

Building Resilient Teak Forests in Myanmar Through Integrated Pest and Disease Management

BACKGROUND

Myanmar's teak (*Tectona grandis* Linn.f.) forests are globally recognized for their exceptional quality and economic value. However, these valuable forests are increasingly threatened by insect pests, diseases, and the growing impacts of climate change, which reduce timber quality, hinder plantation productivity, and endanger long-term forest sustainability.

To address these challenges, the project (AFoCO/014/2020) is enhancing the health and resilience of teak forests in the West Bago Yoma Region through Integrated Pest and Disease Management (IPDM). The initiative combines scientific research, practical field solutions, and capacity building to improve the prevention, detection, and management of forest pests and diseases.

The project is developing comprehensive pest monitoring systems, practical management guidelines, and modern diagnostic facilities at the Forest Research Institute (FRI) while strengthening the technical knowledge and skills of forestry professionals, researchers, and plantation managers. It also promotes collaboration among government agencies, research institutions, and the private sector to establish a sustainable network for monitoring and rapid response.



Figure 1. Capacity building activities recorded photos (Trainings and Knowledge sharing)
Source: Project Completion Report 2026

Aligned with the Asian Forest Cooperation Organization (AFoCO)'s commitment to sustainable forest management, climate change adaptation, and forest disaster risk reduction, the project is building a stronger foundation for healthy, productive, and climate-resilient teak forests. Through innovation, partnership, and knowledge sharing, it contributes to safeguarding one of Myanmar's most valuable natural resources for future generations.

Key Messages

- 1. Evidence-Based Decision-Making through Research and Monitoring:** The project generated critical baseline data on pest and disease incidence, severity, and environmental triggers, and developed a systematic monitoring system. This enables forest managers to transition from guesswork to timely, targeted interventions, detecting outbreaks early to minimize damage and avoid costly large-scale control measures.
- 2. Practical Control Measures and Tools Developed:** Research was translated into actionable solutions by identifying effective control measures for specific pests and diseases. These practical tools, combined with the monitoring system, provide a ready-to-use framework for integrated pest and disease management in teak plantations of Myanmar.
- 3. Strengthened Capacity and Empowered Stakeholders:** A robust capacity-building program including hands-on training, technical workshops, and updated forestry school curricula equipped government staff, private plantation owners, and students with practical IPDM skills. This created a knowledgeable community of practice that ensures the project's benefits are sustained long after completion.
- 4. Upgraded Diagnostic Laboratory Infrastructure:** The renovation and equipping of the Entomology and Pathology Laboratories at the FRI transformed them into a central hub for forest health diagnostics and research. These upgraded facilities enable continuous scientific inquiry, ensuring management strategies evolve with emerging threats.

IMPACTS

Evidence-Based Research and Monitoring

The project established a comprehensive pest and disease monitoring system and generated baseline data to support evidence-based forest management, enabling early detection and timely interventions to reduce damage and improve the effectiveness of pest and disease control.

The establishment of 7 permanent demonstration plots and the development of the "Pest Occurrence Calendar" provide a practical, field-based monitoring system. This allows plantation managers to anticipate seasonal pest threats (like defoliators) and implement timely control measures, thereby reducing potential damage.

By strengthening control over pest and disease outbreaks through measures like the demonstration plots and IPDM strategies, the project contributes directly to the conservation of biodiversity within teak plantations and surrounding areas. This, in turn, helps maintain the ecological health and resilience of these forest ecosystems.

Long-Term Sustainability

The project institutionalized its achievements by integrating technical guidelines into the national forestry curriculum, adopting digital management systems, and upgrading laboratory facilities, ensuring lasting impacts on sustainable forest management. Healthier, better-managed teak plantations have a greater capacity for carbon sequestration. By ensuring the survival and growth of these valuable trees, the project contributes to Myanmar's climate change mitigation efforts.

Foundation for Digital Transformation

The development of the digital platform for forest plantation management and IPDM lays the groundwork for broader digital transformation within the forestry sector. It provides a platform for improved data collection, monitoring, reporting, and evidence-based decision-making, which is essential for modern forest governance.

Standardized Field Practices

The development and dissemination of the "Technical Guidelines" and the revised "Forest Protection" textbook provided a uniform, scientifically sound protocol for pest and disease control and prevention. This ensures all forestry staff, from researchers to field workers, are trained on the same effective methodologies.

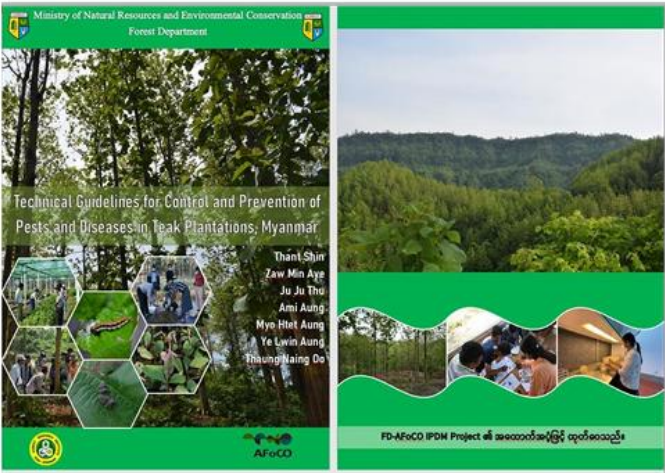


Figure 2. Publication (booklet): Technical Guidelines for Control and Prevention of Pest and Diseases in Teak Plantations, Myanmar
Source: Project Completion Report 2026

Practical Knowledge Transfer at the Grassroots

The distribution of pamphlets in the Myanmar language and vinyl posters on nursery pest and disease protection ensures that critical knowledge is accessible to nursery workers and local communities, translating complex scientific concepts into practical, on-the-ground actions.

Strengthening Human and Institutional Capacity

The project significantly strengthened Myanmar's institutional and human capacity for sustainable forest health management. The renovation and modernization of the Entomology and Pathology Laboratories at FRI established a national center for advanced pest diagnostics and biological control research, reducing reliance on external expertise.

Capacity-building efforts included 16 training sessions and 12 knowledge-sharing events, benefiting nearly 1,000 government forestry staff, private plantation owners, researchers, and university students with practical skills in IPDM.

The project also invested in developing future scientists through specialized training, including a study tour to the Kerala Forest Research Institute (KFRI) in India and hands-on research on *Trichoderma* spp. Together, these achievements have created a skilled workforce and a strong institutional foundation to support resilient, science-based forest health management in Myanmar.



Figure 3. Publication (booklet): Insects, Parasites, Fungi and Invasive Species in Forest of Myanmar and Forest Protection Text Book, Source: Project Completion Report 2026

FUTURE OPPORTUNITIES

Regional Knowledge Exchange and Collaborative Initiatives

The research findings, methodologies, and technical guidelines developed during this project serve as a valuable reference for regional knowledge exchange. There is a significant opportunity to share these results with other AFoCO member countries and neighboring nations to foster collaborative forest protection initiatives. This could involve regional workshops or joint research projects leveraging the established IPDM framework.

Advanced Digital Transformation and Information Systems

The successful development of a functional database and digital platform for forest plantation and pest management provides a foundation for further digital transformation. Future opportunities include integrating this software into the broader 30-year District Forest Management Plans to ensure transparent and efficient forest information processing, expanding the system to include real-time satellite or drone-based monitoring, building on the initial drone piloting training conducted during the project.

Strengthening the Capacity of Private Sector

While the project engaged some private sector owners, there is a clear opportunity to scale up technical capacity building for the growing private teak plantation industry in Myanmar. Future initiatives could focus on distributing translated technical guidelines and pamphlets more widely to private stakeholders, organizing dedicated on-site hands-on trainings specifically tailored to the operational realities of private commercial plantations.

Climate Change Resilience and Adaptive Pest Monitoring

Climate change is reshaping the forestry landscape, potentially introducing new pest species to our ecosystems. To stay ahead of these threats, we can invest in advanced diagnostic technologies capable of detecting emerging outbreaks as weather conditions evolve. By updating our pest prediction models to account for shifting seasonal windows, we ensure that plantation managers have the actionable insights needed to adjust their defense tactics instantly and effectively.

Long-term Research and Biological Control Development

The renovation of the Forest Entomology and Pathology Laboratories and the establishment of permanent demonstration plots provide the necessary infrastructure for ongoing research. Specific opportunities include further evaluation of biological control agents, such as *Trichoderma spp.*, which were isolated and identified as having potential against soil-borne plant pathogens.

Institutionalization of IPDM in Forestry Education

The project successfully updated the "Forest Protection" curriculum for the Myanmar Forest School. There is an opportunity to further integrate IPDM concepts into higher education by developing advanced specialized courses for the University of Forestry and Environmental Sciences (UFES), building on the knowledge-sharing activities already conducted with their students, utilizing the Forest Entomology Museum as a permanent educational resource for future generations of forestry professionals.

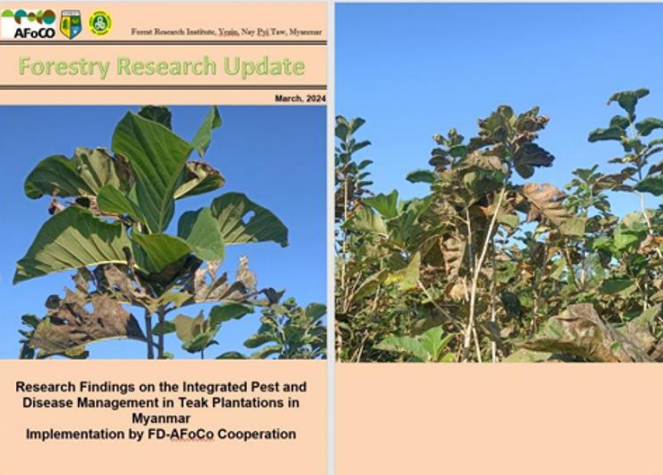


Figure 5. Two young researcher's the study visits at the KFR, India, Source: Project Completion Report 2026



Figure 6. Renovation of Laboratories at FRI (from 2022 to 2023) , Source: Project Completion Report 2026

Figure 4. Publication (booklet): Research Findings on the Integrated Pest and Disease Management in Teak Plantations in Myanmar (in English Language) , Source: Project Completion Report 2026

THE WAY FORWARD

The project has established a durable foundation for sustainable teak management in Myanmar by upgrading labs, training skilled staff, standardizing protocols, and implementing a monitoring system. To sustain this progress and meet long-term goals, key strategic priorities have been identified for the future.

Priority actions focus on institutionalizing project outcomes. The revised "Forest Protection" curriculum would become a mandatory part of all forestry education programs, ensuring future foresters are trained in Integrated Pest and Disease Management (IPDM). The digital plantation management platform should be adopted across all Forest Department divisions for consistent data use, while the upgraded laboratories will operate as a national reference center with dedicated funding and staffing to conduct research and provide diagnostic services nationwide.

To maximize impact, the project should extend its benefits to grassroots stakeholders and the private sector. A nationwide outreach program should distribute Myanmar-language technical guides and educational materials to plantation owners, smallholders, and communities, reinforced by hands-on, site-specific training to ensure consistent best practices. Concurrently, continued investment in young researchers through scholarships, mentorship, and regional collaboration will build on expertise in biological control agents and study tours, securing a steady talent pipeline to drive future innovation.

Under the AFoCO framework, hosting regional workshops, webinars, and study tours to disseminate methodologies and technical guidelines, while also pursuing joint research on transboundary pests, climate resilience, and biological control will strengthen regional cooperation, enhance the scientific capacity of the Forest Research Institute (FRI), Myanmar and solidify its status as a regional center of excellence.

To ensure long-term sustainability, the project can develop a national contingency plan for major pest and disease outbreaks, with clear protocols for rapid response, resource mobilization, and inter-agency coordination. These strategic priorities aim to scale and deepen the project's impact, securing a future where Myanmar's teak forests are managed with resilience and scientific integrity. The investment made today is not an endpoint, but a powerful beginning for a new era of sustainable forest management that will benefit generations to come.



Figure 7. Demonstration Plot Signboard and Conducting the activities at the Plot,
Source: Project Completion Report



Figure 9. Capacity Building Activities recorded photos
(Training and Knowledge Sharing)
Source: Project Completion Report



Figure 8. Vinyl and Pamphlets for Pest and Disease Management, Control Measures for the Forest Nursery:
Source: Project Completion Report 2026

ACKNOWLEDGEMENT

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