USAID Global Environment Center
Environment Notes

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Reduced-Impact Logging in the Tropics

What is Reduced-impact Logging?

Reduced-impact logging (RIL) refers to a type of forestry operation that incorporates the best harvesting and management techniques to reduce environmental damage or impact. It consists of practices and guidelines, which adapt "best logging techniques" based on existing biophysical conditions and forest type, harvesting systems, industry needs, and economic constraints. RIL guidelines expand upon the various regional, national, and local guidelines or "Codes of Practice."

In general, RIL focuses on timber operations, which involve both pre- and post-harvesting activities, and employ more careful planning and harvesting than is normally practiced. Pre-harvest activities can include inventory and mapping of individual trees for harvesting, optimal planning and construction of roads and trails, and cutting vines that link neighboring trees that could be pulled down or damaged when the harvested tree falls. Harvesting includes careful planning of how to cut the tree to direct its fall to minimize damage to remaining trees (directional cutting or felling), and cutting the stumps low to the ground to ensure efficient utilization. RIL operations also attempt to minimize the number of skid-trails (roads used when hauling felled trees out of the forest), as well as locating them strategically so that logs can be pulled out using a winch and tractor, rather than forcing the heavy tractors to move to the tree. These efforts decrease the amount of damage to the vegetation and reduce soil compaction. The potential environmental benefits are compelling: one study has demonstrated that RIL resulted in approximately 30 percent less damage as compared to conventionally logged areas. RIL also helps decrease the risk of fire and minimize the emissions of climate change related greenhouse gases that are produced when the litter and trees die and decay. Other studies indicate that RIL, in comparison to conventional logging, may help natural regeneration, reduce soil disturbance and erosion, protect water quality, reduce the negative impacts on wildlife, and protect biological diversity.

Photo: CJ Rushin-Bell

Kuda-kuda: traditional low-impact skidding in Sarawak, Malaysia

Decades of Destruction

Since the mid-1960s, logging has been radically transformed into a more mechanized and environmentally damaging and unsustainable activity. This is especially evident in the tropics where forestry operations have intensified as a result of the introduction of chain saws and bulldozers, the advent of large-scale road building, and expansion of global timber markets. The large-scale transformation of forested lands in many developing countries however, has been a result of nationally-sanctioned colonization and resettlement programs, and economic policies the government promotes to encourage forest conversion to agricultural development. The resulting land use changes threaten both economic development and environmental stability.

RIL has evolved in response to growing international concern over escalating deforestation and the resulting loss of biological diversity and threats of global warming. Conventional logging practices in the tropics are recognized as being a major force responsible for this loss, second only to the loss associated with agricultural conversion (slash-and-burn for crops and pastures, and establishing tree plantations). Most current logging operations in the tropics that deplete timber reserves and severely damage remaining forests are neither ecologically nor economically sustainable. Thus the long-term health and productivity of tropical forests will require techniques that promote sustainable forest management practices — reduced-impact logging is one such technique. Reducing the environmental impacts of timber harvesting is one of the main challenges that must be addressed to achieve sustain-able forest management.

Cost/Benefits of RIL

Actual cost-benefit analyses, comparing RIL to conventional logging, are limited. However, one study in Brazil suggests that RIL can be more profitable than conventional logging in some situations. Given the diverse nature of both forests and timber markets, it is essential to define the set of conditions that favor the financial aspects of RIL.

From a commercial industry perspective, RIL offers several additional benefits: (1) pre-harvest inventories of standing timber provide a marketing advantage to landowners and mills, which can establish forward contracts with buyers based on delivery of known volumes for specific species and help eliminate low prices and degradation associated with products that sit in mill yards because buyers cannot be found; (2) carefully planned directional felling and the increased use of tractors and winches to move logs increases worker safety which should result in lower insurance rates and a more secure workforce; and (3) eliminating the expense of enrichment planting (restoring some damaged vegetation to promote regeneration) may be an important economic incentive. Forests harvested under RIL techniques appear to regenerate faster, with a higher logged percentage of commercial species compared to those logged under conventional practices. This suggests that residual stands following RIL will be better able to sustain repetitive felling cycles.

USAID's Continued Support

USAID has been a leader in supporting the research and development of RIL methods, establishing demonstration sites, and training local communities and industry representatives on RIL techniques in South America and Asia. The Agency promotes the application of RIL in all managed forests. Working with partners, USAID continues to support applied research and building local human and institutional capacity necessary to evaluate and possibly adopt RIL techniques. Current studies focus on: (1) providing additional empirical evidence of the benefits of RIL (profitability, protection and conservation of biological diversity, reduced risk of fire, and enhanced carbon sequestration); (2) providing rigorous testing of RIL in a variety ecosystem types; (3) identifying impediments to the adoption of RIL practices (i.e., tariffs on the importation of equipment and machinery necessary for carrying out RIL); and (4) evaluating economic, agriculture, and forest policies, or institutional reforms needed to create incentives for its adoption and implementation. USAID recognizes RIL as an integral part in achieving economic and social aims of sustainable development, and as a tool to help achieve the objectives of improved forest management, environmental protection, conservation of biological diversity, and addressing the global threat of climate change.

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