CHAPTER 02:

Technology and Innovation for Mangrove Conservation

The Role of Technology in GMT's Strategy

Since its founding, GMT has recognized that technology will revolutionize global forest conservation. By enhancing accuracy in monitoring change in the field, by increasing transparency in financial flows to drive climate outputs, and by empowering communities to take the lead in local land use decisions, technology in central to realizing GMT's mission, both in the field as well as in service to global communities of practice.

Overcoming Challenges

GMT's technology journey faced early hurdles, as we faced the high costs and resistance to blockchain adoption. Recognizing these challenges, GMT refined its approach to focus on tools with immediate on-ground relevance, such as geospatial mapping and smart patrol systems. This shift ensured technology remained a practical enabler rather than a barrier.

"Technology has been a game-changer in our ability to monitor mangrove ecosystems and assess the impacts of community interventions. We constantly seek new tech to improve our abilities to serve communities and to leverage their insights and local knowledge in real-time planning and real-world climate action."

- Matteo De Besi,
GMT Senior Advisor

Empowering Communities Through Technology

GMT integrates technology with local capacity building, ensuring tools are accessible and practical. By training communities to use mapping, smart patrols, and monitoring tech, GMT fosters ownership and accountability. And by out-scaling open source solutions for project analysis - like Forest Scan -, GMT builds bridges to connect ecological potentials with improvements in local livelihoods across the global tropics.

Key Technological Innovations

01

Monitoring and Restoration Tools

GMT employs ultra high-resolution, tasked satellite imagery and machine learning engines by Kumi Analytics to monitor mangrove health and identify restoration zones under the OxCarbon Standard. With support from UBS Climate Collective, GMT is pioneering open source tools like ForestScan to empower local stakeholders to quickly map and analyze mangrove ecosystems to lower start-up costs of project implementation.

02

Efficiency and Precision

Advanced satellite mapping has enabled GMT to develop a targeted “patching” strategy, identifying degraded zones and restoring them efficiently at <1m resolutions. GMT’s tech-based approach to regeneration reduces costs, accelerates reforestation, and ensures local resources are maximized in generating long term impacts.

03

Smart Patrols and Data Reporting

In 2024, GMT began adapting KoboToolbox-based reporting tools for project reporting and real time interdictions in local conservation patrols. By empowering conservation patrol teams, we seek bridging technology to link near-real time field data with material advances in participatory governance and localized policy change.

"ForestScan aspires to revolutionize early-stage blue carbon development by making environmental insights accessible to all at ultra low cost. By leveraging open data and machine learning, we empower communities to drive informed conservation efforts from the ground up."

- Malak G Grioui,
GMT Solutions Analyst

"With ForestScan, we're breaking down barriers to entry for blue carbon projects. By providing critical deforestation and land classification data, we enable local stakeholders to make science-backed decisions that ensure long-term impact and sustainability."

- Nouhaila Eddlimi,
Solutions Analyst

Looking Ahead

GMT's future technological priorities include remote sensing forest alerts to the first mile, AI-powered analytics, cost-effective carbon verification solutions, and solar-powered drones for enhanced monitoring. Each innovation will be evaluated for its potential to deliver real, sustainable impact while aligning with GMT's community-first philosophy.

"Mangroves serve as Green Shields and Green Lungs. These forests represent one of Earth's most incredible natural technologies for arresting global warming. By interlinking mangrove forests with scalable tools for governance, management, and equitable benefit sharing, GMT's serves as a catalyst for positive, global change."

- Dr. Ryan Merrill,
GMT Executive Secretary