

Sustainable biomass production  
Lessons from plantation forestry

# 持続的バイオマス生産 産業植林からの教訓

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## Topic of this presentation

- Site management and productivity of tropical fast wood plantations.
- 熱帯早生樹人工林の生産力と立地管理
- Lessons from rehabilitation after forest fire
- 火災後の森林修復からの教訓.
- 昨日の議論により 途上国の森林減少および森林劣化による排出削減(REDD)を追加
- Because of discussion on yesterday afternoon, I add Reduced emission from deforestation and forest degradation in developing countries (REDD).

# Sustainable Production from planted forests in the tropics

“tropical plantation forests can be  
managed to increase and maintain their  
productivity” (Nambiar and Kallio 2008)

**19 November 2009**  
**Hiroshima**

# According to FRA2005

Global Forest Resources Assessment 2005, (FAO 2006)

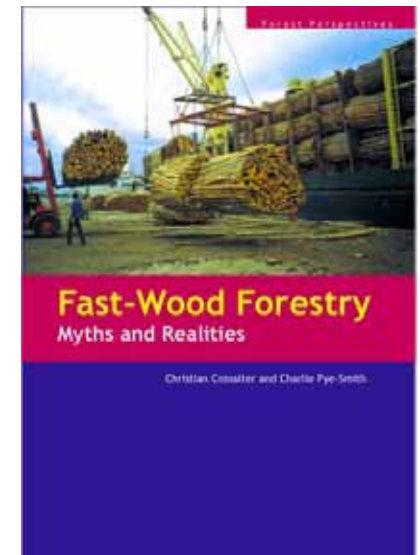
- The area of planted forests is less than 5% of the total forest area.
- Planted forests provide nearly 50% of global wood demand.
- Area and importance in wood supply of planted forests are increasing.

# Pros and Cons of Tropical planted forests

- Expected higher productivity because of suitable environment for plant growth.
- Lower cost for lands and workers
- Variation of productivity because of variation of soil and water availability
- Lack of experience and/techniques in silviculture
- Socio-economic constrains

# A review on the controversy of Tropical planted forests is available at

- Summary of the book
- Will the eucalypts eat your children? (Thursday, June 19, 2003)
- <http://www.cifor.cgiar.org/Publications/Polex/PolexDetail.htm?&pid=495>
- 日本語紹介文 2003年6月19日付け ユーカリは子供を食べるか？
- [http://www.cifor.cgiar.org/Knowledge/Polex/Japanese/2003/2003\\_06\\_19.htm](http://www.cifor.cgiar.org/Knowledge/Polex/Japanese/2003/2003_06_19.htm)
- Free PDF download from
- <http://www.cifor.cgiar.org/Knowledge/Publications/Detail?pid=1257>



**Repeated harvest may result in deficiency of available nutrients.**

**We can limit nutrient removal by sustaining leaves and branches at the site.**

Productivity of 40 industrial short rotation  
Plantations (Yamada et al. 2004)

MAI of *Acacia* spp. 7.8 - 10.5 t ha<sup>-1</sup> yr<sup>-1</sup>

MAI of *Eucalypts* spp. 3.1 - 22.9 t ha<sup>-1</sup> yr<sup>-1</sup>

*Abstract of Yamada et al. 2004 is available at*

<http://www.cifor.cgiar.org/Knowledge/Publications/Detail?pid=1524>

*The Yamada's paper is available in the proceedings  
available at*

<http://www.cifor.cgiar.org/Knowledge/Publications/Detail?pid=407>

## To be realistic

- Researchers tend to get maximum growth rate of target species and show it as potential rates.
- Those “potential rates” can be achieved only in plots under **very** good management.

# We cannot achieve potential yield in field.

- The potential yield only be achieved limited condition.
- Actual yields may be much less than that expected in experimental site.
- Even within the same species, there will be large variation in yields because of site and climate condition and management treatments
- Large areas of tropical plantation remains in poor condition and grow at rates far below their potential.

# Needs for research

- Substantial research is required to understand the site and species specific factors which limit production of plantation when we develop a new plantation.
- Proper management options are to be developed and implemented based on the sound scientific researches.

# Issue beyond techniques

- It needs to be realized that management options cannot be implemented in the field exactly as prescribed by basic researches.
- Trade-offs and compromises between research results, costs and operational issues together result in the management decision.
- It is critical that the costs for the forestry operations will be compensated by the increase or maintenance of productivity.

- Both science-based technical and socio-economic information are vital for increasing and sustaining production from planted forests.
- Knowledge and Information are to be delivered tree growers on the ground as well as users of the products from planted.
- Those lessons shall be learnt for bio-fuel plantation development.

# Site Management and Productivity in Tropical Plantation Forests

Proceedings of Workshops  
in Piracicaba (Brazil) 22-26 November 2004  
and Bogor (Indonesia) 6-9 November 2006



Editor  
E.K. Sadanandan Nambiar



For more information on sustainable production of tropical planted forests  
Please see CIFOR's "Site management and productivity in tropical plantation forests" at  
<http://www.cifor.cgiar.org/Knowledge/Publications/Detail?pid=2517>

## Lessons from rehabilitation after fire

For fire prone area, forest rehabilitation needs to have a measure for controlling fires. Otherwise, fires would occur and burn the planted area repeatedly.

In fact, many cases, the beneficiaries of forest rehabilitation projects subsequently burned the project area so that they could be re-employed in the process of replanting or rehabilitation

For more information please visit

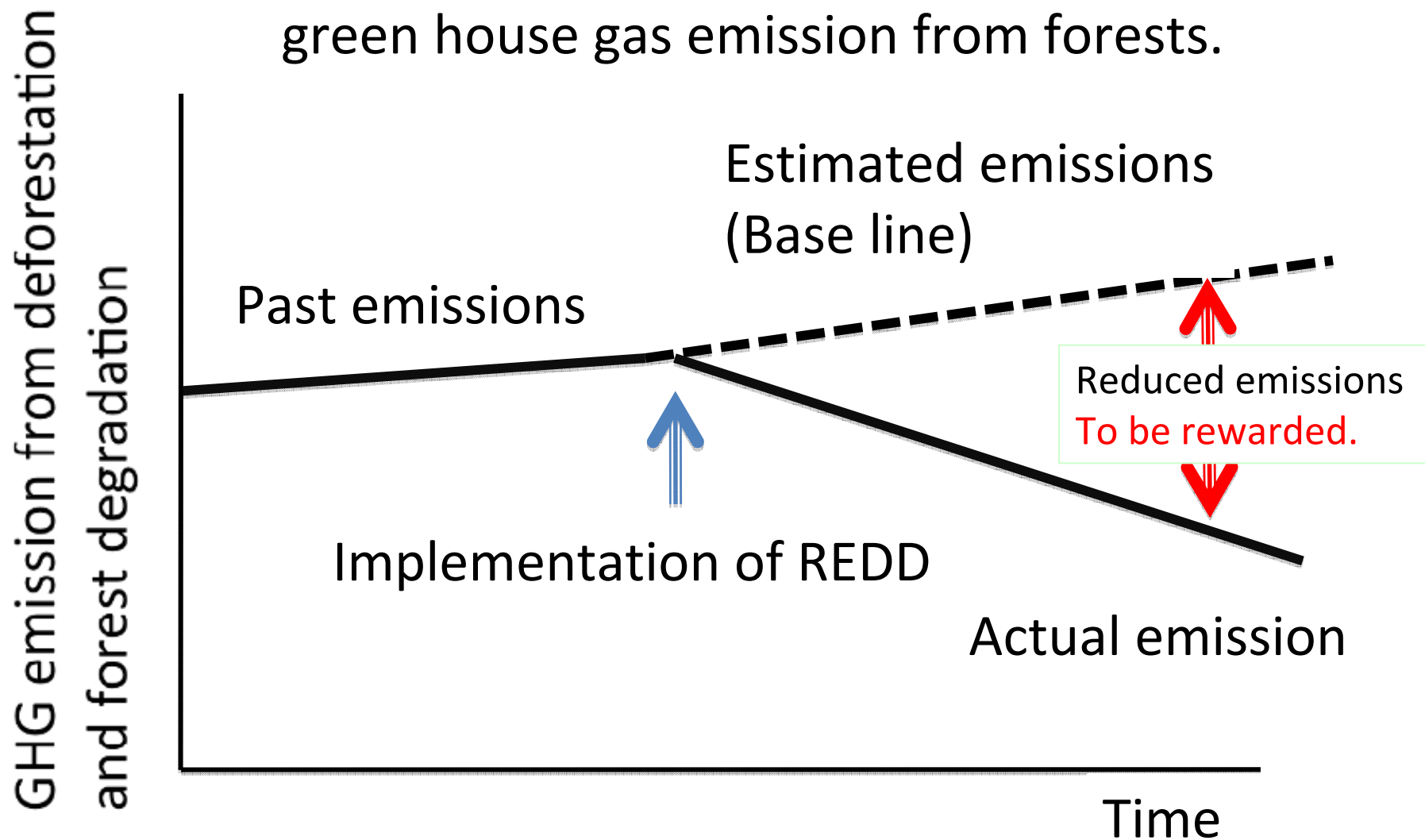
<http://www.cifor.cgiar.org/Publications/Corporate/AnnualReports/English2006/rehabilitation.htm>

[http://www.cifor.cgiar.org/rehab/\\_ref/links/publications.htm](http://www.cifor.cgiar.org/rehab/_ref/links/publications.htm)

# About REDD

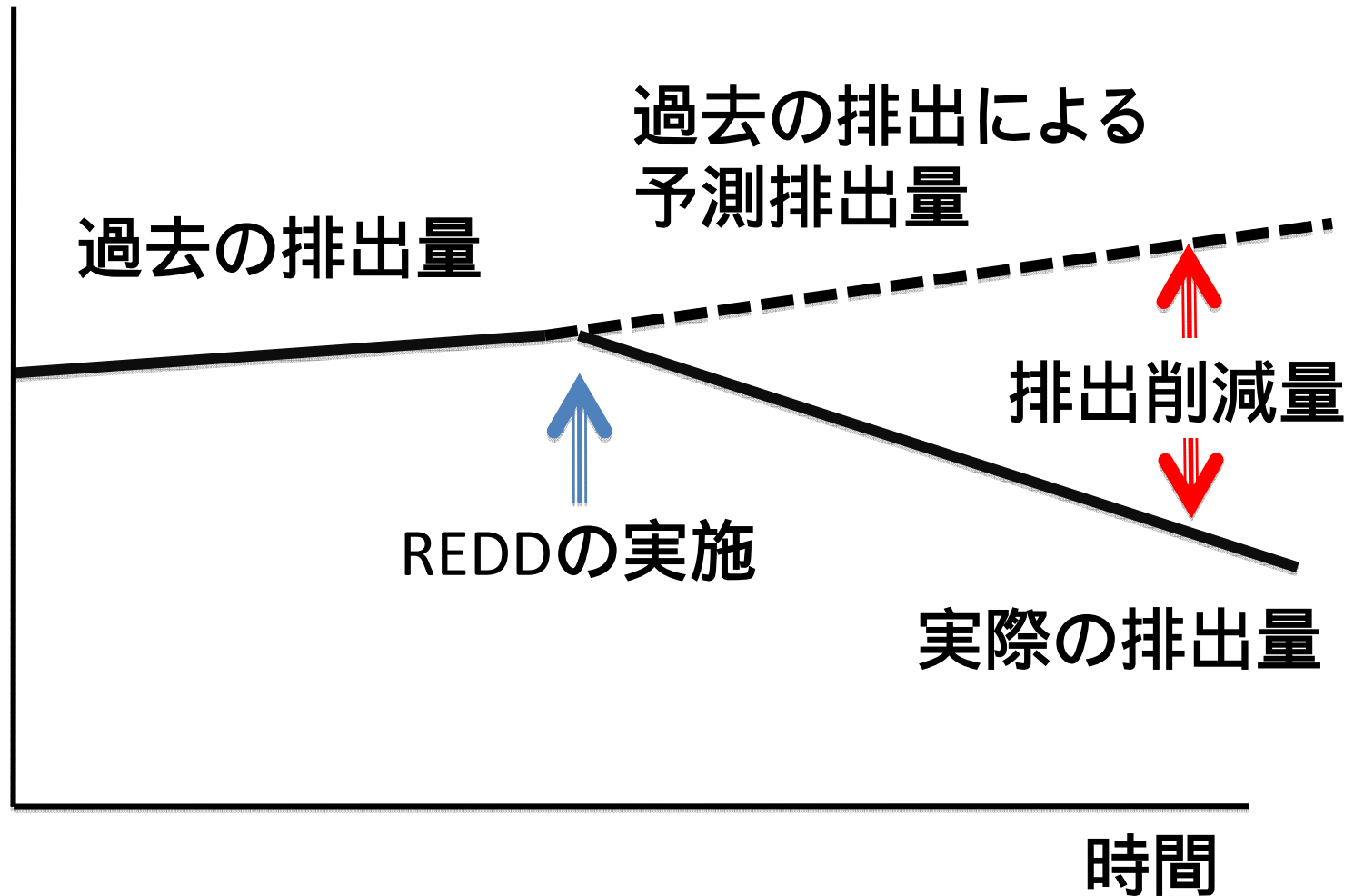
- Reducing Emissions from Deforestation and forest Degradation in developing countries (REDD) has been discussed under UNFCCC as an important option for mitigating climate change.
- REDD is based on a simple idea:
- reward individuals, communities, firms, projects and countries that reduce forest-related greenhouse gas (GHG) emissions.

The core idea of REDD is that reward the reduction of green house gas emission from forests.



REDDは森林からの排出削減に支払いを行う。

森林減少および森林劣化からの  
温暖化ガス排出



排出削減量に対して支払いがなされる。

## Angelsen(2009)

### “Will REDD make a difference?”

- REDD is based on a simple idea: reward individuals, communities, firms, projects and countries that reduce forest-related greenhouse gas (GHG) emissions.
- According to the proponents:
  - REDD has a *huge potential* (one-fifth of current global GHG emissions),
  - REDD is *cheap* (many deforestation and degradation activities are only marginally profitable),
  - REDD can be done *quickly* (‘stroke-of-pen’ reforms and no new technologies needed), and
  - REDD can produce *win-win-win* outcomes (climate, biodiversity and livelihood benefits).

“Will REDD make a difference?” is available at

[http://www.iucn.org/about/union/commissions/wcpa/wcpa\\_focus/?3955/Will-REDD-make-a-difference](http://www.iucn.org/about/union/commissions/wcpa/wcpa_focus/?3955/Will-REDD-make-a-difference)

# Financial Scale of REDD

- Estimates of the potential global value of REDD payments vary depending on the underlying assumptions.
- With more positive assumptions about the carbon price (\$10-20/t CO<sub>2</sub>e) and deforestation reductions (20-50 per cent), estimates for annual REDD revenues are at \$7-23 billion (El Lakany et al. 2007).

Cited from “Do trees grow on money?”

# Ex. Financial Scale of REDD in Indonesia

- Annual emission from deforestation in Indonesia is 3 billion tC/year.
- If Indonesia reduced 20 % of its emission from forests and the price of carbon is 5 USD/tC, Indonesia could receive 3 billion USD per year.

# Can trees grow on money?

- The key question then becomes:

Can finance of such magnitude catalyze forest protection in the interest of climate protection?

In other words, Can trees grow on money?

Cited from “Do trees grow on money?”

# Trees will not grow on money

- REDD schemes will not be effective, unless there are governance mechanisms to translate international financial assistance into meaningful change on the ground.
- International REDD funding will be important, but must be complemented by clear incentives and a strong commitment from the governments of the deforesting countries to undertake such reforms.

Cited from “Do trees grow on money?”

PDF file of “Do trees grown on money?” is available in English, Japanese, Spanish, Korean from

<http://www.cifor.cgiar.org/Knowledge/Publications/Detail?pid=2347>



## Do Trees Grow on Money?

The implications of deforestation research for policies to promote REDD

Markku Kanninen  
Daniel Murdiyarso  
Frances Seymour  
Arild Angelsen  
Sven Wunder  
Laura German



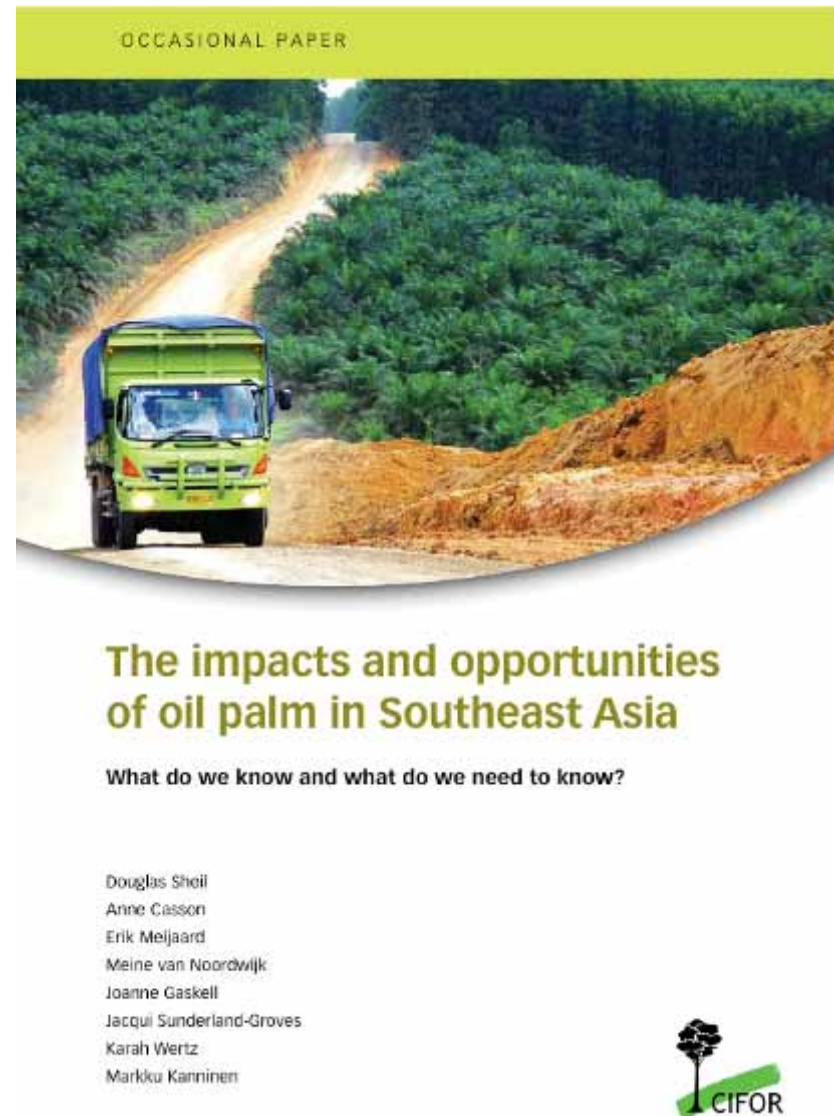
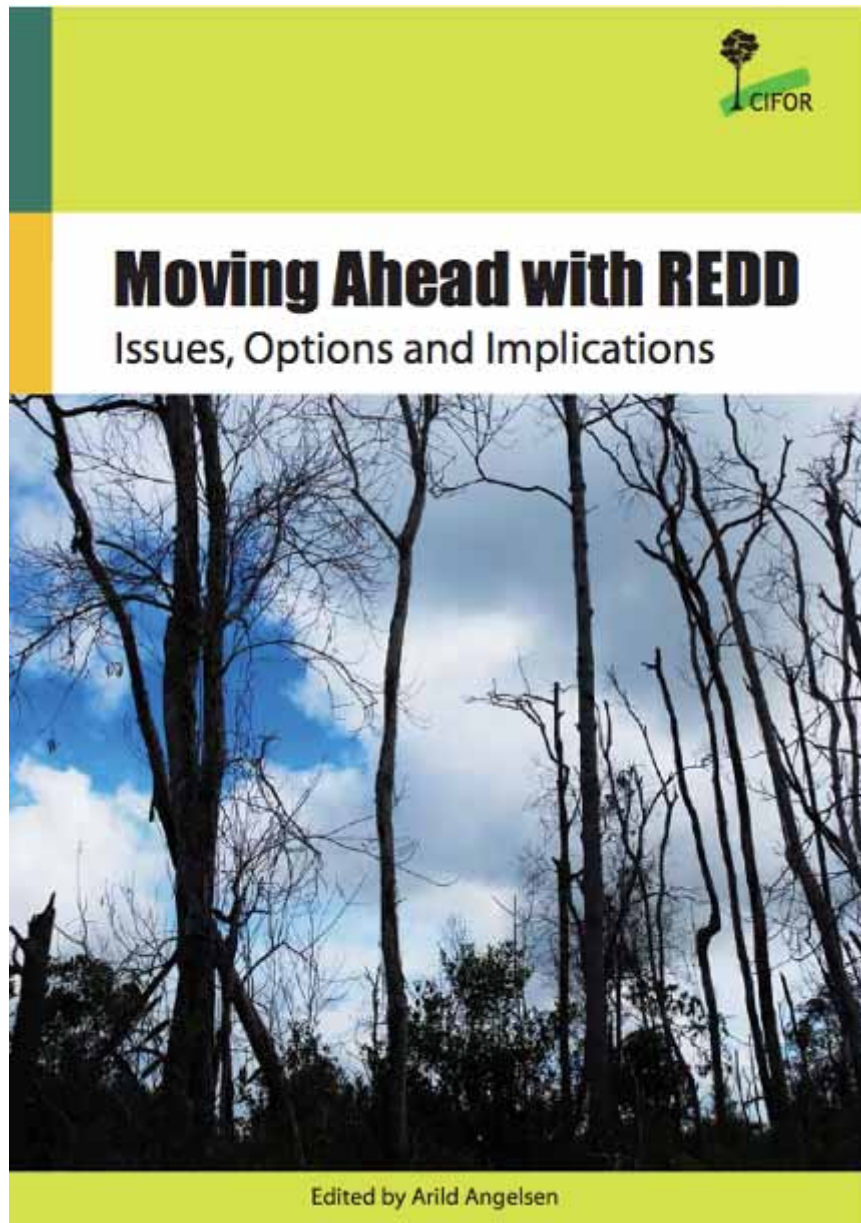
## 木はお金で育つか？

「森林減少と森林劣化に由来する排出削減(REDD)」  
に対する森林減少研究からの示唆

マルク・カンニネン  
ダニエル・ムルディアアルソ  
フランシス・セイモア  
アリッド・アンジェルソン  
スウェン・ワンダー  
ローラ・ジャーマン  
共著

藤間 剛  
鷹尾 元  
御田成顕  
岩永青史  
共訳

Books on REDD and Oil palm are also available at CIFOR website.



<http://www.cifor.cgiar.org/Publications/Detail?pid=2792>

<http://www.cifor.cgiar.org/Knowledge/Publications/Detail?pid=2601>