FOREST GOVERNANCE WITHOUT A CENTRAL GOVERNMENT

A SUBNATIONAL MONITORING AND RESPONSE MODEL FROM THE ETHNIC TERRITORIES OF MYANMAR

By **Forest Trends**

EXECUTIVE SUMMARY

Myanmar's political crisis has dismantled central oversight of natural resources, but new evidence from a forest monitoring initiative shows that subnational authorities in the country's ethnic territories can still monitor forests, enforce environmental rules, and adapt policy responses. The project, utilizing remote sensing, has uncovered a surprising reality: small-scale gold mining, not illegal logging, has emerged as a primary driver of deforestation. From September 2024 to April 2025, Forest Trends and the exiled National Unity Government's (NUG) Ministry of Natural Resources and Environmental Conservation (MONREC) monitored 1.06 million hectares of protected forests across five townships in the Sagaing and Magway regions and responded to the findings in areas tagged by 55,340 deforestation alerts and 209 ground-truthed hotspots.

The findings challenge conventional assumptions about deforestation and natural resource management in Myanmar:

1. **Deforestation drivers have been shifting:** The monitoring teams found that mining activities accounted for 30 percent of verified forest loss, far exceeding expectations. Smallholder subsistence agriculture represented 68 percent of remotely sensed deforestation hotspots, but field visits discovered the newly cultivated areas had already been deforested by previous activities.[1] Many farmers clearing land were internally displaced persons (IDPs) fleeing conflict, highlighting the complex humanitarian dimensions of environmental pressures during political crisis. The monitoring teams also found that charcoal production accounted for only two percent of deforestation cases and illegal logging accounted for just one deforestation case. This revealed a critical blind spot in Myanmar's forest management approach, which had historically focused enforcement on timber extraction rather than extractive industries.

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[1] Land use change was picked up with the clearing of vegetation, but ground-truthing revealed no evidence of tree cutting. It is likely that the clearing of ground vegetation registered as a deforestation hotspot. Global Forest Watch reports that this is a common issue.

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2. **Forest monitoring, community engagement, and enforcement remain possible even in fragile governance contexts:** Trained local forest officers used Global Forest Watch (GFW) satellite tools to detect threats in real time, leading to concrete results: two mining operations penalized and shut down, one illegal timber operation halted, and multiple community warnings issued. The new mining discoveries triggered immediate policy response, such as specialized training for NUG MONREC staff on mining environmental and health impacts, and new inter-ministerial coordination on mining regulation and enforcement. When deforestation was linked IDPs, enforcement approaches were recalibrated: community meetings and awareness campaigns addressed the issue within the crisis context, demonstrating the interdependence of forest protection and humanitarian needs, while discouraging further expansion into intact forests.

Environmental governance during conflict is often perceived as a luxury to address only after peace is achieved. However, this type of locally driven process is home grown and highly relevant both to Myanmar's current reality—where no centralized land management exists in most areas—and to any future peace scenario. It lays the groundwork for equitable state–central government arrangements on resource governance and benefit sharing, helping to address one of the root causes of the conflict.

This pilot offers a replicable model for environmental governance in crisis zones in other regions of Myanmar (and possibly worldwide), proving that satellite monitoring paired with local field teams and local leadership can rebuild public trust, inform evidence-based policy, and protect critical ecosystems even during political instability.

1. MINING EMERGES AS A PRIMARY THREAT

When the project began in June 2024, the assumption was illegal logging would be the dominant driver of forest loss in Myanmar's protected areas. The Myanmar Timber Enterprise (MTE) had centered most of its forest production in the Sagaing Region in the past. Decades of timber extraction, combined with weakened governance following the 2021 military coup, seemed to point toward a logging crisis.

Ground truthing the remotely-sensed deforestation data told a different story.

Of the 209 investigated deforestation alerts across 629 hectares (Table 1), mining (primarily small-scale gold extraction) emerged as the largest direct driver of deforestation, concentrated heavily in Sagaing Region's townships of Banmauk (Table 2). This finding was particularly striking given that only one illegal logging operation was documented during the entire monitoring period.

For the first time in this pilot region, geo-referenced, field-verified data confirmed what had been anecdotal reports: mining operations have proliferated rapidly since the political crisis began. As Myanmar's economy destabilized and businesses took advantage of the governance gap, opportunists turned to gold extraction as a more stable and valuable commodity. The spatial analysis revealed the geographical extent of these new operations.

This discovery carries profound implications. The mining environmental footprint extends beyond tree cover loss, as it also includes mercury and other chemical contamination of waterways, soil degradation, and long-term ecosystem damage that isfar more difficult to reverse than selective logging. The finding revealed a critical blind spot in Myanmar's forest management approach, which had historically focused enforcement on timber extraction rather than extractive industries.

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TABLE 1 GLAD-L Deforestation Hotspots Alerts by Township (September-April)

Region	Township	Total Alerts	High-Confidence	Total Hectares
Magway	Htilin	18	0%	1
Magway	Saw	57	11%	4
Sagaing	Kathan	38,111	59%	428
Sagaing	Banmauk	12,787	59%	144
Sagaing	Inndaw	4,368	52%	52
TOTAL	**55,340**			**629**

TABLE 2 Number of Assigned Alert Points by Activity Types

Township	Charcoal Production	Mining	Shifting Cultivation	Total Points
Katha	3	8	33	44
Inndaw	-	6	35	41
Banmauk	-	49	14	63
Saw	-	-	24	24
Htilin	-	-	37	37
TOTAL	**3**	**63**	**143**	**209**

2. THE HUMANITARIAN-ENVIRONMENTAL NEXUS: DISPLACED COMMUNITIES AND FOREST PRESSURES

While mining garnered attention as an unexpected threat, smallholder subsistence agriculture represented 68 percent of documented deforestation based on satellite imagery (143 of 209 cases), particularly in Magway Region where all investigated alerts were attributed to shifting cultivation. However, this finding revealed greater complexity rather than simple deforestation hotspots and environmental degradation.

In many cases, villagers clearing swidden cultivation plots were IDPs fleeing fighting in their nearby home villages. NUG MONRECE field officers encountered families who had lost their homes, farms and livelihoods, and sought survival in forest reserves. Importantly, ground truthing revealed that, in most instances, these new shifting cultivation sites did not involve clearing intact forest; rather, displaced communities were cultivating areas already heavily disturbed by previous unknown activities. This nuance proved critical for enforcement decisions: while mining operations faced penalties, farmland expansion in such areas received warnings to prevent further encroachment, with current cultivation tolerated during the crisis period.

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This humanitarian dimension forced a recalibration of enforcement approaches. Rather than treating forest protection and humanitarian needs as competing priorities, the project demonstrated their interdependence. Community meetings and awareness campaigns acknowledged the crisis circumstances, while simultaneously working to prevent further expansion into intact forest areas. This balance between firm enforcement on mining and illegal logging with flexibility on subsistence agriculture by displaced populations reflects the realities of forest governance during armed conflict.

The project revealed that effective environmental governance during crisis requires understanding not just what is happening to forests, but why communities make the choices they do under extraordinary pressure.

3. TECHNOLOGY MEETS LOCAL KNOWLEDGE

The project's success is attributed to equipping local governing institutions with global monitoring tools and the know-how on its effective use, while relying on their locally nuanced knowledge to interpret and act on the remotely-sensed deforestation data. The main elements of the project included:

Training and Capacity Building: Starting in August 2024, fifteen NUG MONREC field-based township officers and administrators received comprehensive training on using the GFW web-based deforestation hotspot monitoring dashboard and the Forest Watcher mobile application. Training materials included GFW videos with Burmese subtitles, ensuring accessibility and long-term sustainability beyond the project period.

Real-time Satellite Monitoring: From September 2024 through April 2025, trained officers monitored satellite alerts across 1,064,100 hectares of state forest reserves. The system detected 55,340 deforestation alerts, with Sagaing Region accounting for nearly all the alerts.

Ground Truthing in Challenging Conditions: Field teams carefully selected alert points for ground-based investigation based on security assessments. Some areas remained completely inaccessible due to proximity to military camps. Using approximate GPS coordinates and prior security intelligence, teams navigated to deforestation hotspot alert sites, assessed forest disturbance levels, identified drivers using Forest Watcher offline, and reported findings. Despite not being able to get to certain areas, operating with limited internet connectivity and monsoon disruptions, teams successfully completed 209 ground-truthing investigations.

This combination of sophisticated satellite technology and local expertise proved that, even during political upheaval and disrupted governance, systematic environmental monitoring remained feasible with appropriate support and tools.

4. FROM DATA TO ACTION

The project's impact extended far beyond data collection. Findings catalyzed immediate policy responses, enforcement actions, and institutional change within NUG MONREC.

Concrete Enforcement Successes:

- Two mining operations penalized and shut down
- One illegal timber operation halted
- Multiple farmland expansion warnings issued to prevent further agricultural encroachment
- Awareness campaigns and community meetings conducted in affected villages to educate residents about protected forest boundaries

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Despite security constraints limiting enforcement capacity in some areas, these interventions demonstrated that even subnational governance structures in Myanmar can exercise authority, especially when equipped with credible data and clear evidence.

Institutional Transformation: The unexpected prominence of mining as a deforestation driver prompted immediate institutional response. When findings were shared with NUG MONREC leadership, the Minister and Forest Department head recognized a critical capacity gap and commissioned a comprehensive training series from February 14 to March 9, 2025. Invited experts conducted sessions every weekend covering mining's socio-environmental impacts, including mercury poisoning risks, ecosystem damage, and regulatory approaches. This training fundamentally shifted MONREC's understanding of newly emerging forest threats.

Inter-ministerial Coordination: The new findings on the extent of mining impact catalyzed new coordination mechanisms between NUG MONREC and other NUG ministries, including their Ministry of Home Affairs and Immigration (law enforcement), Ministry of Mines, and Ministry of Planning, Finance, and Investment (administration and taxation). This inter-departmental approach recognizes that addressing mining-driven deforestation requires regulatory frameworks beyond forest management alone.

Sustained Monitoring Capacity: NUG MONREC now maintains an active geo-referenced database of deforestation hotspots, identified drivers, community outreach efforts, and enforcement actions. This database serves as both an operational tool for prioritizing future monitoring and as a benchmark of deforestation pressures during the political crisis, which is critical for measuring progress when governance functions normalize.

Two internal reports were circulated among NUG MONREC staff and leadership, with findings directly informing policy discussions and management strategies. The project introduced a new paradigm for forest threat assessment, moving beyond traditional logging-focused monitoring to address the complex, multi-faceted drivers of degradation in conflict contexts.

4. WHY THIS MODEL MATTERS: LESSONS FOR CRISIS ZONES WORLDWIDE

This pilot project offers insights that could extend beyond Myanmar's borders, demonstrating principles applicable to environmental governance in fragile and conflict-affected settings globally.

Subnational Monitoring Is Possible and Powerful: The project proved that localized, township-level monitoring can function even when national governance structures are disrupted. Despite operating under extraordinary constraints—active conflict, military checkpoints, displaced populations, infrastructure damage, limited connectivity—NUG MONREC forest officers successfully implemented systematic monitoring and enforcement. This demonstrates that with appropriate leadership, tools, training, and support, local institutions possess both the capacity and legitimacy to manage natural resources during transitions, rather than waiting for stability to restore governance. With satellite tools and clear protocols, the system generated actionable intelligence that informed both immediate enforcement and longer-term policy development.

This decentralized approach aligns with Myanmar's potential federalist structure for natural resource management, offering a model for decentralized governance that respects local authority while maintaining environmental standards.

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More Rapid Data Analysis Challenges Static Assumptions: Conventional wisdom held that illegal logging would dominate Myanmar's deforestation crisis. Without relying on costly centrally managed forest inventories, new technologies (ground-truthed satellite data) revealed mining as equally critical and more difficult to reverse. This finding underscores the importance of evidence-based approaches, particularly in rapidly changing contexts, which need more rapid and frequent assessments.

Transparency Builds Trust: By documenting deforestation drivers openly with local communities and responding with evidence-based policies, the project demonstrated a commitment to environmental accountability by subnational entities. This transparency—publishing findings, adjusting management approaches based on data, acknowledging both successes and limitations—strengthens public trust in institutions, which is critical during times of crisis.

Environmental and Humanitarian Goals Mutually Reinforcing: The project's differentiated enforcement approach—strict penalties for mining, warnings and education for displaced farmers—showed that conservation and humanitarian concerns can be mutually reinforced. By treating communities as partners in forest protection rather than adversaries, and by acknowledging the survival pressures they face, enforcement was perceived as legitimate.

5. LOOKING FORWARD: SCALING IMPACT AND SUSTAINING PROGRESS

The pilot project established proof of concept. The challenge now is scaling this model to maximize impact across Myanmar's forest landscapes and demonstrate its applicability in other crisis-affected regions.

Immediate Next Steps

Expanding Geographic Coverage: The current pilot covers five townships across 1.06 million hectares. Myanmar's protected forest system encompasses far more territory, particularly in regions experiencing high deforestation pressure. Scaling monitoring to additional townships, especially those with suspected mining activity or high conflict displacement, would provide comprehensive national coverage and strengthen NUG MONREC's management capacity.

Sustaining Ground Truthing Operations: While satellite monitoring can continue using freely available GFW tools, field verification requires ongoing resources for transportation, field expenses, and security assessments. Dedicated funding for ground truthing ensures that satellite alerts translate into accurate threat identification and appropriate responses, rather than remaining unverified data points.

Strengthening Inter-ministerial Coordination: The discovery of mining as a primary driver revealed the need for coordinated natural resource governance across multiple ministries. Supporting formalization of inter-ministerial protocols, such as data sharing, joint enforcement operations, and harmonized regulatory approaches, would create systemic capacity to address complex environmental challenges rather than fragmented, sector-specific responses.

Building Enforcement Capacity: While the project achieved enforcement successes, significant deforestation occurred in areas where security constraints prevented intervention.

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When and where conditions allow, training and equipping additional forest officers, developing security protocols for higher-risk areas, and establishing rapid response mechanisms would enhance NUG MONREC's ability to translate monitoring data into more effective forest protection.

Long-term Vision: By maintaining comprehensive deforestation data, identifying evolving threats, and responding with adaptive policies, Myanmar's forest governance can emerge from this crisis period stronger and more resilient. The database being built now documents pressures, responses, and outcomes, which will serve as a benchmark when stability returns, enabling measurement of recovery and informing restoration priorities.

Environmental governance during conflict is often overlooked, treated as a luxury to address after peace is achieved. This project demonstrates that protecting natural resources during crisis supports peacebuilding itself.

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