] — both are things your design fully controls, not permissions someone else has to grant. Everything else is the reference bar for meeting the challenge, not the only acceptable answer: if you've got a genuinely better way to solve the same problem, bring it. This is evaluated on what would actually work on Woodlark, not on matching this document line for line.

- **Cement-Free Construction** — **[HARD CONSTRAINT]**: No imported Portland cement, anywhere. Structural 3D printing and foundations use local, recycled material — dredged river silt or volcanic sand as the binder — instead.
- **Non-Flammable Energy Storage** — **[HARD CONSTRAINT]**: Sodium-ion or flow-battery (VRFB) chemistry only. No lithium anywhere in the microgrid — the same fire-safety baseline as every other track.
- **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. What we're actually looking for is a design that can adapt to what that process determines: flexible siting, modular scale, the ability to move or resize if a specific location changes. Design for that reality, not around a permission you don't have standing to obtain.
- **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 NINE SUB-CHALLENGES — ONE BACKBONE

2.1

Cement-Free Housing & the Lifestyle Dividend Block

THE FIELD CHALLENGE

Standard construction out here relies on imported Portland cement, which is expensive and slow to ship at any real scale, and works against the project's whole carbon logic. The challenge: 3D-print cyclone-resilient,

comfortable homes directly on already-scarred land, without imported cement.

REFERENCE STANDARDS

- A geopolymer mix using recycled glass, dredged river silt, or local volcanic ash as the binder, in whatever ratio you can justify
- Delivered under the Lifestyle Dividend Block: customary landowners hold permanent, non-revocable occupancy rights to the home itself
- Built to withstand severe tropical cyclones

WHO SHOULD APPLY

3D printing specialists, structural/materials engineers, geopolymer architects.

2.2

The Forest Sentinel Totem

THE FIELD CHALLENGE

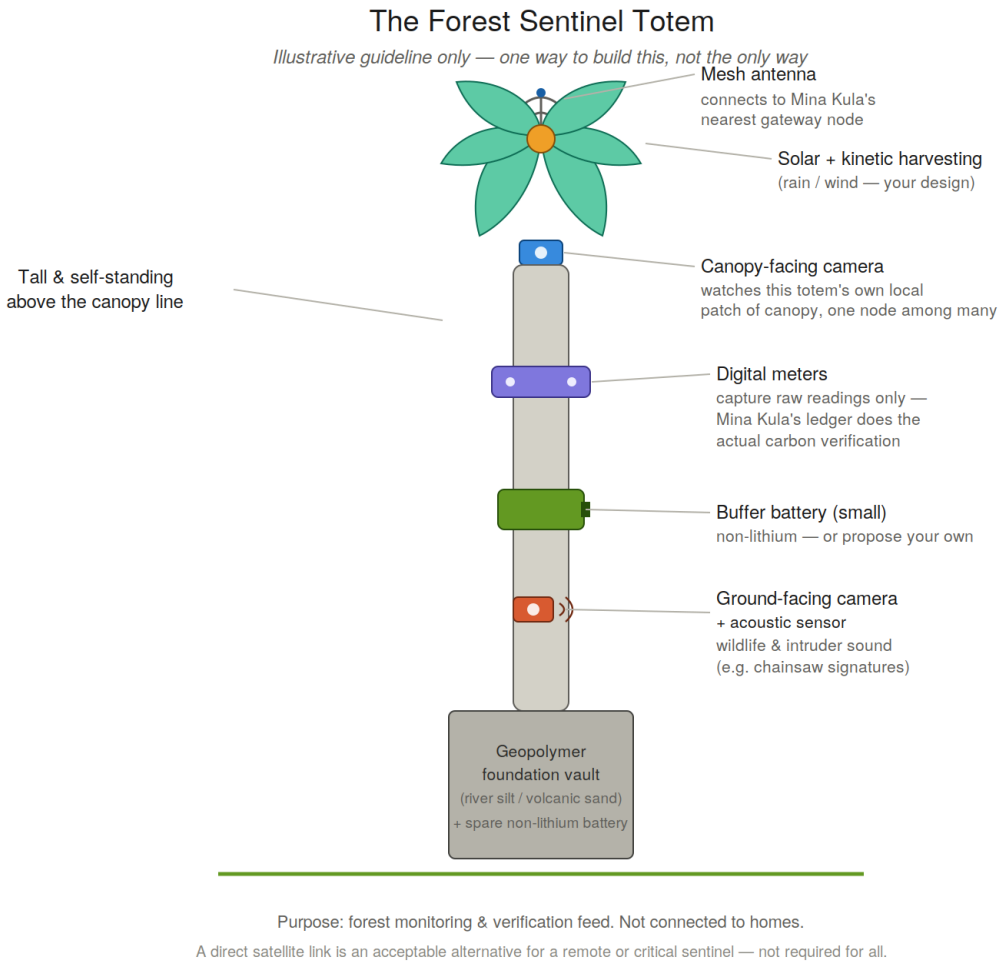
Isolated hamlets across Woodlark have no grid power and no way to monitor what's happening in the forest around them. The challenge: a tall, self-powered totem that stands above the canopy, watches over its own patch of forest, and never needs anyone to visit and recharge it. A district-wide picture comes from many of these working together, sector by sector — not from any single totem seeing everything.

REFERENCE STANDARDS

- Tall and structurally stable enough to stand alone above the canopy line, printed from the same cement-free material as the housing
- Self-powered — solar panels plus some form of kinetic harvesting (rain, wind, whatever your design makes work) feeding a small non-lithium buffer battery, with a spare non-lithium battery held in the foundation vault; propose your own storage layout if you've got a better one
- Two distinct sensor packages, not one: a canopy-facing camera watching this totem's own local patch of forest, and a separate ground-facing camera plus acoustic sensor picking up wildlife and intruder sound — chainsaw signatures included
- Connects to Mina Kula's nearest gateway over the tactical mesh, which carries the actual satellite link — a direct satellite terminal on the totem itself is a reasonable alternative for an especially remote or critical sentinel, not a requirement for every one
- Digital meters capture raw readings only; Mina Kula's ledger is where that data actually becomes verified carbon accounting

WHO SHOULD APPLY

Renewable energy specialists, structural engineers, sensor-fusion designers.



2.3

The Village Totem & Home Microgrid

THE FIELD CHALLENGE

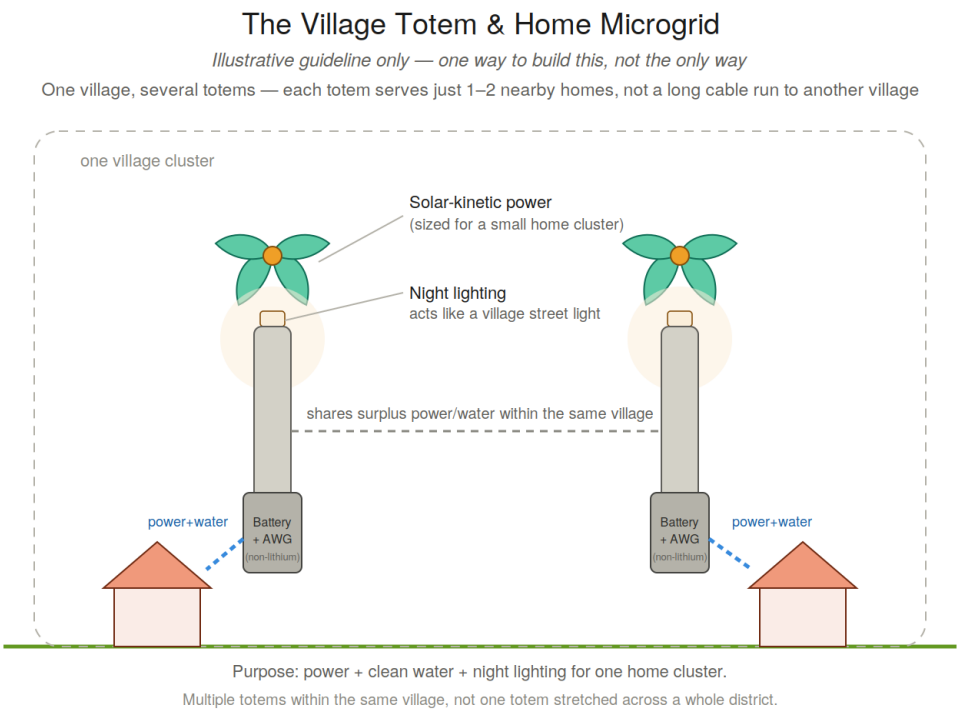
A single family's home still needs power and clean water even without a grid reaching it. The challenge: a shorter totem — doesn't need forest-canopy height — that brings both to just one or two nearby homes. A village genuinely has several of these, not one totem stretched across the whole cluster, since homes and villages here sit too far apart to run cable between them.

REFERENCE STANDARDS

- Non-lithium battery, atmospheric water generation, and solar-kinetic power sized for one or two homes, not a whole forest sentinel — propose your own design if you've got a better one
- Doubles as village lighting at night, the way a street light would — a small, genuinely useful extra given the totem's already generating and storing power after dark
- Designed to share surplus power or water with neighbouring totems within the same village — not across the distance to another village — the exact linking method is yours to propose
- Every totem streams its own generation and water data into Mina Kula's ledger in real time

WHO SHOULD APPLY

Microgrid engineers, power electronics designers, water systems engineers.



2.4

Closed-Loop Pyrolysis & Clean Household Energy

THE FIELD CHALLENGE

Households currently cook over open firewood, which drives local deforestation and serious respiratory illness, while coconut husk and cacao waste get burned for lack of anything better to do with them.

REFERENCE STANDARDS

- A pyrolysis or gasifier unit turning organic waste, crop residue, and husks into biochar and clean cooking gas
- Zero primary or protected forest biomass in the feedstock, ever

WHO SHOULD APPLY

Pyrolysis/gasification engineers, clean-cooking technologists, waste-to-energy developers.

2.5

Coconut & Cacao Circular Economy Hub

THE FIELD CHALLENGE

Coconut husk gets burned as waste, and raw cacao has no local processing, so farmers export raw beans for a fraction of what they're actually worth.

REFERENCE STANDARDS

- A processing hub combining copra handling and cacao fermentation, feeding waste directly into the pyrolysis loop rather than being burned separately

WHO SHOULD APPLY

Agritech engineers, food-processing equipment specialists, circular economy developers.

2.6

Cyclone-Resilient Controlled Agrofarming

THE FIELD CHALLENGE

Cyclones and volcanic ashfall periodically wipe out subsistence crops, leaving communities dependent on emergency supply until the next harvest comes in.

REFERENCE STANDARDS

- Off-grid, solar-powered hydroponic or controlled-environment growing modules built to survive cyclone damage and ashfall
- Water and nutrient use metered and linked back to Mina Kula's telemetry

WHO SHOULD APPLY

Agritech engineers, controlled-environment agriculture specialists.

2.7

Off-Grid AI-Triaged E-Medical & E-Learning Pods

THE FIELD CHALLENGE

Remote islanders currently have no real access to primary healthcare or secondary education.

REFERENCE STANDARDS

- Off-grid, solar-powered, satellite-linked clinic and learning pods attached to housing clusters
- Diagnostic data sent, with consent, to partner medical and educational networks via the Sinabada Hub

WHO SHOULD APPLY

Medtech engineers, telehealth platform developers, edtech specialists.

2.8

Closed-Loop Sanitation & Off-Grid Water Systems

THE FIELD CHALLENGE

No sanitation infrastructure means polluted groundwater, and the outer atolls are too dry for atmospheric water generation to work well on its own.

REFERENCE STANDARDS

- Composting toilets or plasma sanitation treating waste on-site, converting it into syngas and inert biochar
- A hybrid water approach — atmospheric generation where humidity allows, small-scale desalination or rainwater harvesting where it doesn't

WHO SHOULD APPLY

Sanitation engineers, water treatment specialists, desalination engineers.

2.9

Vocational Training & Maker-Space Hub

THE FIELD CHALLENGE

High-tech infrastructure fails within a few years if nobody local is trained to fix it.

REFERENCE STANDARDS

- A fab-lab and training curriculum turning clan members into paid eco-rangers, printer operators, and utility technicians
- A real handover path — not a facility permanently staffed from outside

WHO SHOULD APPLY

Vocational education designers, fab-lab specialists, technical trainers.

5. WHAT TO SUBMIT

Teams applying to Mina Valu upload to lyndax.org:

- **Design Package** — your structural approach, material mix reasoning, and energy/water concept — CAD/BIM if you have it, clear sketches and calculations if you don't yet.
- **Telemetry Handoff Notes** — how your microgrid, water generation, or pyrolysis metrics would interface with Mina Kula's tactical mesh.
- **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 it designed for the clans, not just 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 Valu directly at valu@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.