In partnership with

Report on the Asia-Pacific Workshop

Reduced-Impact Logging: Challenges, Opportunities and Strategies in the Emerging Forest Carbon Economy

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Kota Kinabalu, Malaysia, 3-4 May 2012

Cover photo - Reduced Impact Logging in Papua New Guinea – good tree retention and regeneration one year after logging

Report prepared by Graham Wilkinson and Francis E. Putz (2012)

The contribution of Finella Pescott to the organisation of the workshop and review of a draft report on the workshop is gratefully acknowledged.

Abbreviations and Acronyms

CL	conventional logging
FAO	Food and Agriculture Organization of the United Nations
LEAF	Lowering Emissions in Asia's Forest
REDD+	Reducing Emissions from Deforestation and Degradation Plus
RIL	reduced-impact logging
SFM	sustainable forest management
SPC	Secretariat of the Pacific Community
UN-REDD	The United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
USAID	United States Agency for International Development

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Workshop participants

Back row (left to right) – Graham Wilkinson, Toshihiro Yamada, John Tay, Hari Priyadi, Art Klassen, Agnes Sumareke, Jonas Cedergren, Finella Pescott, Danilo Mollicone, Philippa Lincoln, Chisato Tomimura, Yong Teng Koon, Raubin Gampilok, Gregory Jean, Ika Heriansyah, Kevin Grace, Albert Radin, Michael Gallante, Barry Flaming, Paul Leo Lohuji.

Front row (L to R) – Karl-Peter Kirsch-Jung, Sairusi Bulai, David Ganz, Patrick Durst, Sandra Brown, Jack Putz, Rabbie Lalo

EXECUTIVE SUMMARY

A workshop entitled "Reduced-Impact Logging: Challenges, Opportunities and Strategies in the Emerging Forest Carbon Economy" was held in Kota Kinabalu, Sabah, Malaysia on 3-4 May 2012. The workshop was jointly organised by FAO and USAID's LEAF Program, with support from the Secretariat of the Pacific Community, UN-REDD and GIZ. It was attended by 28 international experts in the fields of reduced-impact logging (RIL), forest carbon and REDD+ (Reducing Emissions from Deforestation and Forest Degradation).

Key messages from the workshop were as follows-

1. RIL is an important component of sustainable forest management (SFM), but we should not forget the importance of other key criteria such as ample forest regeneration, sustained yields, and the maintenance of biodiversity.
2. Implementation of RIL can substantially reduce the environmental impacts of timber harvesting and reduce the emission of CO_2, by as much as 40% compared with conventional logging (CL). Much of the carbon gain from RIL is associated with the retention of forest in buffers (streams, steep country etc), as well as through less waste and damage to residual growing stock.
3. Whether RIL is more profitable than conventional logging (CL) depends upon the spatial and temporal scales of analysis. Financial cost savings and long-term economic benefits of RIL derive from better planning and training of workers in felling and bucking techniques as well as from the careful design and use of logging roads and skid trails. Short-term profit margins are reduced when RIL protocols require the protection of riparian buffer zones and the avoidance of logging on steep slopes. Research on this issue has suffered from lack of replication and the use of sample plots that do not capture much topographic heterogeneity. Although logging roads are costly in both financial and environmental terms, research on the economics of forest engineering and road development in tropical forests is particularly scarce.
4. The wider uptake of RIL continues to be hampered by concerns over its higher cost and loss of resource compared with conventional logging. However, there are encouraging signs of progress-
    a. In Indonesia, many concessionaires are voluntarily adopting RIL and participating in training programs
    b. RIL is widely seen as a first step towards forest certification
    c. Sabah intends to make RIL and certification compulsory for all concessions by 2014.
5. RIL has a key role to play in reducing forest degradation under REDD+.
6. Mechanisms for carbon accounting under REDD+ are most likely to apply at the national or regional scale, with monitoring systems based on combinations of remote sensing and field data.
7. Practical methodology has been developed for measuring forest carbon and for monitoring the losses and gains from harvesting and post-logging regeneration. Several permanent plots that could yield much important data on the longer-term impacts of selective logging remain to be remeasured or the data analysed.
8. Carbon markets alone are unlikely to be a major driver for RIL, but can be bundled with other incentives from improved forest management including forest certification and legality verification.
9. Future actions to promote the wider uptake of RIL within the Asia-Pacific region include:

a. Further demonstration areas across the region
b. Promote the benefits of RIL to local communities and to logging companies through industry associations
c. Promote the environmental and carbon benefits of RIL to policy-makers and lobbyists
d. Promote further RIL training and incorporate RIL into training curricula at all operational, technical, academic and professional levels
e. Promote the development of national standards for SFM that include RIL as well as key elements such as the maintenance of a permanent native forest estate and sustained yield.
f. Promote the ongoing development and adoption of regulatory frameworks for the implementation of RIL and for monitoring and reporting on the operational standards that are being achieved.

The findings of the workshop will be used to develop an action plan that will detail the strategies by which RIL can be promoted to international and national bodies, negotiators and the media as a key component of measures for reducing forest degradation and CO_2 emissions under REDD+. This plan will include a series of briefs that summarise the potential roles of RIL in reducing forest degradation and CO_2 emissions and the potential magnitude of financial costs and benefits of applying RIL in a forest carbon economy.

1. Background

Reduced-Impact Logging (RIL) has been widely promoted in the tropics as a means of reducing the environmental degradation caused by destructive and wasteful forms of timber harvesting. RIL is implemented through codes of practice and guidelines that cover activities such as forest management plans, road construction, tree felling, bucking, and log yarding. The benefits of RIL include reduced impacts on forest soils, hydrology, forest growth, and biodiversity as well as improved worker safety.

Good progress has been achieved in developing codes of practice and RIL guidelines in many countries. However, the wider application of RIL has been limited by a number of factors, including weak institutional capacity, poor political commitment, concerns over the financial cost of RIL and a lack of financial incentives to capture its environmental and social benefits.

The global debate about climate change has highlighted the critical role of forests in the sequestration of carbon. The United Nations Framework Convention for Climate Change (UNFCCC) has identified REDD+ (Reducing Emissions from Deforestation and Forest Degradation) as an effective way to reduce CO_2 emissions. The main focus to date has been on reducing deforestation with less attention to the substantial gains to be achieved by reducing forest degradation through improved forest management practices.

REDD+ and voluntary carbon market arrangements have the potential to become major drivers for the wider uptake of RIL. For this to occur, policy-makers, forest managers and other relevant stakeholders need to have access to accurate information about the relative impact of various management options on forest carbon stocks and flows.

2. Objectives of the workshop

The objectives of the workshop were to:

1. review the challenges and opportunities for the application of RIL in the emerging forest carbon economy, including REDD+;
2. review current knowledge about forest carbon measurement, reporting and verification and monitoring related to forest degradation and different management practices;
3. review the financial costs and benefits of applying RIL in a forest carbon economy; and
4. develop strategies to encourage increased application of RIL as a key mechanism for improving forest management and reducing carbon emissions under REDD+.

The planned outputs to flow from the workshop are as follows:

1. A report on the opportunities and strategies for further developing and promoting the implementation of RIL as a way to improve forest management and to reduce forest degradation and CO_2 emissions.
2. A series of briefs that summarise the potential roles of RIL in reducing forest degradation and CO_2 emissions and the potential magnitude of financial costs and benefits of applying RIL in a forest carbon economy, written in non-technical form (such as FAQ) for policy-makers, forest managers, forest communities, and the general public.
3. An action plan that details the strategies by which RIL can be promoted to international and national bodies, negotiators and the media as a key component of measures for reducing forest degradation and CO_2 emissions under REDD+.

3. Workshop program

The workshop was convened as a meeting of experts in the fields of RIL, forest carbon and REDD+. Twenty eight participants attended the workshop, representing 21 organisations that are involved in relevant projects within the Asia-Pacific region. Lead speakers were invited to present an overview of the state of knowledge and present case studies on the following key topics:

1. The measurement of forest carbon
2. The impact of RIL on forest carbon
3. Current opportunities and challenges for RIL
4. The role of certification in promoting RIL

The speakers' presentations were provided to participants and are available on request from FAO Regional Office for Asia and the Pacific (RAP) in Bangkok, Thailand (email: Sansiri.Visarutwongse@fao.org).

The lead speakers were followed by group discussions in which participants were asked to identify the key messages and actions for promoting wider uptake of RIL.

The workshop program is detailed in Appendix 1. The participants are listed in Appendix 2.

4. Key findings of the workshop

4.1 What role does RIL have as part of REDD+?

1. *What are the potential carbon gains from RIL compared with conventional logging?*

   Work by Francis E. Putz and others show that-

   - carbon retention in stands that are carefully logged under RIL guidelines is typically 10-40% higher than for conventionally logged stands,
   - much of the carbon gain is associated with the reduced impacts of roads and skid tracks as well as from areas that are reserved from logging under RIL guidelines (e.g. steep areas, stream buffers), and
   - forest growth and carbon recovery are much more rapid in stands logged under RIL than in conventionally logged stands, where recovery of carbon stocks can be limited by continued high rates of tree mortality, weed infestations, and poor regeneration of timber trees.

2. *What are the gaps/limitations in our knowledge about the impact of RIL on forest carbon and how can we address them?*

   - The carbon gains from RIL are well known from several studies but further work is needed to quantify the gains across more forest types and harvesting systems. Where possible, previous RIL trials should be re-measured and analysed to improve our knowledge of the longer term impact of RIL on forest carbon.

3. *Can the carbon benefits of RIL be readily quantified in a practical and affordable manner?*

   - Work by Sandra Brown and others clearly show that carbon gains from RIL can be measured using standard forest management and inventory techniques, including information from-
     - Remote sensing
     - Timber extraction rates, management plans and high resolution imagery
     - Allometric equations to estimate biomass from tree diameter data
     - Relationships derived from studies in similar forests to estimate root: shoot ratios so as to avoid the costs and difficulties of sampling below-ground biomass.
   - It is not necessary to measure all of the components of forest carbon; some components show little change and/or represent very low proportions of the total carbon pool.

4. *Can carbon accounting be incorporated into routine forest management processes, especially pre-harvest and post-harvest surveys?*

   - Yes, standard forest management measurements can be readily modified for carbon accounting (see #3 above).

5. *What are the changes to logging practices that are needed to enhance the carbon benefits?*

   - Implementation of the harvesting practices detailed in RIL guidelines will result in substantial increases in the retention and recovery of carbon stocks in forests. Further carbon gains will be achieved through the application of other key elements of sustainable forest management, particularly those related to sustained yield and forest regeneration.

6. *How can practical guidelines for 'best practice carbon management' be incorporated into RIL guidelines and codes of practice?*

    - Many existing RIL guidelines and codes of practice already contain many of the key elements for achieving carbon benefits, such as improved roads and skid trails, directional felling to reduce damage and waste, and buffers on streams and steep areas. However, more can be done to encourage the implementation of the guidelines and codes through training and regulation.

4.2 The RIL Matrix

1. *What are the drivers for RIL?*
    - The key drivers for RIL are as follows-
        - *Market pressure and forest certification* - RIL is considered to be one of the stepping stones to achieving forest certification
        - *Corporate social responsibility* - Many forest management agencies and some large companies are voluntarily introducing RIL as part of a commitment to sustainable forest management
        - *Improved commercial returns* - It is evident that RIL will result in lower immediate financial returns than CL on many sites due to the loss of resource within buffers and the higher costs of planning. These losses may be offset on some sites through greater efficiencies in the location and use of roads and skid trails and better recovery of timber from improved felling and bucking techniques. Longer term economic benefits of RIL over CL are not well quantified but are likely to accrue as a result of better regeneration and growth than those achieved in CL stands.

2. *Who are the key players for promoting RIL? –*

    - All of the following bodies are important or could be important in promoting RIL-
        a. Forest owners
        b. Communities and civil society
        c. Forestry companies
        d. Governments and bureaucrats
        e. Environmental groups
        f. International assistance bodies
        g. Scientists and research bodies
        h. International certification bodies
        i. International forums on climate change and REDD+ etc.
        j. International markets
    - It is highly commendable that some governments and certification schemes are promoting RIL. However, there is a danger that a narrow focus on RIL means that some of the other important aspects of SFM, especially silviculture and sustained yield, are not receiving the attention that they warrant. In particular, there are concerns that short cutting cycles are resulting in declining yields and the loss of some structural elements and species diversity in many tropical forests.

3. *What are the constraints on wider uptake of RIL, including financial, R&D, education/training, infrastructure & resources, commitment and governance?*
    - In many situations, RIL cannot compete with the higher short-term profits that can be gained from highly exploitative (destructive) logging, particularly where such logging is a prelude to the conversion of the forest to more lucrative forms of land use such as oil palm plantations.
    - There is a need for more training for logging operators and the staff of forest agencies throughout the region

- There is a need for more RIL demonstration areas throughout the region to demonstrate the benefits of RIL to local forest owners and logging companies.
- Stronger commitment is needed from governments at the national and sub-national levels

4. *Which bodies are constraining wider uptake and why?*
    - Many logging companies are reluctant to implement RIL because of concerns about lower commercial returns and a lack of long-term resource security.
    - Forest owners in many places can derive higher incomes by exploitive logging followed by conversion to other land use.
    - Some governments are failing to support RIL because of the desire to maximise incoming streams of revenue.
    - There is concern that some governments and certification auditors sometimes set standards that fall short of wider regional or international expectations or benchmarks.

5. *How can these constraints be overcome?*
    - More demonstration areas, education and training programs will help to overcome the lack of knowledge about the longer term benefits of RIL. These have all been successfully used to promote the wider uptake of RIL.
    - More engagement with key stakeholders such as landowners and forest companies
    - Laws and policies can be important drivers for RIL providing that they are supported by appropriate and effective regulatory frameworks. For example, Sabah is moving to make RIL and certification compulsory for all concessions by 2014.
    - Forest certification bodies are highly supportive of RIL. FSC is currently developing international generic standards for maintaining carbon stocks. Longer term concessions may provide an incentive to manage forests more sustainably, including the implementation of RIL. This will require policy reform and the support of governments, landowners and industry.

6. *How important is REDD+ as a potential driver for RIL?*
    - RIL has a key role to play in reducing forest degradation under REDD+. However, mechanisms for carbon accounting under REDD+ are most likely to apply at the national or regional scale rather than at the project or operational scale.
    - Carbon alone is unlikely to be a major driver for RIL, but it is another important component of the multiple environmental benefits associated with improved forest management.

4.3 Key messages and actions to promote RIL

1. *What are the key messages for promoting wider uptake of RIL?*
    - The key messages are as follows-
        - RIL has benefits in terms of improved outcomes for residual stand quality, protection of streams and biodiversity.
        - RIL has benefits for forest carbon.
        - RIL can have financial benefits.
        - RIL is an essential component of SFM.
        - RIL is an essential stepping stone towards forest certification.
        - Countries and forest companies can use RIL to demonstrate their commitment to corporate social responsibility.

- RIL increases the technical skills within the forestry sector and enhances job opportunities within the region.
- RIL and SFM should be encouraged through appropriate regulatory frameworks.
- Encouraging progress is being made with respect to the wider uptake of RIL through both voluntary and mandatory approaches.

2. *What actions are needed to promote RIL as part of sustainable forest management and as a component of REDD+?*
    - continuing documentation of financial costs and benefits
    - continuing training programs and demonstration areas
    - encouraging international organizations to promote political support and commitment for RIL at the national level
    - promoting the benefits of RIL to local communities, NGOs, and other important stakeholders
    - encouraging and promoting forest certification
    - improving regulatory frameworks and enforcement
    - including RIL in forestry curricula at all levels of forestry training and education
    - promoting RIL as a tool to achieve sustainable management of forests by way of submissions from relevant parties to the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UN Framework Convention on Climate Change
    - conducting case studies in all countries to assess and document the mitigation benefits of RIL as part of national or regional-level approaches to REDD+
    - explicitly communicating that RIL can form a major part of national REDD+ strategy to mitigate the effects of deforestation and degradation

3. *What communication and engagement strategies are needed to promote RIL to the various* players?
    - Promote the development and monitoring of national standards for SFM that include RIL and other key elements such as the maintenance of a permanent native forest estate and sustained yield from wood production zones.
    - Continue to promote the broad benefits of RIL, including its potential for carbon.
    - Ensure that communication and engagement strategies are specifically designed for the different target groups (e.g. local communities, forest companies, policy/decision-makers etc.).
    - Improve the documentation that supports RIL, particularly RIL guidelines, manuals and audit standards.

4.4 Further work

- The findings of the workshop will be used to develop an action plan that will detail the strategies by which RIL can be promoted to international and national bodies, negotiators and

the media as a key component of measures for reducing forest degradation and CO_2 emissions under REDD+.

- This plan will include a series of briefs that summarise the potential roles of RIL in reducing forest degradation and CO_2 emissions and the potential magnitude of financial costs and benefits of applying RIL in a forest carbon economy.
- The action plan and briefs will be circulated to the workshop participants for information and comment.

APPENDIX 1 – Workshop Program

Thursday 3 May 2012		
8.00am	**Registration**	
8.30am	**Session 1 - Opening**	
	Introduction to the workshop	Patrick Durst
	Opening address: Implementation of RIL in Sabah	Fred Kugan
9.00am	**Session 2 - The measurement of forest carbon**	Chair: David Ganz
	Overview: current methods for monitoring emissions and removals from forest harvesting operations	Sandra Brown
	Carbon accounting under the Kyoto Protocol and REDD+	Danilo Mollicone
10.00am	Morning tea	
10.30am	**Session 3 - Forest harvesting and forest carbon emissions**	Chair: Barry Flaming
	Overview: The impact of RIL on forest carbon emissions	Jack Putz
	Is there carbon money to be made from RIL?	John Tay
	Case study: Can REDD+ promote RIL in Malaysian tropical forests?	Toshihiro Yamada
12.00pm	lunch	
1.00pm	**Breakout groups: RIL as part of REDD+** 1. What are the benefits of RIL for forest carbon? 2. How can practical guidelines for 'best practice carbon management' be incorporated into RIL guidelines and codes of practice?	Facilitator: Graham Wilkinson
2.00pm	**Plenary: discussion of group findings**	Panel: Sandra Brown and Jack Putz
2.45pm	Afternoon tea	
3.15pm	**Session 4 - Current opportunities and challenges for RIL**	Chair: Pat Durst
	Overview: Twelve Years of RIL: The TFF-Indonesia Experience	Art Klassen
	Case study - Reduced Impact Logging in Sabah	Kevin Grace
	Opportunities and Challenges in RIL Carbon: Experiences from Sabah, Malaysia	Michael Galante
7.00pm	Workshop dinner	

Friday 4 May		
8.30am	**Session 5 - The role of certification**	Chair: Sairusi Bulai
	Carbon stewardship under FSC	Gregory Jean
	The role of forest certification in promoting greater uptake of RIL and implications of REDD+ for forest certification programs	Yong Teng Koon
9.30am	**Breakout groups: The RIL matrix**	
	1. Who are the players and what are their perspectives on RIL? 2. What and who are the drivers for RIL? 3. What are the constraints on wider uptake? 4. How can these constraints be overcome?	Facilitator: Graham Wilkinson
10.30am	Morning tea	
11.00am	**Plenary: discussion of group findings**	Panel: John Tay, Art Klassen and Chisato Tomimura
12.00pm	Lunch	
1.00pm	**Breakout groups: Key messages and actions to promote RIL**	
	1. What are the key messages for promoting wider uptake of RIL? 2. What actions are needed to promote RIL as part of SFM and REDD+?- 3. What communication and engagement strategies are needed to promote RIL to the various players?	Facilitator- Graham Wilkinson
2.30pm	Afternoon tea	
3.00pm	**Plenary: discussion of group findings and summary of key messages and actions to promote RIL**	Panel: Graham Wilkinson, Pat Durst, David Ganz and Jack Putz
4.00pm	**Closing remarks: where to from here?**	David Ganz and Graham Wilkinson

APPENDIX 2 – List of participants

Person	Organisation	e-mail
Dr Sandra Brown	Lowering Emissions in Asia's Forests (LEAF)/Winrock, UK	sbrown@winrock.org
Sairusi Bulai	Secretariat of the Pacific Community, Fiji	sairusib@gmail.com sairusib@spc.int
Dr Jonas Cedergren	University of Sweden	jonas.cedergren@slu.se
Patrick Durst	FAO, Bangkok	patrick.durst@fao.org
Barry Flaming	USAID, Bangkok	bflaming@usaid.gov
Michael Galante	University of Edinburgh	m.v.galante@sms.ed.ac.uk
Raubin Gampilok	Sabah Forestry Department	raubin.gampilok@sabah.gov.my
Dr David Ganz	Lowering Emissions in Asia's Forests (LEAF), Bangkok	dganz@leafasia.org
Dr Kevin Grace	Global Forestry Services, Malaysia	kevin@gfsinc.biz
Ika Heriansyah	Indonesia Ministry of Forestry, Forest Research and Development Agency (FORDA), Jakarta	ika_heriansyah@yahoo.com
Gregory Jean	FSC International Center, Germany	g.jean@fsc.org
Karl-Peter Kirsch-Jung	GIZ/SPC, Fiji	karl-peter.kirsch-jung@giz.de
Arthur Klassen	Tropical Forest Foundation, Indonesia	tff@cbn.net.id
Yong Teng Koon	Malaysian Timber Certification Council (MTCC), Kuala Lumpur	yongtk@mtcc.com.my
Frederick Kugan	Sabah Forestry Department	frederick.kugan@sabah.gov.my
Rabbie Lalo	PNG Forest Authority, Port Moresby	rlalo@pngfa.gov.pg
Dr Philippa Lincoln	LTS International, UK	philippa-lincoln@ltsi.co.uk
Paul Leo Lohuji	Sabah Forestry Department	paul.lohuji@sabah.gov.my
Danilo Mollicone	FAO/ UNREDD, Rome	danilo.mollicone@fao.org
Finella Pescott	FAO, Bangkok	finella.pescott@fao.org
Hari Priyadi R	CIFOR, Indonesia	h.priyadi@cgiar.org hari.priyadi@slu.se
Jack Putz (Dr Francis E. Putz)	University of Florida	fep@ufl.edu
Albert Radin	Sabah Forestry Department	albert.radin@sabah.gov.my
Agnes Sumareke	PNG Forest Research Institute, Lae	asumareke@fri.pngfa.gov.pg
Dr John Tay	University of Malaysia, Sabah	johntay@ums.edu.my
Chisato Tomimura	Rainforest Alliance, Indonesia	ctomimura@ra.org
Graham Wilkinson	Consultant (FAO), Tasmania	graham.wilkinson@fpa.tas.gov.au
Dr Toshihiro Yamada	Graduate School of Integrated Arts and Sciences Hiroshima University, Japan	yamada07@hiroshima-u.ac.jp