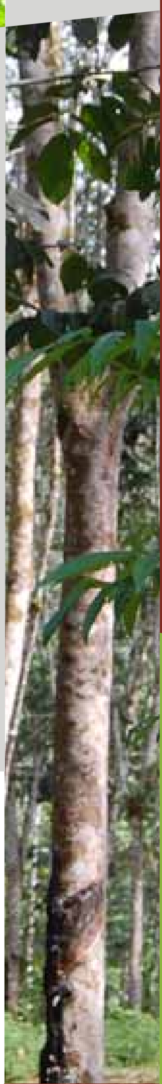

# AN ASSESSMENT OF OPPORTUNITIES FOR REDUCING EMISSIONS FROM ALL LAND USES
# **VIETNAM PREPARING FOR REDD**
## FINAL NATIONAL REPORT


*Hoang Minh Ha*
*Do Trong Hoan*
*Meine van Noordwijk*
*Pham Thu Thuy*
*Matilda Palm*

*To Xuan Phuc*
*Doan Diem*
*Nguyen Thanh Xuan*
*Hoang Thi Van Anh*



ASB Partnership for the Tropical Forest Margins

While the international community has embraced the Reducing Emissions from Deforestation and forest Degradation (REDD-plus), the role played by land outside the forest in storing carbon and reducing emissions, has not been sufficiently addressed.

The project, 'Architecture of REALU: Reducing Emissions from All Land Uses' pays specific attention to the interactions between forest carbon stocks, other carbon stocks affected by land use, the major drivers of land-use and forest change, and the livelihoods of the hundreds of millions of people whose actions shape these changes.

A broad-based approach to carbon management can lead to greater emissions reductions and larger benefits for local people.

This project is implemented by the ASB Partnership for the Tropical Forest Margins in collaboration with local and international research partners in eight countries: Indonesia, Philippines, China, Nepal, Vietnam, Cameroon, Peru and Tanzania.

ASB is the only global partnership devoted entirely to research on the tropical forest margins. ASB's goal is to raise the productivity and income of rural households in the humid tropics without increasing deforestation or undermining essential environmental services.

The research in Vietnam was conducted in collaboration with the World Agroforestry Centre. The World Agroforestry Centre generates science-based knowledge about the diverse roles trees play in agricultural landscapes and uses this research to advance policies and practises that benefit the poor and the ecosystems in which they live. It is one of 15 international research organizations that make up the Consultative Group on International Agricultural Research (CGIAR).

This work was funded by NORAD - the Norwegian Agency for Development Cooperation, but views expressed in this publication do not necessarily reflect views of the donor.

Cover images: Vietnamese maize farmer by mp3ief/flickr.com; Jungle rubber trees by V. Meadu, ASB

This page: Tree in Dak Nong province of Vietnam by ICRAF Vietnam

# Contributors

**Hoang Minh Ha Ph.D** (agroforestry and land-use expert)
World Agroforestry Centre (ICRAF), Vietnam
17T5 Trung Hoa - Nhan Chinh, Apartment 302, Cau Giay, Hanoi, Vietnam
*Email: m.h.hoang@cgiar.org*
Tel and Fax: + 84-4-6251 0830

**Do Trong Hoan M.Sc** (environmentalist)
World Agroforestry Centre (ICRAF),Vietnam
17T5 Trung Hoa - Nhan Chinh, Apartment 302, Cau Giay, Hanoi, Vietnam
*Email: hoanicraf@gmail.com*
Tel and Fax: + 84-4-6251 0830

**Pham Thu Thuy, Ph.D candidate** (environmentalist)
School for Environmental Research, Charles Darwin University, Australia
*Email: brissiesugar@gmail.com, pham.thu.thuy@cdu.edu.au*
Tel and Fax: +84-4-6251 0830

**Doan Diem, Nguyen Ngoc Lung, Ngo Dinh Tho (**foresters)
Sustainable Forest Management and Forest Certification Institute (SFMI)
Forestry Association of Vietnam
114 Hoang Quoc Viet street, Cau Giay district, Hanoi, Vietnam
*Email: lungnn@yahoo.com; ngodinh_tho@yahoo.com.vn; doandiem0142@gmail.com*
Tel: +84-4-3755 6250
Fax:+84-4-3755 6430

**Nguyen Thanh Xuan M.Sc** (GIS expert)
Remote Sensing and GIS Application Center
National Institute of Agricultural Planning and Projections (NIAPP)
Ministry of Agriculture and Rural Development (MARD)
61 Hang Chuoi, Hai Ba Trung, Hanoi, Vietnam
*Email: xuan.rsc.niapp@gmail.com*
Tel: +84-4-3821 4740

**Hoang Thi Van Anh M.Sc** (land administration expert)
Department of Land-Use Planning
General Department of Land Administration (GDLA)
Ministry of Environment and Natural Resources Management (MONRE)
No. 9/78 Giai phong street, Dong Da district, Hanoi, Vietnam
*Email: anhshq@yahoo.com*
Tel: +84-4-3629 0625
Fax: +84-4-3629 0210

**Matilda Palm Ph.D** (physical geographer)
University of Gothenburg
Earth Sciences Centre, Physical Geography
Box 460 SE-405 60 Gôteborg,Sweden
*Email: matilda@gvc.gu.se*
Tel: +46-31-773 19 57
Fax: +46-31-773 19 86

**Dr To Xuan Phuc** (anthropologist)
Forest Trends
*Email: pto@forest-trends.org*
Tel: +84-9 8826 6766

**Meine van Noordwijk Ph.D** (ecologist)
World Agroforestry Centre (ICRAF)
South East Asia Regional Program
Jl. CIFOR, Situgede, Sindang Barang, Bogor 16680
[PO Box 161, Bogor 16001] Indonesia
*Email: m.van-noordwijk@cgiar.org*
Tel : +62-251 625415
Fax : +62-251 625416

**David Thomas Ph.D** (policy analyst)
World Agroforestry Centre (ICRAF), Thailand
Chiang Mai University, Thailand
*Email: thomas2cm@gmail.com*

**Pham Thi Thuy Hanh M.Sc** (environmentalist)
Department of International Cooperation and Sciences, Technology (DICST)
General Department of Land Administration (GDLA)
Ministry of Environment and Natural Resources Management (MONRE)
No 9/78 Giai phong street, Dong Da District, Hanoi, Vietnam
*Email: phamthuyhanh30@gmail.com*
Tel: +84-4-3629 0203
Fax:+84-4-3629 0210

**Le Thi Thanh Xuan M.Sc** (land administrator)
Department of Registration and Statistics
General Department of Land Administration (GDLA)
Ministry of Environment and Natural Resources Management (MONRE)
No 9/78, Giai Phong street, Dong Da, HaNoi
*Email: xuan2004ln@yahoo.com*
Tel: 04-36290208
Fax: 04-36290210

**Pham Minh Thoa, Ph.D candidate** (forestry policy expert)
International Cooperation, Science and Technology Department
General Department of Forestry (GDOF)
Ministry of Agriculture and Rural Development (MARD)
B9, 2 Ngoc Ha, Ba Dinh, Hanoi, Vietnam
*Email: mthoa-dfd@netnam.vn; or thoapm.ln@mard.gov.vn*
Tel: + 84-4-3733 2263
Fax: + 84-4-3843 8793

**Tran Thi Thu Ha M.Sc** (economist)
Research Centre for Forest Ecology and Environment (RCFEE)
Dong Ngac, Tu Liem, Hanoi, Vietnam
*Email: ha.tt@rcfee.org.vn*
Tel: +84-4-3755 0801
Fax: +84-4-3838 7434

**Nguyen Tuan Anh M.Sc** (economist)
Environmental and Resources Centre
National Institute of Agricultural Planning and Projections (NIAPP)
Ministry of Agriculture and Rural Development (MARD)
61 Hang Chuoi, Hai Ba Trung, Hanoi, Vietnam
*Email: huytuananhniapp@yahoo.com.vn*
Tel: +84-4-3821 4714

# Table of Contents

# List of Figures

# List of Tables

# Abbreviations

| | |
|---|---|
| AFOLU | Agriculture, Forestry and Other Land Uses |
| ASB | Alternatives to Slash and Burn Partnership for the Tropical Forest Margins |
| BAU | Business as usual |
| C | Carbon |
| CBD | Convention on Biological Diversity |
| CDM | Clean Development Mechanism defined in the Kyoto Protocol (1997) |
| CER | Certified Emission Reduction |
| CIFOR | Center for International Forestry Research |
| $CO_2eq$ | Carbon dioxide equivalent |
| COP | Conference of Parties to United Nations Framework Convention on Climate Change |
| DARD | Department of Agriculture and Rural Development at province level, Vietnam |
| DONRE | Department of Natural Resources and Environment at province level, Vietnam |
| EU | European Union |
| FPD | Former Forest Protection Department, now merged into General Department of Forestry under Ministry of Agriculture and Rural Development of Vietnam |
| FAO | Food and Agriculture Organization of the United Nations |
| FCPF | Forest Carbon Partnership Facility (World Bank) |
| FLEG | Forest Law Enforcement and Governance (World Bank) |
| FLEGT | Forest Law Enforcement, Governance and Trade Program (EU) |

| | |
|---|---|
| FIPI | Forest Inventory and Planning Institute under the Ministry of Agriculture and Rural Development of Vietnam |
| FPDL | Forest Protection and Development Law of Vietnam |
| FSIV | Forest Science Institute of Vietnam |
| GAMA | Globally Appropriate Mitigation Action |
| GDLA | General Department of Land Administration under the Ministry of Natural Resources and Environment of Vietnam |
| GDOF | General Department of Forestry under the Ministry of Agriculture and Rural Development of Vietnam |
| GHG | Greenhouse Gas |
| GIS | Geographic Information System |
| GTZ | German Organisation for Technical Cooperation |
| Ha | Hectare |
| IPCC | Intergovernmental Panel on Climate Change |
| ICRAF | World Agroforestry Centre |
| JICA | Japan International Cooperation Agency |
| KP | Kyoto Protocol |
| LU | Land use |
| LUC | Land use change |
| LULUCF | Land use, land-use change and forestry |
| MARD | Ministry of Agriculture and Rural Development of Vietnam |
| MONRE | Ministry of Natural Resources and Environment of Vietnam |
| MRV | Monitoring, Reporting, Verification |
| NAMA | Nationally Appropriate Mitigation Actions |
| NFIMAP | National Forest Inventory, Monitoring and Assessment Program |
| NIAPP | National Institute of Agricultural Planning and Projection |
| NORAD | Norwegian Agency for Development Cooperation |
| NP | National Park |
| NPV | Net Present Value |
| NTFP | Non-timber Forest Product |
| OPCOST | Opportunity Cost Model developed by ASB-ICRAF |
| PC | People’s Committee |
| PES | Payment for Environmental Services |

| | |
|---|---|
| PFES | Payment for Forest Environmental Services |
| RACSA | Rapid Carbon Stock Appraisal |
| RCFEE | Research Centre for Forest Ecology and Environment under Forest Science Institute of Vietnam |
| REALU | Reducing Emissions from All Land Uses |
| REDD | Reducing Emissions from Deforestation and Degradation |
| RECOFTC | The Center for People and Forests |
| REDD-ALERT | Reducing Emissions from Deforestation and Degradation through Alternative Land-uses in Rainforests of the Tropics |
| REL | Reference Emission Level |
| R-PINs | Readiness-Project Idea Notes |
| SFEs | State Forest Enterprises |
| SFM | Sustainable Forest Management |
| SFMI | Research Institute for Sustainable Forest Management and Forest Certification, Vietnam |
| LM | Sustainable Land Use Management |
| SNV | Netherlands Development Organisation |
| SOC | State-owned Company |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UN-REDD | United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in developing countries |
| USD | United States Dollar |
| USDA | United States Development Agency |
| VND | Vietnamese Dong |
| VPA | Voluntery Partnership Agreements |

# Glossary

**Abatement cost:** costs (usually presented in USD per $tCO_2eq$) of effectively reducing emissions, generally considered to consist of ***opportunity costs*** (offsetting economic benefits foregone of legal land-use options that would cause emissions: see OPCOST), direct ***protection costs*** and ***implementation/ transaction costs***.

**Additionality:** Environmental benefits (for example, net emission reduction) achieved beyond what would have been expected under a ‹business as usual› scenario, in the absence of specific interventions. Projects under the Clean Development Mechanisms of the Kyoto Protocol must provide evidence of what would have occurred without the project.

**Baseline:** See Reference Emission Level.

**Business as usual (BAU):** Expectations of how the current set of drivers will interact to influence future emissions in the absence of specific interventions or external shocks.

**Carbon rights:** A bundle of rights that refers to the sequence of steps needed to negotiate a baseline, reduce actual carbon emissions below an agreed baseline, measure, report and verify the emission levels, claim control of leakage, issue 'credits' within an agreed set of rules and 'sell' these credits on a market to buyers who may or may not have the right to use them to offset ongoing emissions. Part of the carbon rights can be linked to land tenure; other parts refer to management roles and responsibilities in a wider landscape. Legal institutions for carbon rights are in an early stage of development outside of the Annex I countries that have a nationally agreed baseline of emissions across all sectors.

**Carbon stock (C-stock):** The quantity of carbon stored or contained in one of more ‹pools› (usually separated into above- and belowground and biomass and necromass).

**Certified Emission Reduction (CER):** The technical term for the output of Clean Development Mechanism projects. A CER is a unit of greenhouse gas reduction that has been planned, generated and certified under the provisions of Article 12 of the Kyoto Protocol, the Clean Development Mechanism. One CER equals one ton of carbon dioxide (and thus 0.27 ton of carbon). Two special types of CERs can be issued for net emission removals from afforestation and reforestation Clean Development Mechanism projects: (i) temporary certified emission reduction (tCERs); and (ii) long-term certified emission reductions (lCERs).

**Co-benefits.** Benefits arising from REDD schemes beyond the reduction of net greenhouse gas emissions, such as, potentially, reduction of rural poverty, protection of biodiversity and other environmental services, improvement of forest governance and protection of human rights (all with their respective baselines and ways of assessing additionality).

**Deforestation:** Long-term conversion of land from forest to non-forest (see ‹forest› definition). In an annex to a decision made by the UNFCCC Conference of Parties (COP), which serves as a meeting of the parties to the Kyoto Protocol, deforestation is defined as “the direct human-induced conversion of forested land to non-forested land”. The Food and Agriculture Organization (FAO) defines deforestation as “the conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10% threshold”.

**Degradation:** Changes within the forest which negatively affect the structure or function of the forest stand or site and thereby lower the capacity of the forest to supply products and/or services. In the context of a REDD mechanism, forest degradation results in the net loss of carbon from the ecosystem. One way to measure degradation is to measure the decrease in the carbon stock per area unit (for example, hectare).

**Forest:** Woody vegetation that meets objectively verifiable characteristics of current tree crown cover over minimum areas, ***or*** an inferred intention of reaching such minimum standards on “temporarily unstocked” lands ***and*** absence of agricultural or urban management targets. Under the forest definition accepted in the Kyoto Protocol, countries are required to specify minimum crown cover (any value between 10 and 30%), minimum (potential *in situ*) and tree height (any value between 2 and 5m), with a minimum area of 0.5 ha. The Food and Agriculture Organization has, in addition, excluded woody vegetation on land where “agriculture” is a dominant use, creating ranges of interpretation where “tree crops” are involved that provide domesticated “non-timber forest products”, as opposed to “timber” in fastwood plantations. As both “deforestation” and “forest degradation” hinge on the operational forest definition, the multiple interpretations make comparison of data sources difficult. International REDD negotiators have so far refrained from addressing the issue.

**GAMA:** Globally Appropriate Mitigation Action or the sum total of commitments to national mitigation action, with appropriateness measured against the targets of avoiding dangerous anthropogenic climate change (for example, staying below the 2°C warming threshold).

**Greenhouse Gasses (GHG):** gasses that contribute more to the retention in the atmosphere of the energy of heat wave radiation from the earth than they contribute to the reflection of incoming solar radiation (there are also “cooling gasses” with an opposite effect); originating from land-use change are mainly $CO_2$ (carbon dioxide), methane ($CH_4$) and nitrous oxide ($N_2O$).

**LAAMA:** Locally Appropriate Adaptation and Mitigation Actions or the reference emission levels accepted by a subnational entity to simultaneously adapt to ongoing and expected climate change and contribute to NAMA targets.

**Leakage**: Increase in net emissions beyond project boundaries that can be causally attributed to the efforts to reduce net emissions within a specified project boundary. In the context of REDD, leakage is also referred to as “emissions displacement” or “driver deflection”. Leakage estimates are used to reduce the credits for emission reduction below the level of “additionality”. The causal attribution is subject to debate. Cross-border leakage (for example, from Annex I to non-Annex I countries, or by displacement of logging to other countries) is a major concern that can only be addressed if the vast majority of potential emitters subscribes and adheres to consistent accounting rules.

**Liability**: Obligation of a REDD-implementing subnational “project” or country to ensure that the emission reductions that have been credited are permanent or will be replaced by other credit sources.

**NAMA:** Nationally Appropriate Mitigation Action or the reference emission level accepted by a country as performance standard in international negotiations.

**Net present value (NPV):** Sum of expected future benefits (for example, volume*price of products sold) minus costs (for example, labour, planting materials, inputs), with net cash flows discounted at a rate that reflects the costs of borrowing for a land user. NPV is usually expressed as “$ per ha” and can be calculated at private (individual land user) and social (value and costs to society) level, to analyze the net effect of current policies on profitability. NPV is usually calculated using current wage rates of labour, attributing the net benefit to the land owner; alternatively, net benefits can be attributed to labour in a “return to labour” format that changes wage rates until NPV equals zero.

**MRV:** Monitoring, Reporting, Verification.

**OPCOST** is a model to investigate the opportunity cost of reducing $CO_2$ emissions from change in land use, derived from the ratio of the difference in NPV and the difference in carbon stocks of land use that was observed for a certain period in a defined geographic domain. The spreadsheet model was developed by ASB-ICRAF on request of the Forest Carbon Partnership Facility (FCPF) of the World Bank.

**Permanence**: Non-reversibility of net reduction in greenhouse gas emissions, based on duration of protected carbon stocks and/or obligations to offset future reductions in carbon stock through net emission reduction elsewhere. At national scale, permanence is handled by consistency of accounting for carbon stocks and reference emission levels.

**RED** (EU): Renewable Energy Directive, specifying targets for biofuel use and specifying maximum standards for C footprint per unit fossil fuel emission offset.

**RED** (UNFCCC): Reducing emissions from (gross) deforestation. Only changes from "forest" to "non-forest" land-cover types are included; details very dependent on the operational definition of "forest".

**REDD**: RED combined with (forest) degradation or shifts to lower carbon stock densities ***within*** the forest; details very dependent on the operational definition of "forest".

**REDD+**: REDD combined with restocking within and towards "forest" (as specified in Bali Action Plan); some REDD+ versions include peatlands regardless of their forest status; details still dependent on the operational definition of "forest".

**REDD++:** = REALU = REDD+ combined with all transitions in land cover that affect carbon storage, whether peatland or mineral soil, trees-outside-forest, agroforests, plantations or natural forest. Details are *not* dependent on the operational definition of "forest".

**Reference emission level (REL):** Baseline or reference line indicates the expected level of emissions in the absence of specific interventions, that is, used to measure additionality. Operationally it can refer to three concepts (i) a historical baseline, based on extrapolation of historic trends in $CO_2$ emissions, generally without considering non-linearity of forest transition curves; (ii) the projected emissions from deforestation and degradation under a business-as-usual scenario of currently known "drivers"; and (iii) a negotiated emission level to which authorities commit and take on responsibility to achieve by influencing the various drivers.

# Acknowledgements

The authors are grateful to the NORAD-funded REALU project of the Alternative to Slash and Burn (ASB) partnership at the World Agroforestry Centre (ICRAF) for funding and guidance in this study. We wish to thank all stakeholders involved at two national workshops, particular Mr Nguyen Khac Hieu, Deputy Director of Department of Meteorology, Hydrology and Climate Change of Ministry of Natural Resources and Environment (MONRE); Ms Tran Thi Minh Ha and Mr Nguyen Xuan Bao Tam of Department of International Cooperation of MONRE; Dr Pham Manh Cuong at GDOF of MARD; Mr Dao Trung Chinh, Deputy Director General, and Ms Nguyen Thi Thu Hong, Deputy Director, of Department of Interational Cooperation and Science and Technology of GDLA of MONRE; Mr Tim Holland and Mr Richard McNally of SNV in Vietnam; Professor Bao Huy of Tay Nguyen University; and Ms Vu Thi Hien (Centre of Research and Development in Upland Areas (CERDA)), whose perspectives and comments are included in this report.

We also wish to thank all stakeholders involved in the mini-workshop in Dak Nong province, who participated in the work reported in this paper, particularly Mr Truong Van Hien, Director, and Ms Hoang Thi Kim Dung, Deputy Director, of DONRE of Dak Nong province. We also gratefully acknowledge the very useful guidance and interaction with Dr Peter Akong Minang, ASB Coordinator, on structuring this working paper. This study received full support from Ms Thea Ottmann, First Secretary, and Mr Vu Minh Duc, Development Advisor, of the Norwegian Embassy in Vietnam.

**Chapter 1**, introduction, was compiled by Hoang Minh Ha, Meine van Noordwijk and Pham Thu Thuy.

**Chapter 2**, on background, concepts and the Vietnamese context in the debate was compiled by Meine van Noordwijk, Hoang Minh Ha, and Pham Thu Thuy.

**Chapter 3**, on leakages, was written by To Xuan Phuc and Pham Thu Thuy. This section greatly benefited from open and fruitful discussions with Pham Minh Thoa (MARD), Hoang Minh Ha, Meine Van Noordwijk (ICRAF), Sheila Wertz (CIFOR), Bruce Campbell (CGIAR Global Program on climate change and food security), Stephen Gartnett and Andrea Babon (Charles Darwin University).

**Chapter 4**, Section 4.1 on the national review of drivers of deforestation and degradation, was compiled by Hoang Minh Ha, Do Trong Hoan, Doan Diem and Matilda Palm.

**Chapter 4**, Section 4.2, Dak Nong case study, was written by Do Trong Hoan, Nguyen Thanh Xuan, Hoang Minh Ha, Matilda Palm and Hoang Thi Van Anh. Data analysis of land administration data was assisted by GDLA at MONRE; remote sensing image-processing data provided by NIAPP, MARD; forest land classification report by Research Institute for Sustainable Forest Management and Forest Certification (SFMI), modelling OPCOST provided by ICRAF-ASB; Net Present Value (NPV) of rubber provided by Vietnam Rubber Association and of coffee and cashew by NIAPP; NPV of forest types provided by RCFEE of FSIV; Carbon-stock value of different forest categories provided by Tay Nguyen University and RCFEE of FSIV; as well as perspectives on drivers of forest land conversion from the mini-workshop in Dak Nong.

**Chapter 5**, on rights, resources access and tenure, was first compiled by Hoang Minh Ha, David Thomas and Pham Thu Thuy based on the three individual reports of Nguyen Ngoc Lung, Doan Diem and Vu Thi Hien, who were employed in this REALU project. It then received significant and valuable inputs from To Xuan Phuc before being finalised by Pham Thu Thuy.

**Chapter 6**, on REDD analysis framework, is compiled by Do Trong Hoan, Pham Thu Thuy and Hoang Minh Ha on the findings of group discussions at the two national consultation workshops.

**Chapter 7**, discussions and conclusions, is compiled from all chapters by the whole team.

Dr David Thomas, Dr Hoang Minh Ha, Dr Meine van Noordwijk and Ms Pham Minh Thoa were the reviewers and editors of this report. Mr Robert Finlayson, Research Communications Specialist of the World Agroforestry Centre (ICRAF) Southeast Asia was the language editor English of this report.

# Executive Summary

Land use, land-use change and forestry, especially deforestation and degradation in the tropics, contribute approximately 17-20% of total global greenhouse gas emissions. Because the direct benefits that land managers obtain from changing high carbon-stock land use to lower carbon-stock uses are often small relative to the global impact on net emissions, it has been suggested that the international community compensate land managers for the relatively low ‹opportunity cost› of *not* clearing forests for agriculture or other land uses.

Part of the conversion and emissions will clearly be out of reach of economic incentive structures and a target of ‘reducing’ rather than ‘ending’ emissions is appropriate. This, in principle, is the reason behind global interest in the so-called Reducing Emissions from Deforestation and Forest Degradation (REDD) mechanisms. Vietnam has been selected as a test-case country by many donors. The United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) and the World Bank’s Forest Carbon Partnership Facility (FCPF) are the most important donors.

The test case is conducted to ensure that rich experiences and lessons learned will be incorporated in the REDD design and also to investigate how REDD might operate in developing countries. Vietnam is, given its long coast line and already pressured natural resources, one of the most vulnerable countries to climate change. Furthermore, Vietnam is an interesting case for investigation owing to its rare trend of increasing forest cover, which makes Vietnam one of the few tropical countries on the right side of the forest transition curve.

The per capita emissions in Vietnam are only one third of the global average emission per person (1.2 $tCO_2eq$/year compared to global average of 4.5 $tCO_2eq$/year), however, owing to rapid economic development emission from Vietnam is increasing sharply compared with the rest of the world (6.7% between 1995 and 2000 compared to 10.6% between 2000 and 2005).

Identifying the Nationally Appropriate Mitigation Action (NAMA) may inspire initiatives from the Vietnamese government for appropriate methods and levels of emission reduction.

**REDD perspective in Vietnam**

Even though a performance-based approach and carbon markets are still new in the forestry sector in Vietnam, it is clear that the Vietnamese government emphasises REDD and REDD+. This is because the current forest policies aim to enhance sustainable forest management, biodiversity conservation and forest carbon stock. REDD and REDD+ fit well within current environmental and socio-economic development strategies. However, it is important to ensure the recognition of other crucial issues embodied in REDD, such as permanence, leakages, linkages between MVR with benefit sharing, rights and obligations of land users at subnational, national and regional levels. In order to do so, it is important for the country to take a cross-sector approach in implementing REDD.

The REALU (Reducing Emissions From All Land Uses) project provides such an approach, with global implications from a country case. REALU is essentially REDD++, including all land uses, and is not limited to the definition of forest alone. During the second national REALU workshop, a cross-sectoral approach, including the full landscape to be used for emission reductions, was discussed as well as the possibility of applying such an approach to favourable Vietnamese conditions.

The preparations for COP 15 as well as the REALU Vietnam national workshop after COP 15 showed an increasing interest in new ways to achieve landscape-level emission reduction plus livelihood enhancement. One option to achieve this is the combination of forest protection and good cross-sectoral land-use planning to balance emission reductions and the livelihoods of local stakeholders in any land conversion from forest to other land uses. Climate change adaptation can also be included in such land-use plans.

Analysis of the REALU approach shows that REDD or REDD+ cannot be addressed by the forestry sector alone, but it should be seen as one instrument for sustainable development, where economic growth, environmental protection with a focus on natural forest protection, and poverty reduction go hand in hand. Benefits (as in REDD-related financial flows) to governments could be tied to national commitments to cease commercial deforestation and to restructure logging, pulp and paper and other industries, possibly over a number of years. It could also be useful to focus on developing transition funds that would help developing countries match lost tax revenue streams, jobs and value-added industries. This approach could provide the necessary positive incentives to governments considering changing their policies on deforestation, but would be additional to the costs associated with tackling the underlying causes of deforestation.

**Economic development and leakage across areas and sectors**

Regional and national leakage pose great challenges for REDD implementation in Vietnam. The study finds that while Vietnam is blamed for causing deforestation in other countries, the issue is more complex than what has been claimed. It depends on the definition of illegal logging, regional policies that countries could adopt and the governance and institutional structures of the countries.

There are several commitments by Vietnam and its neighbouring countries to act jointly to control illegal logging and leakage, such as the EU action plan, Forest Law Enforcement, Governance and Trade (FLEGT). These efforts provide incentives for enhanced regional cooperation to reduce leakage. The action plan is based on Voluntary Partnership Agreements (VPA) between timber-producing countries and the EU to follow legal verification systems which will be instigated in producer countries to ensure that only legal timber enters the EU market. This report suggests that a common definition of illegal logging should be promoted amongst developing countries and better law enforcement on borders should be enacted.

National leakage in Vietnam is mainly driven by illegal logging or poor cross-sectoral land-use planning. Therefore, careful analysis of long-term land-use planning should be conducted before any policies and strategies are carried out.

Careful analysis of transaction costs for implementing a REDD mechanism and leakages should be conducted to assess the viability and sustainability of the schemes. One way to address REDD efficiency is through linking REDD efforts with regular national activities on sustainable natural resources management and sustainable rural development. The goal of REDD is not really new and it aligns with many public policy goals; the challenge is to ensure that additional funding streams synergize with existing efforts to jointly tip the balance towards reconciling development and environmental goals.

**Drivers of land-use change, emission and incentive structure**

Vietnam has a proven track record in increasing the amount of forest cover, which makes it one of the few tropical countries to the right on the forest transition curve. Despite the fact that total forest cover increased since 1997, the last decade still saw an alarming degradation of natural forest, continuing the trend since the 1940s. Given that carbon stocks in diverse, natural forest are estimated to be 5-10 times higher than those in planted forest, the increase in forest area alone cannot ensure the expected emission reduction.

Even though REALU does not depend on the ‹forest› definition in itself, it requires a common land-use classification. When it comes to forest and land-use related issues, Vietnam relies on two ministries, MARD and MONRE, both of which use different terminology and land-use classifications. Analysis shows that these different systems have large inconsistencies in land-use classification. Differences in the legends of land-use classification have led to inconsistencies in the available forest data. Not only does Vietnam face difficulties with insufficient and unreliable data that will create complications for the application of a REDD framework, the existing land-use classification system is failing the purpose of implementing both REDD and a full landscape approach by not being consistent.

The analysis shows large gaps when comparing planning and ‹real› land-use change. The case study in Dak Nong (in the Highland Plateau of Vietnam) confirms that the main direct driver of deforestation and degradation in Vietnam is the conversion of natural forest to industrial perennial crops and shifting cultivation. This case demonstrates that the cause of land-use change was insufficient and inadequate land-use planning and, consequently, poor land-use management. These factors combined with others such as high financial revenues from perennial crops, rapid and large immigration, and unclear land-tenure rules.

Findings from an opportunity cost analysis in Dak Nong showed that only about 20% of emissions was linked to economic benefits exceeding 5 \$/t$CO_2$eq; the major part of emissions should be "in reach" of economic incentives to offset opportunity costs. This tool is very useful for narrowing the gap between plans and "real" land-use changes, particularly when REDD mechanisms are considered income-generating activity that offsets opportunity costs of legal land-use change.

**Rights, resource access and tenure**

Indigenous people and their land management practices should be respected and integrated whenever and wherever necessary to ensure successful REDD implementation. The involvement of indigenous people in national programs in general and in REDD in particular is limited. A study focusing on rights of resource access suggested that there is a need for formal and regular communication and feedback mechanisms for indigenous people to express their opinions and concern over development planning, including REDD. The role of local organisations and civil society groups should be enhanced so that these groups can act as watchdogs during REDD implementation. Benefit sharing should go together with planning and action, and monitoring, reporting and verifying (MRV).

In Vietnam, there are eight different legal categories of land users. Data show that forest protection is driven by companies and is government orientated, with only a small fraction of the forest land managed by households. However, further analysis shows that both the state management boards and the forest enterprises are allocating the management and protection of forests to communities and households (except for special-use forests where the caretakers are the state forest management board). This indicates a risk of REDD funds being retained at government and corporate level and restricting any money from reaching the actual managers of the forest. This also implies that the involvement of households in planning activities, monitoring, reporting and verifying, and receiving and managing rewards would be necessary for the long-term effectiveness of REDD+.

To be able to cut transaction costs, the level of compensation for REDD activities should be on a national scale with the proper amount of liability. Within the country itself, the forest-management bodies that will handle compensation can either be already existing institutions such as the people's committees in the province, district or commune or newly created forest management boards with representatives of all land users. However, the important conclusion is that compensation at village or household level should neither be (fully) based on performance nor should it be a reflection of the involvement of each household but rather a full landscape approach (REALU) should apply with a bottom line at landscape and community levels. This means that as long as emissions are kept below the REL for an administrative area, that is, the management boards, compensation should be distributed through a fair and efficient scheme.

**Possibility of applying a landscape approach in Vietnam**

The case study in Dak Nong showed the strong possibility of applying a landscape approach in Vietnam at the subnational level. The methods and tools developed (which will be further refined) for a landscape approach to emission reductions, include a uniform national land-use classification system, analysing long-term land-use change trends in order to define drivers of deforestation and degradation, and conducting opportunity cost analyses for various existing land-use changes and scenarios. The package of tools will be then used for negotiating the development of cross-sectoral land-use planning so that the REDD goal is mainstreamed into other socio-economic development plans for a region or a province. Cross-sectoral land-use planning also facilitates cross-sectoral links in REDD implementation that help to reduce national/regional leakage by embracing REDD, forest protection and high carbon stock/low carbon emission development pathways. Equitable involvement of land users, including government, private companies and smallholders in the land-use planning process provides the basis for a “co-governance” approach, as suggested in this report, in order to plan REDD actions, including participatory benefit sharing and MRV. This report recommends that this “co-governance” approach should be seen as a part of the REDD+ test case in Vietnam.

# Chapter I
# **Introduction**

Land use, land-use change, and forestry (LULUCF), and especially tropical deforestation, contributes approximately 17-20% of total greenhouse gas emissions. A practical solution might be to compensate land managers who would otherwise change their land use from high carbon stock to lower ones, for example, not clearing forests for agriculture.

This, in principle, is the rationale underlying the so-called Reducing Emissions from Deforestation and Forest Degradation (REDD) mechanisms. REDD primarily refers to: (i) developing mechanisms to make payments to developing countries for reducing emissions from deforestation and forest degradation (relative to a reference level); and (ii) readiness activities that prepare countries for participation in the REDD mechanism (Angelsen 2008, Wertz-Kanounnikoff and Kongphan-Apirak 2008). Thus, one of the core issues in REDD is how to create a multi-level (international and national) 'payments for environmental services' (PES) scheme (Angelsen 2008).

Although the underlying idea of REDD is simple and its mechanism is expected to deliver large cuts in emissions at a low cost within a short timeframe while also helping to alleviate poverty, there are various complex issues that still need to be solved, such as its measurement, scale, funding, permanence, liability, leakage and emission reference levels (Angelsen 2008). Two key strategic concerns for REDD in Vietnam are (i) whether to include REDD in an overall framework for the forest sector; and (ii) how to respond to the option to include forestry in an overall framework of Agriculture, Forestry and Other Land Uses (AFOLU) (Angelsen 2008). The expansion implied by AFOLU has raised scores of policy-related questions that bleed into issues of methodology: questions such as whether all offset proposals regarding land-use change should be included in the REDD category.

In order to help address this uncertainty, the REALU (Reduce Emissions from All Land Uses) project was designed to link knowledge with action by: (i) providing analyses of key cross-sectoral linkages in the tropical forest margins, based on long-term engagement in Asia, Africa and Latin America; (ii) organising multistakeholder events to explore implications for the design of an effective regime in the post-2012 context; and (iii) building the scientific and political basis for change through communicating and networking activities. The project is expected to strengthen the abilities of developing countries in developing and implementing effective strategies for REDD within a context of rural development, national sovereignty, respect for indigenous rights and the integrity of a global greenhouse gas accounting system. Work has been conducted in four focal countries where ASB-ICRAF are currently engaged, including (but not limited to) Indonesia, Cameroon, Vietnam, Peru, Brazil, Southwest China, Uganda, Tanzania, Lao PDR, Nepal, Madagascar and Zambia.

This working paper is an output of REALU activities in Vietnam, that is focused on REDD development and implementation in the country. The report consists of six chapters and each chapter unfolds discussions of key factors that influence the potential success of REDD in Vietnam.

### 1.1 STRUCTURE OF THIS REPORT

In this report we will follow the scale relations of REDD+ issues. Chapter 2 will relate the current negotiations and agreements that link the global economy, global carbon balance, trade and climate, to the role of Vietnam, as part of mainland Southeast Asia, Asia at large and the global tropical forests.

Chapter 3 will zoom in on the situation in Vietnam and its economic development and land-use plans that describe the relations between sectors of the economy across parts of the country and effectively define the “emission plans” through planned conversion of land use.

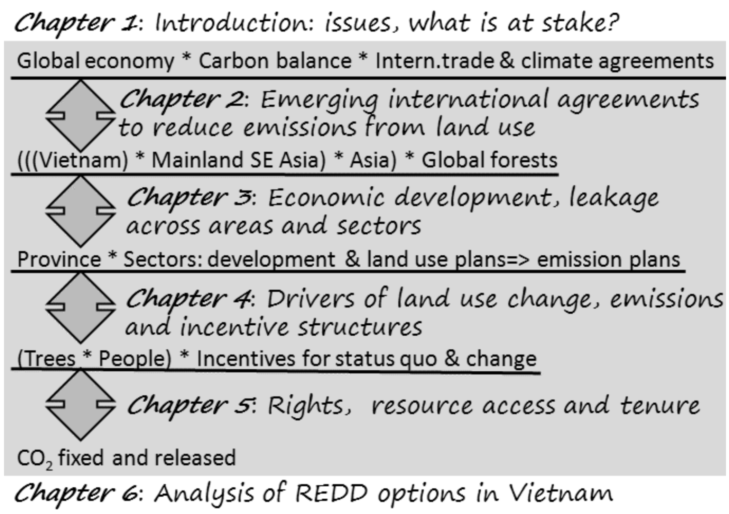


*Figure 1.1 Structure of the report*

In Chapter 4 we will drill down further and look at a case study of a specific part of Vietnam and the way the various drivers of land-use change at the forest margin interact and lead to change in carbon stocks under current incentive structures. This involves analysis of the economic gains linked to recent emissions that can be interpreted as "opportunity costs" for influencing future change. Opportunity costs are part of the overall abatement costs: costs to actively and actually change the emissions.

In Chapter 5 a further step is taken to relate these patterns of land-use change to the trees and people level of decision making, where tenure, rights of resource access and "free and prior informed consent" (FPIC) matter.

In Chapter 6 we zoom out again to the broader picture of REDD+/REALU for Vietnam as a whole.

### 1.2 REALU VIETNAM: ACTIVITIES

The REALU Vietnam study was designed to equip the REDD national network of Vietnam with sufficient information to support the 'REDD readiness' of Vietnam as well as for a global comparative analysis on the possibility of a landscape approach for REDD. The REALU Vietnam study included two periods. The first was undertaken September-December 2009. The initial findings were incorporated into a draft report, the policy brief named *Reduce Emission from All Land Uses (REALU): What will Vietnam's path be?*, presented at COP 15, as well as serving as the basis for planning the second study period. The second period, conducted March-May 2010, delved deeper into a survey on drivers of land-use conversion at subnational level in Dak Nong province and used the findings for testing running the OPCOST model. The findings were incorporated into this final report during May 2010.

The REALU study process is illustrated in Figure 1.1. It involved a group of key international and national experts in the field of land use, remote sensing, GIS, forestry, environment, anthropology, policy and modelling in Vietnam, Thailand and Indonesia. The study also benefitted from very fruitful discussions amongst key national stakeholders including NGOs, government agencies and donors (25 participants, Appendix 1) who attended the first project Consultation Workshop on Reducing Emissions from All Land Uses held in Hanoi on 4 November, 2009; the second consultation workshop (74 participants, Appendix 2) held in Tam Dao on 26 April, 2010; and the mini-workshop held Dak Nong province on 14 April, 2010 (31 participants, Appendix 3). The workshops were organised and funded by the REALU project to help develop a common understanding of the REALU concept and to discuss findings by the REALU Vietnam team on analysis, strategy and policy development for REDD in relation to agriculture and other land uses in Vietnam landscapes.

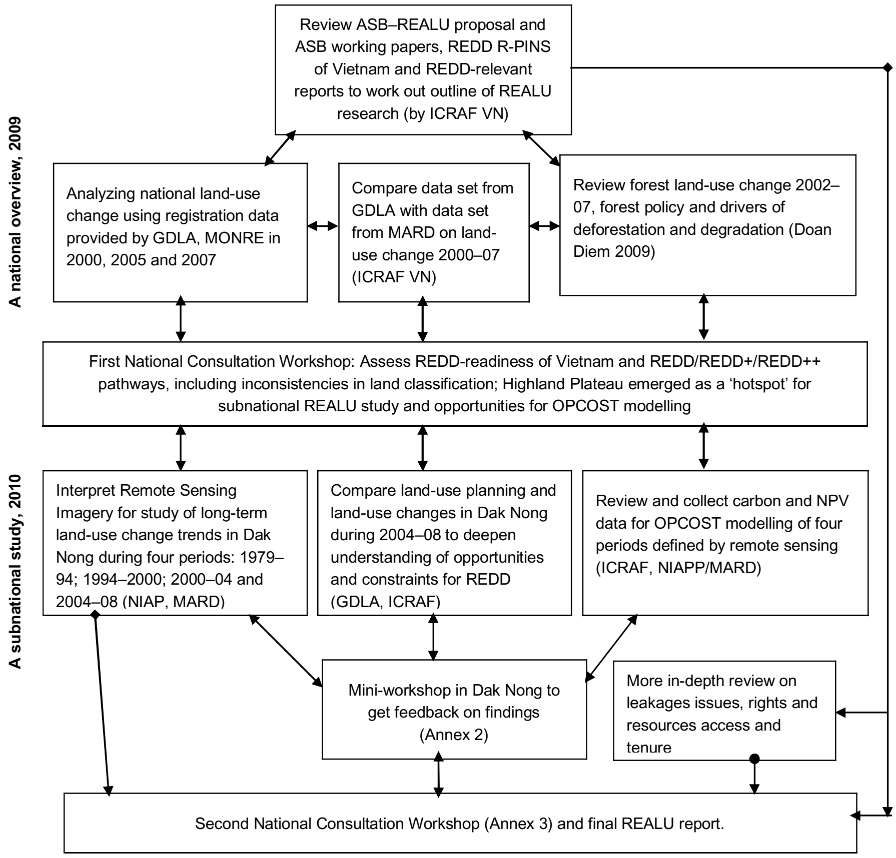


*Figure 1.2 REALU research process and outputs*

# Chapter 2

# Emerging international agreements to reduce emissions from land use: REDD background, concepts and Vietnam context

## 2.1. REDD BACKGROUND AND CONCEPTS

The REDD+ debate originated in the perception that current emissions from forest change in developing countries are higher than what is justified by development imperatives. The global interest in mitigating climate change and reducing net emissions, however, will have to translate to incentives for change on the ground (Figure 2.1). The question whether or not current forest cover is too low and rates of forest conversion too high may get different answers according to the scale and stakeholders considered. The methods and conditions under which REDD+ incentives can effectively shift the "drivers" requires further analysis, as well as the question of whether drivers will be "deflected" (seeking the next easy target) or "reduced".

The Kyoto Protocol addressed all emissions of industrialised (Annex I) countries and agreed on very modest emission reductions for 2008-2012 relative to the 1990 levels; a small part of this emission reduction could be achieved by investment in clean technology in developing countries (Clean Development Mechanism or CDM), plus afforestation/reforestation (A/R-CDM), under conditions that were so strict that very few projects and countries have so far been able to deal with them. The 2007 Bali COP 13 put REDD (and lack of sustainable forest management or SFM) on the map as an additional approach to emission reduction, expanding on the scope of CDM, with the expectation that COP 15 in Copenhagen in 2009 would agree to a set of more stringent emission reduction targets, alongside a more comprehensive approach to current emissions.

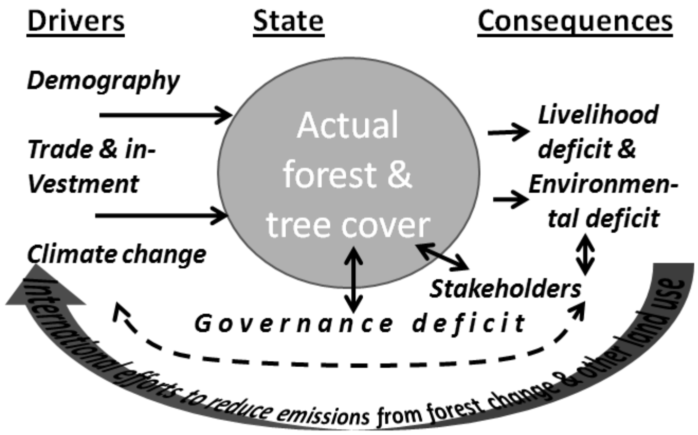


*Figure 2.1 Pressure/State/Response diagram of the way drivers of change influence the current state of forest and tree cover in any geographic area, the influence that has on livelihood and environmental service deficits (performance relative to an optimal configuration for either) and the trade-off between these deficits, attributing any sub-optimal performance to a ‹governance deficit› that does not effectively represent the stakes of all stakeholders. REDD+ is perceived as a partial answer to this governance deficit, linking global interests in emission reduction to the drivers active in tropical landscapes*

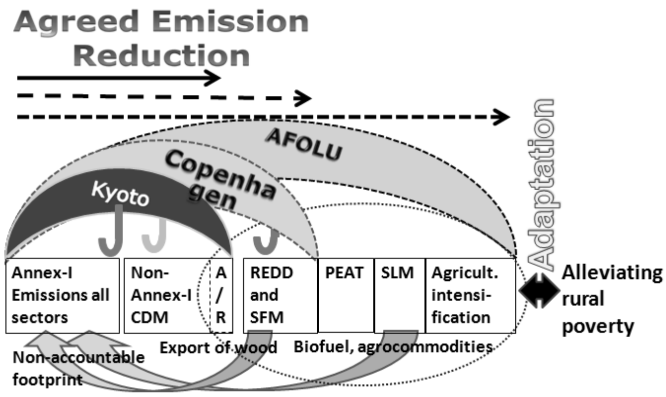


*Figure 2.2 Relationship between the levels of globally agreed emission reduction and the part of global emissions that is brought under the umbrella of agreements*

Three other components of land-related emissions, however, were not yet included in this approach: the emissions from peat-land (an issue in only a few countries but several percent of global emissions), emissions from non-sustainable land use (lack of sustainable land management) and from intensification of agriculture (including nitrous oxide and methane emissions and their carbon equivalents). A comprehensive, globally agreed accounting protocol for all these classes of emissions exists (AFOLU accounting, Figure 2.2). This broader group can also be referred to as REDD++, a further extension of the REDD+ debate by relaxing the forest definition to include virtually all land. Interactions between different types of land use form a challenge to any partial accounting: under the Kyoto Protocol industrialised countries can meet their emission reduction commitment by importing bio-fuels from non-Annex I countries, regardless of the emissions that are caused by the production of such fuels. On a voluntary basis the EU has implemented a RED strategy (Renewable Energy Directive) that up till now has probably been more effective in reducing emissions from deforestation than the emerging REDD+ regime. But the issue of carbon footprint and attributable emissions is not restricted to biofuel: the global trade in forest products and any agricultural commodity links emissions outside of Annex I countries to the economy of these countries and the links need to be addressed.

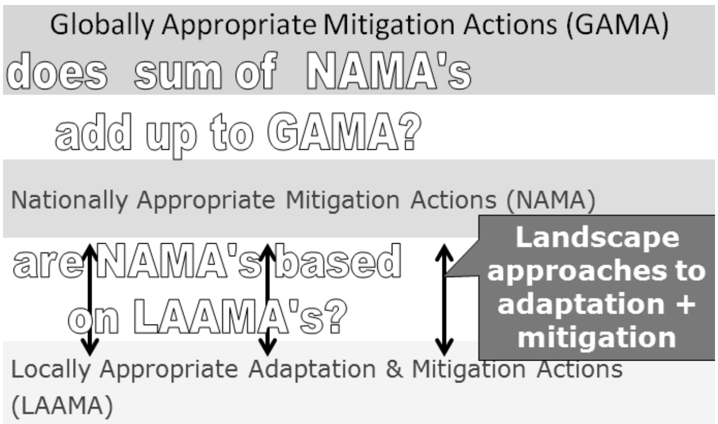


*Figure 2.3 Relationship between Nationally Appropriate Mitigation Actions (NAMA) and the emissions at global and local level (GAMA and LAAMA, respectively). Especially at local level, the relationship between adaptation and mitigation cannot be easily dissected*

The COP 13 in Bali (December 2007) not only defined approaches to REDD as a desirable part of future agreements (and asked the parties to the UNFCCC to experiment with approaches to achieve this goal), it also introduced the concept of Nationally Appropriate Mitigation Action, abbreviated as NAMA (Figure 2.3). The first two words of this concept highlight national authority: it is up to (developing) countries themselves to declare what they see as appropriate and what level of emission reduction they want to undertake; yet this is about mitigation actions that need to be accountable and open to verification as part of global emissions.

Negotiations leading up to COP 15 failed, however, to create clarity on how this concept can be operationalised. Some developing countries maintained that No Actual Mitigation Action would be appropriate for them, others made steps. Indonesia took the lead when President Yudhoyono declared that his country (i) will unilaterally reduce emissions by 26% relative to the extrapolated 2020 baseline; (ii) welcomes bilateral agreements to reduce a further 15% of emissions and by doing so stabilise at the 2005 level; and (iii) welcomes off-set markets to achieve further emission reduction on a voluntary basis. As important a signal as this was to the international negotiators, its operational translation within the country and between the various sectors is still being debated. The Copenhagen Agreement that was finally achieved is a watered down version of NAMA: asking all countries to declare their effort and commitment, but without clear rules. Thus, REDD+ is one of three current initiatives to reduce emissions from land use, along with the NAMA debate on countries declaring their Nationally Appropriate Mitigation Actions and the action of consumers to reduce their footprint, triggering the emergence of “responsible business” models that only buy from producers who do not deforest or cause undue emissions (Figure 2.4).


*Figure 2.4 The relationship between land use and three parts of the global feedback systems that try to reduce emissions from land use: the REDD+ agenda focussed on forest, the NAMA approach focussed on nationally appropriate mitigation action (can, but does not have to, include land use or selected parts of the AFOLU agenda) and the trade-based approaches: FLEGT=Forest Law Enforcement, Governance and Trade, an approach to restrict illegal logging through certified wood trade; RED=Renewable Energy Directive of the EU, with a counterpart under discussion in the USA, to reduce C footprint of biofuels; RSPO= roundtable on sustainable production of oil palm, with similar initiatives for other commodities. The combined effect of these measures relates both to the (top-down) agreements between nations for international rules and the bottom-up perspective of global citizens as consumers who stimulate ‘responsible business’ models to emerge*

While synergy between the various approaches to reduce net emissions is welcome (and probably essential to achieve overall success), the potential for overlapping claims of attribution are problematic. If net emissions will be reduced, will we attribute this to the countries, the global consumers or the REDD+ implementers? The more we make the financial schemes “performance based”, the more important it is to clarify this issue. These issues interact at the ‹baseline› level.

A major challenge in the cross-scale design of efforts to reduce emissions from deforestation and degradation has been the nested nature of the issue (Figure 2.5). In one extreme view, REDD requires simple rules for exchanging financial payments and credible/creditable emission reduction at the national border. How countries achieve the emission reduction is, in this view, their business, but emission reduction will be measured relative to a negotiated and agreed baseline and the definition of this baseline (or reference emission level) is the crux of the matter, linked to NAMA. Displacement of emissions to other countries is to be dealt with by ensuring that all countries are accountable by the same rules and are accounting with the same methods.

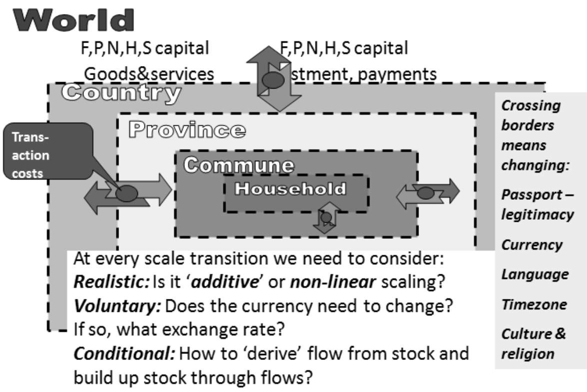


*Figure 2.5 Cross-scale issues between the world and individual households may involve several transition points where legitimacy/identity, currency, language, time zone and culture/religion change. Ultimately, natural (N), human (H), social (S), financial (F) and infrastructure (P) capital or assets matter and are measurable at all scales, but exchanges on goods and services may vary between payments and investments and the effective exchange rates between currencies*

Another extreme view is that REDD+ can (or even should) be implemented at “project scale” with rules that are related to the Clean Development Mechanism, with additionality, leakage and permanence as the three approaches to deal with cross-scale interactions: additionality means that baselines need to be agreed/negotiated beforehand; leakage means that attribution of (negative) impacts does not stop at the project boundary; permanence refers to the hope that the payments will in fact be an investment that lasts beyond the project timeframe. This view is "extreme" in the sense that most participants in the debate now realise that leakage of deforestation cannot be controlled at project scale: deflection of drivers of forest change can be global where high-value wood is involved and continental/regional for many other products. National and large subnational entities have to engage and take responsibility. Given the challenge of leakage it is a valid question what we can learn from "pilot" activities and from what scale we can "scale up". Direct involvement of national authorities and choice of "representative" (rather than "low hanging fruit") pilots is essential.

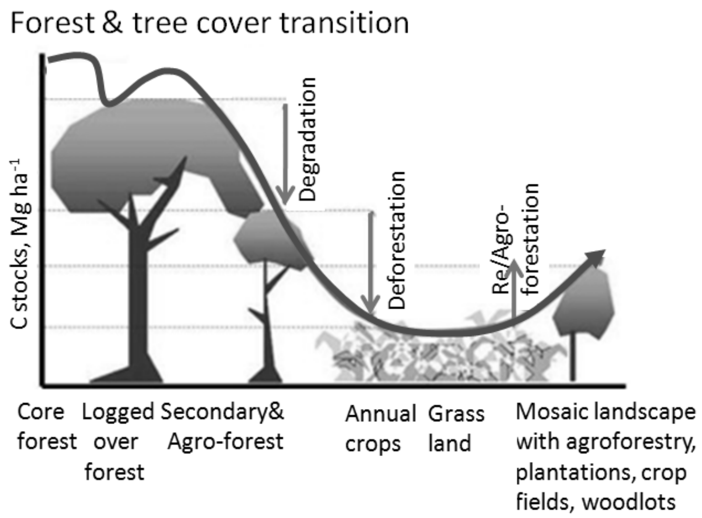


*Figure 2.6 Forest or tree cover transition, or the temporal change of many landscapes with a history as natural forest followed by forest use and degradation, a phase dominated by annual food crops and/or grasslands, and a return of trees to the landscape to create landscape mosaics with agroforestry, plantations, crop fields and woodlots. In as far as space can substitute for time, the forest transition is reflected in typical gradients of land use around urban centres.*

The Forest (or tree cover) Transition framework (Figure 2.6) relates various types of land use in time and space to a common set of drivers. Empirical evidence suggests that the transition into the upward (right hand) part of the curve is not very predictable but has occurred in many situations by some combination of "pull" and "push": scarcity of accessible forest increases the value of trees and encourages their use, while shortage of tree-based environmental services encourages this trend ("pull"), but movement of people to cities and shifts to non-agricultural jobs widens the land:labour ratio to a point where growing trees is more attractive than other land uses, or the point of land abandonment where natural succession gets a chance and causes a return of trees (the latter story applies in parts of Europe and North

America, not yet in Asia). Considerations at landscape and temporal forest transition scale make clear that baselines cannot be linear for very long: degradation will reach ground-zero when there is nothing left to degrade (the natural end of deforestation), but feedback processes generally lead to a turnaround before ground-zero is reached. Ironically, this may mean that where action seems most needed, at the peak of degradation, its "additionality" may be less than it seems, as other feedbacks are likely to set in. The non-linearity of baselines is in fact a major challenge to all current negotiators of modalities for emission reduction.

Concepts related to REDD have evolved rapidly over the last four years as described above. As debate on the reduction of emissions from forest change has progressed from RED up to REDD++ it has highlighted the complexity involved in managing multifunctional mosaic landscapes. Below is a summary of what each REDD options implies:

- **RED** = Reducing emissions from (gross) deforestation: only changes from "forest" to "non-forest" land cover types are included; details very dependent on the operational definition of "forest".
- **REDD** = RED combined with (forest) degradation, or shifts to lower carbon stock densities ***within*** the forest; details very dependent on the operational definition of "forest".
- **REDD+** = REDD combined with restocking within and towards "forest" (as specified in Bali Action Plan); some REDD+ versions include peatlands regardless of their forest status; details still dependent on the operational definition of "forest".
- **REDD++** = REALU = REDD+ combined with all transitions in land cover that affect carbon storage, whether peatland or mineral soil, trees-outside-forest, agroforests, plantations or natural forest. Details are *not* dependent on the operational definition of "forest".
- **National Appropriate Mitigation Actions** or "NAMA" (Bali 2006) include provisions for approaches to reducing emission levels that are adapted to diverse local conditions and national development pathways.

Since it is clear that applications of RED, REDD and REDD+ (but not REDD++) are strongly dependent on the operational definition of "forest", it is important to assess the national definition of forest. According to Vietnam's Forest Protection and Development Law 2004, "forest" is defined as 'an ecosystem with trees, animals and biota, soil and other environmental factors, in which timber species, bamboo or other species provide a canopy cover of more than 10%. Plantation forest and natural forest are grouped into production forest, protection forest and special-use forest'.

Under the frameworks of Kyoto Protocol and CDM in Vietnam, the Designated

National Authorities (DNA) under MONRE has already set the Vietnamese definition[1] that a forest is: (i) an area of at least 0.5 ha; with (ii) a minimum crown cover of 30%; and (iii) a minimum tree height at maturity of 3m.

In 2009, MARD introduced the most recently updated definition for Vietnam[2], where an area will be identified as a forest if it meets all the following 3 criteria: (i) being an ecosystem in which the main components are perennial timber species, coconut and other species with trees taller than 5m and a canopy cover of more than 10% (except newly established forest plantations and some mangrove forest), that can provide timber, NTFPs and other direct and indirect environmental services, such as biodiversity conservation, environmental protection and landscape beauty'. New forest plantations of timber trees and newly regenerated forests after exploitation of forest plantations will be identified as forests if they reach the average height of over 1.5 meters for slow-growing trees (for example, pine trees and some indigenous trees) and over 3 meters for fast-growing trees (such as wattle and eucalyptus) and a density of at least 1,000 trees per hectare; (ii) having a canopy cover of at least 0.1 for trees which constitute its major component; and (iii) having forest plots of at least 0.5 hectare each or forest tree strips of at least 20 meters in width and be composed of at least 3 tree lines. Thus, the term 'forest', as now defined for Vietnam is very close to that of the FAO[3] and the UNFCCC[4].

### 2.2 VIETNAM AS PART OF THE GLOBAL REDD+ DEBATE

The UNFCCC conference in Bali and the World Bank have both recognised Vietnam as one of the top five countries in the world expected to be most affected countries by climate change. In 2008, Vietnam was selected as a participant in the Forest Carbon Partnership Facility (FCPF) and in 2009 it was selected as the first country in the world to pilot the United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in developing countries (UN-REDD) funded by a trust fund, including the contribution of the Government of Norway[5].

UN-REDD allocated approximately 20% of its budget for work in Vietnam. Vietnam has about 0.7% of the total tropical forest carbon stock and ranked 17. It is, however, one of the very few tropical countries that reports an increase in forest area and has thus effectively dealt with the first D of REDD+, deforestation. Vietnam has established various national programs, such as the Five Million Hectare Reforestation Project (5MHRP), aimed at not only stopping deforestation but also

---

1 See official CDM definition of VN forests at http://cdm.unfccc.int/DNA/ARDNA.html?CID=233

2 MARD's Circular No. 34/2009/TT-BNNPTNT of dated of 10 June 2009 on criteria for forest identification and classification

3 According to the FAO definition, forest is defined as "land spanning more than 0.5 ha with trees higher than 5m and a canopy cover of more than 10%, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use"

4 The definition of deforestation is defined by UNFCCC as the areas that are included under forest, normally forming part of the forest area, which are temporarily unstocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest. The term "forest", as defined for the UNFCCC, can cover many types of land cover and use, varying in presence of trees (including zero tree cover lands), C-storage and C-emission potential, while the term "non-forest" can cover many types of land cover and use, potentially with a lot of trees, C-storage and C-emission potential.

5 The UNDP Vietnam Program has mustered USD 2.25 million to support the GoV on REDD, including USD 1 million from UN-REDD and USD 1.25 million from the Global Environment Facility (GEF).

increasing forest cover from 28% to 43% of total land area by 2015 (MARD 2001). In 2004, a new Forest Protection and Development Law (FPDL) was approved, providing Vietnam with a comprehensive legal framework relating to deforestation and degradation. As a means to release pressure on natural forest and by that decrease deforestation, program 147-Support Development of Forest Plantations-started in 2007 and will run until 2015. Further, the Forest Protection and Development Strategy for 2006-2020 presented two operational programs aiming to address deforestation and degradation: (i) the sustainable forest management program; and (ii) the forest protection, conservation and environmental services program. Besides these national programs, there are several regional or local programs that focus on sustainable land management and rural development.

Based on existing data (Meyfroidt and Lambin 2009), however, this does not imply that it has dealt with "emissions from deforestation", as the carbon stock per unit land of the "new" forest that is added annually is considerably less than the carbon stock of the natural forest that it continues to convert. Despite the fact that emission per capita in Vietnam is only one third of the global average (1.2 tons/year/person in Vietnam versus the global average level of 4.5 tons/year/person), $CO_2$ emission in Vietnam is increasing sharply compared with the world: from 6.7% in the period 1995-2000 to 10.6% in 2000-2005.

In terms of "forest transition", data suggest that Asia as a continent has made a transition to a net increase in forest area, largely due to the reported increase for China, but it still contains the country with the largest net emissions (Indonesia). Vietnam can be seen as a "nutshell" model of this situation, with parts of the country that resemble the Indonesia net deforestation pattern and parts that resemble China's net increase in forest area (but still with reductions in forest carbon stock). The relations between these different parts of the country are of specific interest.

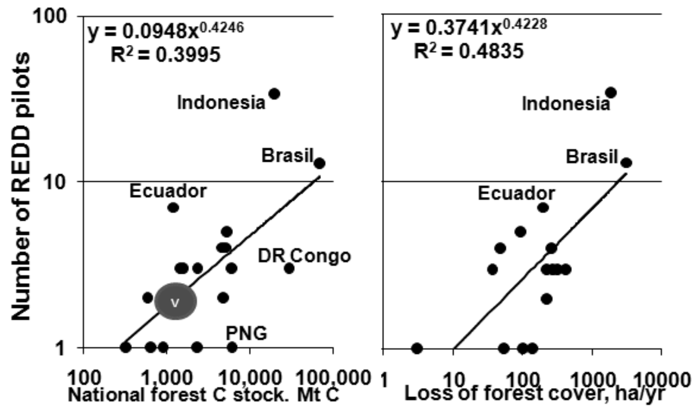


*Figure 2.7 Vietnam (V) in a global comparison of early REDD pilots compared to national forest C stock (left panel) and loss of forest cover (right panel; midpoint estimates by Gibbs* and others*); Vietnam is absent from the right panel graph because its loss of forest cover is negative*

After the UNFCCC meeting in Copenhagen in 2009 with the resulting Copenhagen accords, large funds for REDD activities have been or will be made available. During the meeting six countries (the US, UK, France, Japan, Australia and Norway) committed USD 3.5 billion for the period 2010-2012 as fast-start interim finance to kick-start the REDD process. Vietnam is a member of the core group of the Interim REDD Partnership, funded by Norway and France, to secure coordination, transparency, progress and positive precedents with the available fast-start interim funding for REDD activities. This partnership would aim to ensure rapid implementation of a global, coordinated effort to preserve the world›s tropical forests, in line with UNFCCC decisions (Pham 2010).

### 2.3 REDD VIETNAM NATIONAL PROCESS

The Vietnamese government emphasises that REDD and REDD+ should enhance sustainable forest management, biodiversity conservation and forest carbon stocks, all within current environment and socio-economic development strategies. As one of Vietnam's responses to the climate challenge, the REDD concept has been included in numerous key legal frameworks, including the National Target Program on Climate Change Response for the period 2009-2015 (NTP/CCR)[6], MARD's Action Plan Framework to respond to climate change[7], Decision 380[8], and the National Forestry Development Strategy. Vietnam is one of only a few countries to provide R-PINs in their applications for FCPF that included attention to industrial agriculture, plantations and urban development as drivers of forest loss (Dooley and others 2008). This demonstrates that REDD and REDD+ concepts are being considered by the government for application in Vietnam.

Since being selected in 2008 as a participant in FCPF, Vietnam has built a REDD road map, which starts with strengthening coordination among ministries. One of the main constraints identified to implementing payments for environmental services (PES) and REDD in Vietnam were overlaps between the mandates of different ministries and weak cross-sectoral coordination. MONRE is the national focal agency for climate change activities in Vietnam, whereas REDD in Vietnam is managed by a Climate Change Mitigation and Adaptation Steering Committee under MARD. However, governmental capacities for REDD are seated in the Department of Forestry at MARD. Although mandate division between the two ministries is clear and could potentially ease coordination, it may create difficulties in making any cross-sectoral action happen. A REDD National Network and working group has been established to enable the wider participation of stakeholders. International organisations support this interest, especially those that have been actively involved in REDD consultation, networking and method development processes, such as JICA, World Agroforestry Centre (ICRAF), Center for International Forestry Research (CIFOR), Winrock International, GTZ, RECOFTC,

---

6 NTP/CCR was approved in December 2008 (Decision 158/2008/QD-TTg dated 2/12/2008). Estimated costs for the period 2009-15: USD 1.2 billion.

7 Decision 2730/QD-BNN-KHCN dated 5/9/2008.

8 According to Decision No. 380/QD-TTg dated 10/4/2008 of the Prime Minister, PES policy is to be piloted in Lam Dong, and Son La. Three key environmental services of forests are piloted: (i) water supplies and regulation; (ii) soil erosion protection; and (iii) ecotourism.

SNV and Forest Trends. Yet the government seems to perceive these activities, especially those driven by international and national NGOs, to be opposing and complementary to government-led REDD activities. However, the ongoing consultation process to plan REDD has only included central government bodies, with few consultations in the pilot areas or other sections of the public. Indigenous people, including ethnic minorities, however, are often at the centre of the discussions because it is recognised that the success of REDD projects depends on positive incentives for all stakeholders (Hoang and Pham 2009).

To date, there have been more than 40 conservation and PES projects that can potentially be related to REDD in Vietnam. Most of these projects are small-scale, except UN-REDD Vietnam and two continuing large projects piloting Payment for Forest Environmental Services (PFES) schemes pursuant to Government Decision 380 in Lam Dong and Son La provinces. At the national level, REDD activities contain UN-REDD studies on REL, benefit sharing, and this ASB-ICRAF REALU assessment in Vietnam: “readying for REDD”. At the subnational level, several REDD studies and efforts are continuing (Table 2.1).

| Province | Project name | Project focus | Donors | Actors |
|---|---|---|---|---|
| **1. Core forest, logged -over forest, agroforestry, afforestation in the north and central area. Forest area increased by 196,198 ha during 2002 -2008** | | | | |
| Bac Kan | REDD-Alert | Drivers of D&D; opportunity cost analysis; remote sensing | EU | ICRAF<br>CIFOR<br>RCFEE |
| | RES/PES | Pro-poor PES mechanism for water and carbon | IFAD | ICRAF<br>Bac Kan PPC |
| **2. All range of forest and tree cover transition, with heavy deforestation and degradation. Forest area decreased by 52,035 ha during 2002-2008** | | | | |
| Lam Dong | UN-REDD<br>SNV | Awareness raising<br>Benefit sharing<br>MRV | Norway | UNDP<br>FAO<br>UNEP<br>MARD<br>Cat Tien NP |
| Dak Lak/Dak Nong | REDD-Alert | Drivers of D&D; Opportunity cost analysis; remote sensing, cross - sectoral land -use planning | EU | ICRAF<br>CIFOR<br>RCFEE<br>GDLA,MONRE<br>MARD<br>DONRE<br>DARD<br>Tay Nguyen University |
| | | Mapping land eligible for REDD and A/R CDM | JICA | FIPI<br>RCFEE<br>FSIV<br>VFU<br>JICA |
| **3. Southeast, deforestation and degradation of mangroves. Forest area decreased by 167,049 ha during 2002 -3008** | | | | |
| Kien Giang | | Mangrove PES-REDD | GTZ | GTZ |

*Table 2.1 Subnational REDD projects in Vietnam*

A national REDD network recently approved by MARD with the support of the REDD Technical Working Group will coordinate activities of Vietnamese agencies and international development partners in establishing institutions, policies and processes necessary for REDD readiness and implementation. It is seen as a practical and essential coordinating arrangement for REDD.

In terms of directions of further development, a study supported by the World Bank (Government of Vietnam 2009) divides the REDD readiness process in Vietnam into three categories:

- Category 1 entails establishment of a coordination and steering mechanism for REDD readiness, ensuring that key stakeholders are involved in the process. A series of scoping studies are prepared to explore the financial implications of REDD, revenue-sharing models and opportunity costs.
- Category 2 seeks to build a robust policy platform for REDD, through preparation of a National REDD Program (referred to as a national REDD strategy in many international documents) setting out a more comprehensive and detailed plan.
- Category 3 concentrates on preparing national REDD infrastructure, building capacity at national and subnational levels and establishing a national accounting system. It would also design demonstrations activities.

Several challenges are reported because Vietnam lacks supportive policies, mechanisms and tested guidelines to achieve an effective, transparent and practical payment system to individual households. Several actions are planned to tackle these challenges with support from donors such as NORAD, GTZ, USDA and the EU. Other challenges, as noted in Vietnam›s R-PIN, include the lack of tenure clarity, lack of money for tenure allocation programs, high opportunity costs for land conversion and limited data on deforestation trends because of the lack of coordination and technology within government departments. Data on deforestation trends in Vietnam are lacking and inaccurate for many reasons, including fragmentation of existing monitoring systems across government departments; application of low-resolution remote-sensing data in forest cover mapping; weaknesses in forest cover reporting systems from the local to the national level; and inconsistent use of forest classification systems between forest inventory cycles. Discussions underway include plans for local community groups to conduct monitoring to feed into national statistics (to be audited by the national REDD group) once tenure allocation to minorities has taken place.

### 2.4 REDD AND POVERTY

Vietnam has only recently started to develop markets for forest-based environmental services and has little experience in securing carbon offsets from voluntary carbon markets (Dooley and others 2008). Among the main reasons for this is that people (often the poor) who live in and near forests do not receive sufficient incentives to sustainably manage and conserve forests and to provide environmental goods and services to stakeholders who live outside forests. Formal policies to reward forest protection (forest protection contracts) have been undermined by: (i) government control and restrictions on forest use; (ii) low returns to participants and dependence on government; (iii) inadequate program funding; (iv) ambiguity and complexity in program provisions; and (v) equity problems (Sunderlin and Huynh 2005).

In Vietnam, it clearly makes sense to include both poverty alleviation and improved forest management as related strategic priorities since the areas of greatest poverty in the country (in terms of incidence and depth) tend to be those areas where natural forests remain (Sunderlin and Huynh 2005, Figure 2.8). Indeed, it is crucial for a future national poverty alleviation strategy to recognise the disproportionately high dependence of the ‹poorest of the poor› in Vietnam on forest resources. Conversely, in order to be successful, future forest management strategies aimed at slowing the pace of deforestation and enabling forest rehabilitation must fully recognise the crucial importance of improving both livelihoods and local rights needed to achieve these goals. Legislation on benefit sharing related to forests (known as Decision No. 178 of 12 November 2001) specifies benefits from sale of forest products by households and individuals to whom forest land has been allocated, leased or contracted. An important feature of this legislation is that individuals and households are able to receive two-thirds or more of the total value of harvested products, including timber, with the remaining share allocated to the commune budget or other government entities. In addition to benefits from forest products, forest dwellers can also benefit directly from maintaining healthy ecosystems.

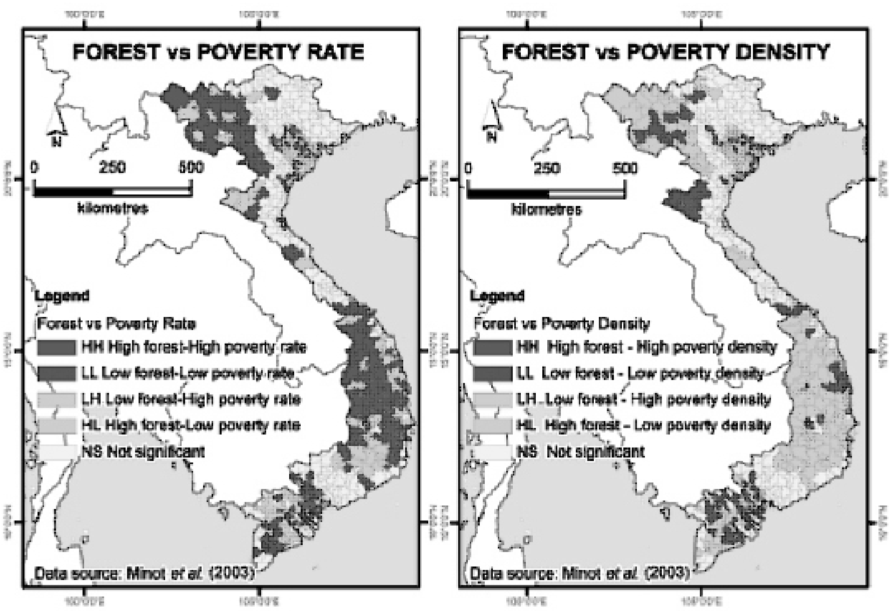


*Figure 2.8 Analysis of forest cover by poverty density in Vietnam (Source: Sunderlin and others 2007)*

Many efforts by various organisations in Vietnam are giving attention to harmonisation of REDD with poverty reduction. Thus far, however, such approaches are still at the proposal stage with no evidence of practical impact on the ground.

# Chapter 3
# Economic developments and implications for REDD leakages

## 3.1 INTRODUCTION

Leakage has been central in the REDD debate and it probably is the main reason that REDD cannot be approached at a project scale, unless these are embedded in national-scale accountability based on proper accounting rules. There are different interpretations and understanding of leakage, which impose different approaches in addressing this issue. In current and emerging standards for "voluntary market REDD", leakage is usually approached by a comparison of project and adjacent non-project areas; this is not easy to implement given that project delineation will normally follow some logic of internal homogeneity versus differences with surrounding areas. This report considers some popular views towards leakage and discusses their application in the Vietnam context.

## 3.2 LEAKAGE AND ITS IMPLICATIONS IN VIETNAM

In general, leakage is often used to describe greenhouse gas emissions displaced from one place to another (Mayfroidt and Lambin 2009). In general, there are three major views on REDD leakage that will be briefly discussed.

### 3.2.1 View 1: Leakage versus Displacement

Recently, climate/REDD negotiators have started to use the term ‹displacement of emissions› to refer to leakage in the context of REDD. Displacement of emissions can be seen as a synonym for leakage but some scholars propose to see these two terms in different contexts. Meyfroidt and Lambin (2009) claim that displacement accounts for any wood imported into a country and the corresponding deforestation or forest degradation abroad. It is a side-effect of policies aimed at protecting forests in a country. These policies reduce wood extraction in the country and thus the availability of wood (Mayfroidt and Lambin 2009). Defined this way, displacement is broader than leakage. It indeed covers leakage as well as drivers of deforestation and forest degradation. Moreover, some scholars argue that leakage refers to side-effects of policies with unintended consequences while displacement is often associated with intended consequences.

### 3.2.2 View 2: Leakage = Emission Displacement

In the context of REDD, leakage is the result of interventions to reduce emissions and can be referred to as "emissions displacement". This imply that emissions in one geographical area (subnational or national) that lead to an increase in emissions in another area. For example, if curbing the encroachment of agriculture into forests in one region results in conversion of forests to agriculture in another region this is considered to be "leakage".

In line with this definition and understanding, many interviewed REDD experts asserted that the terms "leakage" and "displacement" are probably referring to the same thing. Differing from the first view-which highlights the characteristic of leakage as often associated with unintended consequences-these scholars see that intent plays no role in differentiating between the two. In other words, for the purposes of climate change mitigation it does not matter whether you intend to create emissions (or know that your policies may result in increased emissions elsewhere) or it happens by accident (such as from forest fires). The issues of "objective measurement" (emission elsewhere) and "attribution" (link) both play a role, but we cannot make transparent policies based on inferred "intent". The only way to ensure that there is no leakage is to ensure that there is no "elsewhere", that is, that all land and all potentially emission-enhancing activities operate within the accounting frame.

### 3.2.3 View 3: Leakage types can be classified by REDD objectives

Together with the above two views, the central debate of ICRAF and ASB programs (Van Noordwijk and Minang 2009) is not to distinguish the differences between leakage and displacement, but rather to indicate different types of leakage based on REDD objectives.

1. **Planning-based leakage:** designation as REDD+ target of part of the forest area can lead to shifts of "planned emissions" to other parts of the forest domain; the only safeguard is national accounting for all forest areas.

2. **People-based leakage**: if the REDD+ target areas show a net emigration, the emission profile of the people moving out needs to be accounted for (they may be cutting forests elsewhere).

3. **Commodity-based leakage**: if the REDD+ target area will reduce its production of commodities without signs that the domestic/international market demand for that commodity declines, shifts in emissions are likely. The Meyfroidt and Lambin analysis of cross-border trade in wood products between Laos, Cambodia and Vietnam suggests that net gains in forest carbon stocks in Vietnam are logically linked to decreases in neighbouring countries. The only way to deal with such cross-border trade, however, is to ensure that all (or

at least a substantial majority of) countries account for changes in their national carbon stocks and deal with the consequences.

4. **Definition-based leakage**: the ultimate REDD versus REALU issue: if all "forest" is accounted for, emissions can still shift to "tree-based vegetation outside the forest definition".

### 3.2.4 View 4: Authors' view

In this report, we do not aim to discuss which view of the three above is right or wrong. Rather, we will discuss how these views and approaches can be reflected in the Vietnam context. We will use the term 'leakage' to refer to the displacement of greenhouse gases from one place to another regardless of national boundary. Leakage can occur at different scales. In this report, we will primarily but not exclusively discuss two levels of leakage: at the national and regional levels.

## 3.3 NATIONAL LEAKAGE/DISPLACEMENT

There are numerous studies funded by different donors and carried out by different researchers that discuss the drivers and causes of deforestation and forest degradation in Vietnam. Common findings on drivers of deforestation have been centralised around shifting cultivation (Wertz-Kanounnikoff and Kongphan-Apirak 2008), illegal logging (McElwee 2004; UN-REDD 2009), land conversion for cash crops (UN-REDD 2009; Chapters 2 and 4 of this report). Amongst the issues, this report focuses primarily on two causes of deforestation, namely, illegal timber logging and conversion from poor quality natural forest into rubber plantation, because they have direct implications for REDD leakage.

### 3.3.1 Small-scale illegal timber logging and implementation of PFES policy in the future

Forest cover in Vietnam rapidly reduced in the period 1940s-1980s partly owing to heavy timber exploitation (Nguyen VD 2001). To halt forest loss, the government introduced a logging ban in 1993. By the late 1990s, the ban extended to 4.8 million ha, or more than half of the country's national forest (FAO 2001). To oversee the forest, the capacity of the Forest Protection Department has been strengthened. By the late-1990s most of the logging taking place in Vietnam had been declared illegal and a police-like force was in place to prevent it. In addition, the government substantially provided financial resource to forest managers and provincial authorities to protect the forest. From 1995 to 2005, about USD 325 million was spent on forest protection and conservation (Forest Protection Department and others 2006).

Despite the ban, illegal logging in the country has been widespread (ADB cited in McElwee 2004)[9]. Statistics from the Forest Protection Department reveal that

---

9 The publication, however, does not distinguish between large-scale and small-scale illegal logging. The latter often occurs in the form of household-based illegal timber logging and usually does not account for deforestation (Sikor and To 2009) though public debate around illegal timber logging in the country often portrayed the small-scale loggers as the main driver of deforestation.

in 2009 the total of forest violation cases, most of which were associated with illegal logging, was about 50,000, with more than 57,700m$^3$ of timber confiscated. The actual figure of timber extracted illegally could be higher than the figure officially recorded.

The magnitude of illegal timber harvesting could account for deforestation and leakage, thus having a large impact on REDD intervention. A study by Sikor and To (2009, forthcoming) points out that illegal logging is attributed to the government's logging ban. While demand for wood products has accelerated owing to rapid economic development, particularly after the Open Door policy (often known as Doi Moi), the tightening of timber extraction in the country actually accelerated the timber price, which in turn serves as an economic driver for illegal logging to satisfy market demands. So, efforts to protect forests through a logging ban leads to REDD leakage.

The relationship between illegal timber logging and REDD leakage has some important implications for the implementation of PFES Policy in Vietnam in the future. While the implementation of PFES policy in Lam Dong and Son La has been finalising, the government has a firm belief that the policy, if implemented nationwide (over 15 large-scale watersheds), will help generate millions of dollars from service buyers, mainly from government-owned hydropower plants and water supply companies. In principle, the market for environmental services will be regulated on market principles with levels of payment based on the quality of services provided. Following this line, payment level increases once the forest condition is improved. For the government, one way to improve forest condition is to tighten forest protection, at least in 15 large watersheds in the country. However, illegal timber logging has been taking place in many of these watersheds[10]. Protecting timber in these watersheds may result in timber extraction in areas outside the watershed because of increasing market demands on wood products, therefore leading to REDD leakages. So far, discussion on REDD leakage as an impact of illegal timber logging and implementation of PFES policy has been entirely lacking. However, this can be considered as planning-based leakage and people-based leakage, which will need to have a national accounting system to address.

### 3.3.2 Rubber plantations in Vietnam and implications for REDD

Rubber has been described as "yellow gold" for Vietnam and elsewhere in the Mekong, including China. In the Vietnam, rubber is mainly exported to the Chinese market. Annual income derived from rubber export in 2006 was around USD 1.3 billion, making rubber the second largest income earner of Vietnam's agricultural exports (Vietnam News Agency 2007)[11]. Recently, export revenue derived from rubber has been in the top ten commodities. The price of rubber in 2006 was about

---

10 Personal communication with the directors of Cat Tien and Vu Quang national parks in 2010. In addition, illegal timber logging has been featured widely in the press. More information on illegal timber logging can be found at www.kiemlam.org.vn.

11 Source: Vietnam News Agency, 25 August 2007. Mở rộng diện tích cao su để xuất khẩu [Expanding rubber area for export].

USD 2,000 per ton. At this price, the net profit per hectare is about VND 30 million (about USD 1,600) (Tran Thai Hoc 2008).

The economic incentive of the ‹yellow gold› has made the government decide on the expansion of rubber areas in the country. In Decision 750/TTg dated 3 June 2009, the Prime Minister approved the master plan for the country's rubber development until 2015 and the vision for 2020, under which the area of rubber in the country will increase to 650,000 ha in 2010 and to 800,000 ha by 2015, with an expected export value of USD 1.8 billion. Three types of forest land will be used for expansion: current agricultural land with low economic return derived from household agricultural production; unused land; and poor quality natural forest under the "production forest" category. Table 3.1 describes the area where rubber will be grown in the future.

*Table 3.1 Government plan for rubber expansion by 2020 (Source: Calculation based on Decision 750/QĐ-TTg)*

| Region | New area intended (ha) | Total area intended until 2020 (ha) |
|---|---|---|
| Southeast | 25,000 | 390,000 |
| Highland plateau | 95,000-100,000 | 280,000 |
| Coastal area of Central-South region | 10,000-15,000 | 40,000 |
| North central region | 20,000 | 80,000 |
| Northwest region | NA | 50,000 |
| **Total** | **150,000-200,000** | **840,000** |

This report argues that the Circulation 38/CT of the Prime Minister on 5 December 2005 that reclassified three types of forest in the country, has paved the way for the expansion of rubber. After the reclassification, the area of protection forest shrank substantially. A large area of this kind of forest has been converted to rubber plantation (Tran Thai Hoc 2008). As mentioned in Chapter 4 of this Report, the "natural forest under production" category in the Highland Plateau with timber stock below 110 $m^3$ is considered poor quality and subject to conversion, while the figures for the northern mountain and other regions are much lower (75 $m^3$/ha and 90 $m^3$/ha respectively).

Of the six regional areas planned for expansion of rubber plantations, the Highland Plateau is the region with the largest area to be converted until 2020 (Table 3.1). In 2007-2008, local authorities in the region only focused on converting poor quality forest to rubber and not the other two kinds of land subjected to conversion (Tran Thai Hoc 2008). Weak law enforcement on the ground, coupled with loosely defined "poor quality forest" (measured exclusively in terms of standing timber volume) has triggered deforestation in many areas in the country, including that in the Highland Plateau. Examples of this kind of deforestation have been widely reported in the media (for example, Tuoitre Online 2010, Vietnamnet 2009, Tienphong Online 2008)[12]. According to the media, the conversion from forest into rubber plantation is not only seen exclusively as the clearance of land for rubber, but also a justification for timber logging intended by the government to meet market demand for wood products in the country.

Since 2008, rubber has been considered by the government as an agricultural cash crop and, at the same time, as a forest tree (Tuoitre online 2010). Classifying rubber tree this way helps fortify the government's intention to convert natural forest of poor quality under the production category into rubber plantations. However, the conversion of natural forest of poor quality to rubber plantation has substantially reduced carbon stock, let alone biodiversity resources. Further analysis and discussion on forest conversion to perennial crops, including rubber, is presented in Chapter 4.

If REDD leakage is simply defined as the displacement of carbon emissions from one place to another, the conversion from natural forest to rubber plantation can be considered as a kind of leakage driven by economic development. This can be also associated with commodity-based leakage, which has been discussed earlier. Perception of the rubber tree as a multipurpose tree serves as the foundation for justification of the leakage. The economic calculation for rubber plantations of USD 1,600 per hectare net profit will pose a huge difficulty for the implementation of REDD in the Highland Plateau. This conclusion confirms the findings derived from the Dak Nong case study in the next chapter of this report.

However, replacement of forest with rubber can be seen by scholars who have 'View 2' that it has nothing to do with carbon leakage: rubber simply provides a higher rate of return than the forest, the costs of removing the forest are largely born by people well away from the site and the short-term opportunity costs of not cutting down the forests exceed any compensation paid to keep them as carbon or for other purposes. What has been seen for rubber is merely conversion from one state to another (deforestation) and it is causing reduced carbon. It is not leakage. It is only leakage if, say, there is a forest REDD scheme somewhere and it is stopping rubber expansion and because of that scheme there is expansion of rubber in other areas. In other words, it could only be leakage if another comparable area was placed under conservation forcing conversion for rubber plantations to move elsewhere.

### 3.4 REGIONAL LEAKAGE

In recent years, export revenues derived from wood-based products have increased substantially, from USD 570 million in 2003 to USD 2.8 billion in 2008 (Forest Trends 2010). Export income derived from wood-based products is the fifth largest in the country (Forest Trends 2010). According to the recent National Forestry Strategy, the export revenue derived from wood-based products will increase to USD 7 billion by

---

12 Tuoitre online. 7 April 2010. Lại phá rừng để trồng cao su [Cutting down the forest for rubber plantation again] (http://tuoitre.vn/Chinh-tri-Xa-hoi/Phong-su-Ky-su/372309/Lai-pha-rung-trong-cao-su.html); Tuanvietnam.net. 26 June 2008. Đánh cắp từ rừng: việc chuyển 50.000 ha rừng sang trồng cao su? Gia Lai [Stolen from the forest: the conversion of 50,000 ha of forest to rubber plantation] (http://www.tienphong.vn/Tianyon/Index.aspx?ArticleID=127852&ChannelID=12)

2020 (MARD 2007). From 2000 to 2007, the number of wood-processing companies increased 2.83 times and continues increasing (Nguyen Ton Quyen 2010).

However, the wood industry in Vietnam is heavily dependent on raw material imported from aboard. Annually, around 160,000 $m^3$ of timber is extracted from natural forest, mainly located on the Highland Plateau, under the government›s logging quota scheme, though this volume will gradually reduce in the future as a result of the increasing environmental sensitivity of the public (Nguyen Ngoc Binh 2010).

Currently, the timber exported from natural forests and from forest plantations in the country only satisfies 20% of raw material demands for domestic consumption and export, while the remaining 80% of raw material (equalling 4 million $m^3$ of timber) has to be imported from abroad. Of the 120 countries exporting timber to Vietnam, Laos, Myanmar and Cambodia are the top three (Nguyen Ton Quyen 2010). While most of the wood imported by Vietnam from Laos and Myanmar is round wood, the majority of Cambodian wood imported is sawnwood. The export-oriented wood industry in Vietnam not only places pressure on the forest, both plantation and natural, inside Vietnam but also on natural forest in Laos, Cambodia and Myanmar, because all Vietnam's timber imports from those countries are extracted from natural forests (Forest Trends 2010, EIA and Telapak 2008).

While international scholars have considerable hope that REDD can become a solution for addressing deforestation, they also express concern regarding associated leakage issues that can threaten the sustainability and effectiveness of REDD mechanisms (UN-REDD and MARD 2010). From the international leakage point of view, the logging ban in Vietnam in the face of the evolution of the wood-processing industry, plus the shortage of raw material needed for domestic consumption and export (which has been partly attributed to the logging ban), has made Vietnam into a hub for consuming and processing very large quantities of timber extracted from the Mekong countries and, as a consequence, regional REDD leakage (also see Forest Trends 2010; Meyfroidt and Lambin 2009) While discussion on the legality of timber imported to Vietnam from the Mekong countries is important, such discussion goes beyond the scope of this report[13].

Regional leakage has been accelerated by agribusiness projects, particularly cash crops plantations (rubber, cashew and coffee), many of which are owned by Vietnamese companies. The limited amount of land for expansion of rubber plantation in Vietnam has made many companies go to Laos, Cambodia and Myanmar to establish plantations. According to the Vietnam Rubber Group-one of the seven biggest state-owned corporations in the country-by 2015 the group will have 100,000 ha of rubber in Laos and another 100,000 ha in Cambodia (Nong Nghiep Vietnam 2010)[14]. According to government plans; the country is to grow 200,000 ha of rubber in Myanmar in the year to come[15].

13 Detailed discussion on the legality of the timber imported into Vietnam from the Mekong can be found at Forest Trends (2010) and Meyfroidt and Lambin (2009).

14 Nong Nghiep Vietnam. Cao su đang rộng ở Campuchia [Area for rubber expanding in Cambodia]. Dated 11 January 2010. (http://www.nongnghiep.vn/nongnghiepvn/vi-VN/61/158/2/2/2/44701/Default.aspx).

15 Earth Times. Vietnam Bank to open branch in Myanmar. 5 January 2010. (http://www.earthtimes.org/articles/show/313381,vietnam-bank-to-open-branch-in-myanmar.html)

There are initiatives to strengthen forest law enforcement and governance, thus contributing to solving the problem of REDD leakage to a certain extent. The EU has just established the Asia Forest Law Enforcement, Governance and Trade Program (Asia FLEGT Program) that aims to reduce or halt furniture made in Asian countries from unknown or illegal sources, including those in the Mekong, and imported to the EU markets. The study by Forest Trends (2010) and EIA and Telapak (2008) highlights the need for coordinated regional action to strengthen the capacity of the countries in the Mekong to deal with deforestation and forest degradation and associated regional REDD driven by timber export and agribusiness projects. Under the PROFOR FLEG Program of the World Bank, effort has been made to strengthen forest law enforcement and governance, thus contributing to sustainable forest management.[16]

### 3.5 DISCUSSIONS AND CONCLUSIONS

The diversity of views on leakage and its interpretations clearly show this is one of the critical issues of REDD. This also draws out different implications for REDD implementation in practice.

First, under REDD, poor people may receive money as compensation for not cutting down their forest. This seems to lead to two other sorts of leakage. The money used to pay the compensation is likely to have been derived from carbon-generating activities, usually in Western countries. And, once paid, it is also likely to be used to purchase goods and services that generate carbon. This increase in carbon production is not counted as leakage. Should it be? Or, if not given to poor people, will it simply be used by rich people with the same high carbon consequences? Design of a REDD scheme should be carefully examined to avoid the potential consequences of leakage.

Secondly, REALU aims to reduce leakage by considering all land categories, not just forestry land, a form of definition-based leakage. However, even when all land-use types are considered, planning-based leakage, people-based leakage and commodity-based leakage (for example, rubber plantation case studies) can still occur if there is no strong governance and institutions are not in place. Therefore, leakage should be also addressed in forestry and land administration policies. In addition, since leakage can occur at different levels and is often difficult to measure given the lack of reliable data (for example, in the case of illegal logging), it is a great challenge for REDD practitioners. Since this often involves transboundary issues with cross-sectoral stakeholders, it also calls for regional approaches rather than individual efforts to ensure the net benefit of REDD schemes. Furthermore, we suggest that the only structural approach is to move from REDD+ to NAMA so that we can have a globally coherent mechanism that can treat "leakage" as an internal trade off issue.

---

[16] More information on the program can be found at : http://www.proftor.info/profor/

# Chapter 4
# Drivers of deforestation and degradation and the potential impact on emission

## 4.1 A NATIONAL REVIEW

Vietnam was one of only a few countries with Readiness-Project Idea Notes (R-PINs) in their application for FCPF that included attention to cash crops, plantations within rapid economic development, infrastructure and hydropower plans as drivers of forest change. However, is still a challenge for the country to map these drivers and their potential impact on forest lost in the context of REDD/REDD+, particularly on carbon stock changes. Options to include forestry in an overall framework of Agriculture, Forestry and Other Land Uses (AFOLU) have not yet been fully addressed because current REDD efforts in Vietnam mainly focus on forest and forest land management. The expansion implied by AFOLU has raised scores of policy-related questions that relate to issues of methodology: questions such as whether all offset proposals regarding land-use change should be included in the REDD category.

To address this, REALU in Vietnam has tried to map drivers of deforestation and degradation using a landscape approach and viewed through the lens of AFOLU. Land-use change analysis was conducted with land-use data changed over time using both land administration data, forest cover statistics and remote sensing data. The findings and its implications are presented in this section.

### 4.1.1 Inconsistencies in land-use classification in Vietnam

The land-use change and conversion study started with an analysis of land-use classification systems in order to merge different existing data sets in the country. Currently, there are two official land-use classification 'legends' that exist in Vietnam, mainly for management purposes. One legend belongs to the General Department of Land Administration (GDLA) under MONRE, where work focuses primarily on land management, including current land use and land-use planning. The other legend is employed by the Forest Protection Department (FPD). FPD recently joined with the Department of Forestry to form the General Department of Forestry (GDOF) at MARD, where emphasis is on forest management. As well, forest is also classified into 14 types according to natural ecological and structural characteristics (in accordance with international forest-type classification) as well as for biodiversity conservation purposes.

GDLA conducts land-use inventories every five years based on the National Land Registration System and ground surveys and annual land-use statistics. As mandated by MARD, the Forest Inventory and Planning Institute (FIPI) are responsible for conducting the National Forest Inventory, Monitoring and Assessment Program (NFIMAP), which is carried out every five years. GDOF at MARD and its branch offices at local levels are in charge of preparing annual monitoring reports on forest coverage, using FIPI's data as a baseline. These are compiled by FPD at GDOF into annual national forest cover statistics (R-PINs).

Methods used for the forest land inventory are based on both field surveys and ground truthing for prioritized areas or data from a previous inventory (for example, 1999) used as baseline data, re-checked using remote sensing techniques. It is important to note that data quality of annual reports on forest resource evolution is rather dubious, owing to lack of consistency in measurement, statistics and coordination within forest agencies (Doan Diem 2009, R-PINs). Both GDLA/MONRE and MARD recognise the need for one integrated national land classification system, which would provide the basis for efficient land-use management and land-use planning. Both ministries plan to start working on this national system in 2010 (GDLA, personal communication). How to integrate REDD into this national classification system is under discussion.

The inconsistency between existing land-use 'legends' may complicate efforts to determine the most appropriate land use 'legend' or classification for the country for REDD purposes. Furthermore, the proposed national land-use classification together with more clear mapping of forest land, resulting in both improved statistics and digital maps, is required for REDD accounting and monitoring. Some REDD-related impacts of the classification inconsistency are presented below.

Differences in these land-use classification legends led to inconsistencies in the forest data available. A detailed comparison of the legends was conducted to identify similarities and differences among features that are aggregated in delineating forest and non-forest land-use categories. Results are summarized in Table 4.1, with colours indicating the "forest" or "non-forest" status of each land-use category.

*Table 4.1 Comparison of two existing land-use categories in Vietnam*

| **GDLA land use classification** | |
|---|---|
| 1 | Agriculture |
| 1.1 | Agriculture production land |
| 1.2 | Forestry land |
| 1.2.1 | Production forest |
| 1.2.2 | Protection forest |
| 1.2.3 | Special-uses forest |
| 1.3 | Aquaculture land |
| 1.4 | Salt production |
| 1.5 | Other agriculture land |
| 2 | Non-agriculture land |
| 3 | Unused land |
| 4 | Coastal wetland (observed) |

| |
|---|
| Forest land in both categories |
| FPD:Forest land without forest<br>GDLA: Unused land |
| Other land uses |

| **FPD land use classification** | |
|---|---|
| I | Forest |
| A | Natural forest |
| A1 | Forest (wood stock) |
| A2 | Bamboo forest |
| A3 | Mixed forest |
| A4 | Mangrove forest |
| A5 | Rock mountain forest |
| B | Planted forest |
| B1 | Planted forest (w/wood stock) |
| B2 | Planted forest (w/o wood stock ) |
| B3 | Bamboo forest for production |
| B4 | Specialty tree |
| II | Bare land, mountain without forest |
| C1 | Ia (grass, cane) |
| C2 | Ib (scattered brush, tree, bamboo) |
| C3 | Ic (a lot of re-growth wood trees) |
| C4 | Rock mountain without forest |
| C5 | Sandbanks, swamps etc. |
| III | Other land |

Features that are common to both systems are (i) classification of total area under the three types of forest management and (ii) areas where natural forest is distinguished from plantation forest. The most significant difference between the two systems is the "forest identity" of "unused land" in GDLA's legend and "bare land, mountain without forest", also referred to as "forest land without forest" in FPD's legend. The classification of forest land without forest will probably be a significant source of difference in forest areas as defined by the two systems.

#### 4.1.2 Inconsistency in forest-related land-use data and changes of forest coverage

In an attempt to help further assess the consistency of forest area data between the two classification systems and more closely approximate key components needed for a REDD land classification system, the GDLA land-use legend was restructured to match with FPD data: "upland crops" was detached from "other annual crops" in consideration of its close relationship with forest land and deforestation. All forest-oriented land categories were extracted from current GDLA forest land categories and aggregated into "natural forest", "planted forest" and "land for forest regeneration".

This restructuring provided the basis for comparison of forest land-use categories of the two systems using data of 2005 and 2007[17]. Results reveal a difference

[17] The reason for choosing these two years is that the data set gathered from FPD was for the periods 2002, 2005 and 2007, while GDLA could provide data for two occasions 2000, 2005 and 2007. Therefore, the two sets of data can only be comparable in 2005 and 2007.

between the two systems summing of total area identified as forest land categories in 2005 and 2007: 4 million ha and 2.7 million ha respectively. This variation appears to come from the differences in land categories employed by the two institutions and is largely accounted for by areas named “forest land without forest” under the FPD system that are considered to be “unused land” plus land for forest regeneration under the GDLA system (Table 4.2).

*Table 4.2 Areas of forest-related land-use categories according to GDLA and FPD, 2005 and 2007. Unit: ’000 ha*

| Category | 2005 | | | 2007 | | |
|---|---|---|---|---|---|---|
| | GDLA data | FPD data | Difference | GDLA data | FPD data | Difference |
| *Total forest area* | *15,024* | *19,029* | *-4,004* | *15,174* | *17,847* | *-2,673* |
| Natural forest | 10,251 | 10,283 | -312 | 10,213 | 10,284 | -71 |
| Planted forest | 3,339 | 2,334 | 1,006 | 3,786 | 2,553 | 1,232 |
| Land for forest regeneration | 1,434 | - | 1,434 | 1,175 | - | 1,175 |
| Forest land without forest | - | 6,412 | -6,412 | - | 5,010 | -5,010 |
| *Unused land* | *5,066* | *-* | *5,066* | *4,732* | *-* | *4,732* |
| *Other land* | *13,420* | *13,991* | *-571* | *13,609* | *14,660* | *-1,051* |
| **Total country area** | **33,510** | **33,020** | 490 | **33,515** | **32,507** | 1,008 |

According to official statistical data (it is unclear whether this is GDLA or MARD data), the area of actual forest cover (forested) declined from 42% of the land area (14 million ha) in 1943 to 28% in 1990 (9.2 million ha). But it increased by 30% from 1990 to 2006 (12.8 million ha) mainly owing to reforestation programs. Comparing the statistical data of forest coverage in 2006 to the MARD data given in Table 4.2 above, the total forest coverage seems to account for planted forest plus natural forest. Furthermore, natural forest appears to be the only category where the two different systems provide consequent figures.

According to official statistical data for the period between 1976 and 2006, the natural forest area of Vietnam declined at a rate of 62,140 ha per year, corresponding to a 10% reduction in forest cover. However, the MARD data given in Table 4.1 shows no change in the natural forest areas in 2005 and 2007, while GDLA data showed a decrease by 38,000 ha. When the differences are identified the question arises: where are the inconsistencies and what data are the estimations based on? Further questions are raised that deal with the difference in classification: are the same land areas appointed different land-use characteristics or classifications in the two systems or are the noted differences a result of different areas being appointed similar characteristics? To find the answer to these questions further research needs to be carried out on land classification in Vietnam.

### 4.1.3 Drivers of deforestation and degradation

*4.1.3.1 Deforestation and degradation occurring in rich and average natural forest*

During the last decade, forest coverage in Vietnam has been increasing, from 33.2% in 1999 to 37% in 2005 and 38.7 % in 2008. On average, forest areas increased about 0.4% a year (Table 4.3). Natural forest area increased 97,000 ha per year and planted forest increased about 138,000 ha per year. The areas of bamboo forest and mangrove forest tended to decrease owing to land conversion to agricultural purposes and shrimp farming, while areas of other forest categories were more stable.

However, a longer term forest change trend analysis since 1943 in Vietnam showed a decrease of rich and average natural forest and an increase of planted forest. During 1945 to 1975, forest areas decreased mainly owing to warfare, shifting cultivation and timber exploitation. From 1976 to 1995, timber exploitation and agriculture were the main drivers. From 1996 up to now, natural forest increased (Table 4.3), but with a higher rate in the beginning and slowing during 2006-2008 (Table 4.4). This increase was the result mainly of the natural forest protection policy and forest generation national programs 327, 661 and other ODA programs. However, the quality of natural forest continues to decrease alarmingly. Between 1999 and 2005, the area of natural forest classified as rich forest decreased by 10.2% and medium forest reduced by 13.4%.

*Table 4.3. Changes of forest areas in Vietnam 1943-2008. Unit: Mha (Sources: Forest Protection Department, MARD, 2009)*

| Year | Natural forest | Planted forest | Sum | Forest cover (%) |
|---|---|---|---|---|
| 1943 | 14.3 | - | 14.3 | 43.0 |
| 1976 | 11.1 | 0.09 | 11.2 | 33.0 |
| 1980 | 10.2 | 0.4 | 10.6 | 32.0 |
| 1985 | 9.0 | 0.6 | 9.9 | 30.0 |
| 1990 | 8.4 | 0.7 | 9.2 | 28.0 |
| 1995 | 8.3 | 1.1 | 9.3 | 28.0 |
| 1999 | 9.5 | 1.5 | 11.0 | 33.2 |
| 2002 | 9.8 | 1.9 | 11.7 | 35.8 |
| 2005 | 10.3 | 2.3 | 12.6 | 37.0 |
| 2008 | 10.3 | 2.8 | 13.1 | 38.7 |

According to a recent report by the UK-based Environmental Investigation Agency and its Indonesian partner, Telapak, in March 2008, between 2000 and 2005 Vietnam lost 51% of its remaining primary forests, ranking second-worst in the world, and considerably worse than the third ranked country, Cambodia, with losses of 29%.

According to Doan Diem (2009) rich natural forest remains only in special and protection forest categories that are located in remote areas with no road access. Furthermore, forest quality and biodiversity are protected wherever the forest management boards work well. Of the total natural production forest, degraded natural forest occupies 79% while rich and average natural forest only 21%.

*Table 4.4 Changes of areas of natural forest 2002-2008 (Source: MARD). Unit: ha*

| Region | 2002 | 2008 | Increase/ decrease |
|---|---|---|---|
| **Nationwide** | **9,865,019** | **10,348,591** | **+ 483,572** |
| Northwest | 1,157,357 | 1,420,504 | +263,147 |
| Northeast | 2,042,548 | 2,319,186 | +276,638 |
| North central | 1,888,215 | 2,084,413 | +196,198 |
| South central coast | 1,457,375 | 1,405,340 | -52,035 |
| Highland plateau | 2,898,478 | 2,731,429 | -52,035 |
| Southeast | 305,456 | 280,198 | -167,049 |

The listed drivers during 2004-2008 of degradation of natural forest were mainly illegal logging, forest fires and upland cultivation, while the drivers of deforestation were harvesting/timber exploitation, land-use conversion and fire. Of these, land conversion seemed to be the main driver of the decrease of natural forest areas (Table 4.5). The causes of the drivers are international and national commercial interest for timber; expansion of cash crops; migration; need for food, feed and fuel by ethnic groups; the expansion of infrastructure and hydropower plants; as well as lack of capacity and political will from forest managers. Other causes were reported to be lack of tenure and insufficient funding for tenure allocation programs (Dooley and others 2008); as well as inadequate public policies (Wertz-Kanounnikoff and Kongphan-Apirak 2008). However, more accurate and detailed assessments need to be conducted in order to prepare sufficient, useful and meaningful emission reduction scenarios.

It is particularly important to account for the variation in drivers of deforestation and forest degradation among different regions within Vietnam. While forest loss has largely been due to conversion into agricultural land for upland crops in the Northeast, forest lands in highland plateau areas have been converted to higher value commercial and perennial crops. In the Mekong Delta, a large area of Melaleauca forests was converted to shrimp farms (Doan 2009, UN-REDD 2009).

*Table 4.5. Increase-decrease of forest areas 2004-2008 (compiled from MARD annual report, Doan Diem 2009). Unit: ha*

| Forest categories | 2004 | 2005 | 2006 | 2007 | 2008 | Total |
|---|---|---|---|---|---|---|
| **Forest land with forest** | **12,306,859** | **12,616,699** | **12,873,850** | **12,903,423** | **13,118,773** | - |
| **1. Natural forest** | **10,088,288** | **10,283,173** | **10,410,141** | **10,348,914** | **10,348,591** | - |
| ***a) Reasons for increase*** | **161,912** | **215,118** | **112,331** | **59,204** | **32,974** | **581,539** |
| Natural forest increase | 161,912 | 178,596 | 74,328 | 59,204 | 32,974 | 507,014 |
| Other forest | - | 36,522 | 38,003 | - | - | 74,525 |
| ***b) Reasons for decrease*** | **53,523** | **35,311** | **35,588** | **85,126** | **63,278** | **272,826** |
| Timber exploitation | 238 | 530 | 120 | 376 | **355** | 1,619 |
| Forest fire | 2,141 | 446 | 259 | 697 | 109 | 3,652 |
| Insect and diseases | - | 197 | 68 | 58 | - | 323 |
| Deforestation | 3,061 | 7,989 | 6,199 | 1,694 | 3,395 | 22,338 |

| Forest categories | 2004 | 2005 | 2006 | 2007 | 2008 | Total |
|---|---|---|---|---|---|---|
| Land-use conversion | 24,916 | 15,260 | 18,449 | 11,808 | 23,508 | 93,941 |
| Other reasons | 23,167 | 10,889 | 10,493 | 70,493 | 35,911 | 150,953 |
| **2. Planted forest** | **2,218,571** | **2,333,526** | **2,463,709** | **2,554,509** | **2,770,182** | - |
| ***a) Reasons for increase*** | **205,257** | **158,624** | **195,601** | **178,779** | **203,601** | **941,862** |
| Newly planted | 182,699 | 154,787 | 171,444 | 178,779 | 174,918 | 862,627 |
| Others | 22,558 | 3,837 | 24,157 | - | 28,683 | 79,235 |
| ***b) Reasons for decrease*** | **43,566** | **35,120** | **39,231** | **45,153** | **45,334** | **208,404** |
| Harvesting | 16,362 | 19,046 | 23,194 | 26,855 | 35,147 | 120,604 |
| Fire | 3,422 | 4,818 | 1,276 | 1,631 | 679 | 11,826 |
| Insects and disease | - | 153 | 71 | 279 | 18 | 521 |
| Deforestation | 600 | 1,159 | 2,249 | 136 | 502 | 4,646 |
| Land conversion | 10,026 | 8,237 | 12,441 | 4,802 | 8,988 | 44,494 |
| Others | 13,156 | 1,707 | - | 11,450 | - | 26,313 |
| **Coverage** | **36.7%** | **37%** | **38%** | **38.2%** | **38.7%** | - |

### *4.1.3.2 Conversion of natural forest to industrial crop plantation*

Among the various identified causes of deforestation of natural forest, cash crop plantation expansion has been found to be one of the most significant drivers (UN-REDD 2009). In order to promote economic development, some local authorities have licensed large numbers of projects for the conversion of forest land into rubber plantations. It is reported that many private enterprises with poor technical and financial capacity have ignored deforestation issues and conversion criteria (to convert only poor natural forest, see Chapter 3) and even intentionally devastated forest within forest lands allocated to them (MARD 2009). Rubber plantation companies have been involved in many cases of this type of deforestation. The comparison of areas under perennial crops during 2000-2007 and 2005-2007 shows that rubber seems to be the main contributor to the sharp areas increase of perennial crops in 2005-2007 (Figure 4.1).

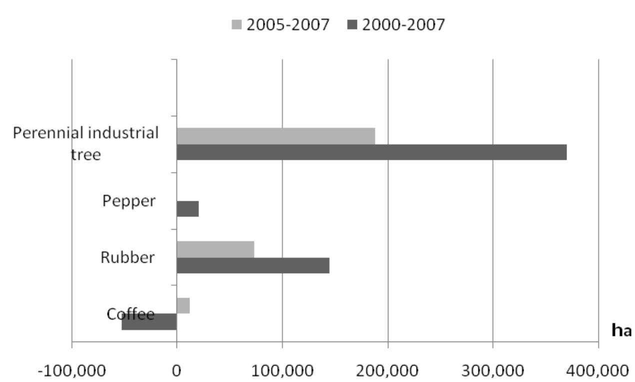


*Figure 4.1 Area changes of key industrial trees 2000-2007 and 2005-2007 (Source: MARD)*

*4.1.3.3 Conversion of forest to hydropower schemes*

Loss of forest area and other land owing to construction of hydropower plants is another concern. A brief survey nationwide found that resettlement for hydropower projects has already directly affected at least 550,000 people in the country (Dang 2007) and that the area of forest land that needs to be converted into annual crops for resettled households is more than 80,000 ha since each household needs at least 1 ha of land for food crops (Doan 2009). The current ‹serial construction› of hydropower plants in the Highland Plateau and Central provinces risks causing environmental damage, including clearance of forest for plant construction and for resettlement. In Quang Nam province, only four of the approved hydropower plants has already resulted in the clearance of 4,000 ha of protected forest, while another 6,000 ha of protected forest will be cleared in the future as electricity distribution facilities are established[18]. Additional support facilities for hydropower projects, such as resettlement areas and roads, will also result in significant loss of forest area. Indeed, as many as 150 hydropower projects have been implemented in the four provinces of Quang Nam, Thua Thien Hue, Kon Tum and Dak Nong (Doan 2009).

*4.1.3.4 Conversion of mangrove forest to shrimp farming*

Very high rates of deforestation in mangrove forest areas are another cause of concern-despite their contribution of only about 0.5 percent of current total forest area-because of their potentially important role in climate change and sea level rise in Vietnam. The total mangrove forest area is estimated to have decreased from 400,000 ha in 1943 to 156,500 ha in 2002. Assessments by GDLA indicate that by 2007 there were virtually no areas of undisturbed mangrove forest left in the country and FPD data indicate the total area of natural mangrove forest was only 60,000 ha. Deforestation of mangrove forest has been driven by (i) conversion of mangrove forest to agricultural land (during 1980-1985, for example, 20,000 ha of mangrove forest were reclaimed for agricultural purposes in the former Minh Hai province) and (ii) even more significantly, by the development of shrimp farming, which has replaced an estimated 200,000 ha of mangrove forest during the last 20 years (Nguyen and others 2008).

The causes of land-use conversions mentioned above may be caused by lack of harmonizing land-use policies between different sectors with different interests. Theoretically, macro-land-use planning should harmonize interests of ministries/sectors. However, land-use plans associated with the national Five-year Socio-Economic Development Plan (2006-2010) indicate that a large area of forest land is expected to be converted to land for industrial development, urban development and other non-agricultural purposes. Since these lands have not yet been used for such purposes, however, they have been subject to deforestation and forest degradation because forest management and protection measures are no longer applied to them.

---

[18] Director of Forest Protection Department of Quang Nam province, quoted by Tuoi Tre online, 16 October 2009.

### 4.1.4 The potential impacts of deforestation and degradation on emission

From the results of the emission estimation for 2000, forest and land-use change contributes about 10% (15.10 million $tCO_2$ equivalents) of total emissions, the third largest after emission from the energy and agriculture sectors. It was estimated that in 2010, emission from forest and land-use change would be 9.70 million $tCO_2$ equivalents. The estimation was made using modelling named COMAP, with inputs taken from plans of the forestry sector, including forest areas, rotation, carbon sequestration, life cycle of timber and income from forest. According to the national communication to UNFCCC, there are eight mitigation options for the forest sector. Among these, one option is for preserving existing protection forest, while the other seven options are for planting forest. Furthermore, forest and land use is considered by MONRE as a promising carbon sink.

To assess the possibility of achieving mitigation action on protecting existing natural forest, a comparison between land-use planning up to 2010 and its implementation up to 2008 was carried out by GDLA. It found that plans for all forest land were not achieved (except plans for special-use forest), while land for perennial crops and unused land expanded 124% and 156%, respectively (Table 4.6). Note that the “unused land” category according to the GDLA system is called “forest land without forest” in MARD system. This may indicate that the heavy forest land was converted to perennial crops and to degraded forest/forest land without forest. It may also indicate that continuing emissions owing to forestry and land-use change is worse than reported by MONRE (by 2010, emissions from forest and land-use change would be 9.70 million $tCO_2$ equivalents).

*Table 4.6 Land-use planning and its implementation (compiled from GDLA’s data)*

| Land use category | Area in 2005 (Mha) | Approved plans for 2010 (area in Mha) | Area in 2008 (Mha) | Compared between 2008–10 | |
|---|---|---|---|---|---|
| | | | | Area (Mha) | % |
| Agricultural land | 24.8 | 26.2 | 25.1 | -1.1 | 95.8 |
| Agricultural production land | 9.4 | 9.2 | 9.6 | 0.4 | 103.9 |
| Land for annual crops | 6.4 | 6.6 | 6.3 | -0.3 | 95.4 |
| Land for perennial crops | 3.0 | 2.7 | 3.3 | 0.6 | 124.8 |
| Forestry land | 14,7 | 16.2 | 14.8 | -1.4 | 90.9 |
| Land for production forest | 5.4 | 7.7 | 6.6 | -1.1 | 85.4 |
| Land for protection forest | 7.2 | 6.6 | 6.1 | -0.5 | 93.3 |
| Land for special-use forest | 2.1 | 2.0 | 2.0 | 0 | 103.9 |
| Non-agricultural land | 3.2 | 4.0 | 3.5 | -0.5 | 86.3 |
| Unused land | 5.1 | 2.9 | 4.5 | 1.6 | 156.6 |

According to R-PINs, there is no national estimate of greenhouse or carbon dioxide emissions from deforestation and forest degradation in Vietnam. This partly depends on the lack of carbon data for different land uses, including forest categories. In an effort to estimate potential impacts of land conversion on emissions, a review of carbon data of forest and land uses of existing conversion has been carried out. According to the review, carbon stock of the aboveground biomass of poor natural protection forest on the highland plateau is almost double that of rubber monocropping in Indonesia (87 tC/ha and 50 tC/ha, Table 4.7). Furthermore, carbon stock of natural forests is about 2-7 times higher than planted forest (87-175 tC/ha in natural forest compared to 33 tC/ha in planted forest, Table 4.7).

Degradation of natural forests has been observed in all regions. How to measure forest degradation is still a challenge. However, areas of forest degradation can be quantified if reliable and consistent data exists. At the moment, the criteria used by the National Forest Inventory, Monitoring and Assessment Program (NFIMAP) to assess forest quality are forest type, timber volume, canopy closure, composition of timber species and fragmentation. Assessment of other co-benefits-change in connection with forest degradation is not well developed. NFIMAP reports indicate that the percentage of commercially valuable forest species has reduced over time and now stands at less than 25% of the species composition. Further investigation of all types of forest degradation is clearly needed because of their potentially important roles in reduction of carbon stocks, as well as reductions to other co-benefits such as biodiversity, water and livelihoods of local people.

### 4.1.5 Discussion and conclusion

Results in this report point out the inconsistency in the land-use classification between the two ministries, MARD and MONRE, both dealing with different aspects of land use and land cover. Differences in these bodies› land-use classification legends led to inconsistencies in the forest data available. The data analysis of 2005 and 2007 showed the significant difference in areas named “forest land without forest” under the FPD system that are considered to be “unused land” plus land for forest regeneration under the GDLA system, while the area of natural forest seems to be most consistent among the two classification systems. When the differences are identified the question arises; where are the inconsistencies and what data are the estimations based on? Further questions also arise, dealing with the difference in classification: are the same land areas appointed different land-use characteristics or classifications in the two systems, or are the noted differences a result of different areas being appointed similar characteristics? To find the answer to these questions further research needs to be carried out on land classification in Vietnam.

For REDD readiness, consistency of land classification and subsequent land-use data is essential given that the monitoring, reporting and verification of REDD will be mainly based on the changes of forest areas over time, while REDD benefit-sharing may be based on land-use registration data. Given the fact that forest areas are managed by MARD while land-use right data is managed by GDLA/MONRE, how can performance-based payment for REDD be made if the two systems do not match? From the data point of view, the authors suggest REDD piloting should start with making the two systems consistent. As suggested by UN-REDD, Vietnam should use historical emission reduction as the basis for reference emission levels, with the starting point in 1997, and with an expected increase of forest area in 2013 as the impact of REDD+ action. It may be satisfactory to use MARD data for the past, but from 2010 a unique national system is urgently needed if we want to see the impact of REDD actions in 2013.

Despite the fact that total forest coverage has increased since 1997, natural forest has decreased since the 1940s. Putting these statistics together with the alarming degradation of rich and average natural forest during the last decade, Vietnam REDD/REDD+ should focus on natural forest as soon as possible, before all natural forest, together with its rich biodiversity, is gone. The carbon stock of rich natural forest is estimated to be 5-10 times higher than that of planted forest. Therefore, an increase in forest area alone cannot ensure expected emission reduction. If other co-benefits are also taken into account in REDD+ international payments, REDD+ rewards may not be attractive any more, when all rich natural forest changes to poor or planted forest.

The first driver of this process-illegal logging-may be controlled if effective protection management, including timber certification, is in place. The second important driver-land-use conversion, particularly to cash crops for economic benefits-can only be controlled if trade-offs can be made by policy makers and land users. The opportunity cost analysis is a useful tool for this purpose and should be considered as an important part of land-use planning, particularly when a REDD mechanism is considered as one of the sources of income. In order to use this tool, carbon and benefits measurements are also needed for alternative land uses, not only forest. The ineffectiveness of land-use planning implementation in the whole country during the last decade, particularly for forest-related land uses, suggests that the goal of emission reduction from forest and land-use change set out in Vietnam's national communication to the UN-FCCC (9.7 million $tCO_2$ equivalents in 2010) is unlikely to be fulfilled. The emission reduction scenario was made on the basis of land-use planning of the forestry sector alone, but land-use conversion, in reality, is mainly due to cross-sector planning and interests. This may suggest that addressing the forestry sector and foresters alone cannot make REDD effective. Cross-sectoral plans and planning is a must both for improved scenario development as well as for ensuring no "sudden" land-use change destroys all REDD efforts.

## 4.2 SUBNATIONAL ANALYSIS OF DRIVERS OF DEFORESTATION AND DEGRADATION AND OPPORTUNITY COST ANALYSIS: DAK NONG CASE STUDY

### 4.2.1 Background and objectives

Dak Nong province is located in the Highland Plateau of Vietnam (Tay Nguyen, in Vietnamese). The Highland Plateau is rated as number four among seven agro-ecological zones in Vietnam in terms of land use. The Highland Plateau is characterized by a complex topography, with mountains, highlands, valleys and delta and diversified soil types. About 1.3 million ha are fertile soils, rich in organic matter and nutrients, allowing the development of high value industrial perennial crops, such as coffee, rubber, pepper, cashew and fruit trees.

The Highland Plateau is a major "hot spot" for converting forest to agriculture in Vietnam. On average, from 1990 to now, forest was lost at a rate of 15,000 ha per year. As a result, forest cover declined from 75% in 1985 to 60% in 2009. The annual rate of deforestation in the Highland Plateau was the highest of all regions, accounting for 46.3% of the national forest area lost in the whole country. Consequently, the Highland Plateau was selected by MARD to be the focal area for REDD pilot activities. The rapid increase of population, together with unsustainable land use in this area has lead to rapid degradation and deforestation. Free immigration is considered to be the main driver of deforestation. Shifting cultivation is reported to be one of the causes of forest fire. Conversion of forest land to profitable agriculture use occurs at substantially higher rates than planned (Nguyen 2010). Understanding the current situation, defining causes of land-use conversion, in particular conversion of forest land, is very important. This can serve as the basis for both sustainable agriculture and forestry development, as well as for REDD strategy development. Remote sensing is a useful tool for mapping land-use change due to its advantages in rapidly providing data over time and space. Opportunity cost analysis can further aid in understanding the conversion choices of land users. These two tools, used together with a review of land administration data over time in Dak Nong province, as well as stakeholders' consultation meetings and workshop were used during March-May 2010 to understand the drivers of deforestation and degradation occurring in the province.

The overall objective of this case study is to underpin the findings from the national review (Chapter 4.1), as well as to test the OPCOST modelling tool newly developed by ASB-ICRAF. The following questions are addressed.

1. What are the current impacts of deforestation and land-use changes on carbon emission?
2. What level of economic profitability is associated with current carbon emissions and at what carbon market price levels could different degrees of deforestation and degradation be offset?
3. How to plan options for addressing drivers of deforestation and degradation by trying different inputs (land-use change, profitability, carbon stock change and carbon price) using OPCOST?

The specific objectives are threefold.

1. Assessment of land-use change with a focus on forest land-use change.
2. Defining causes and drivers of the main land-use changes as well as the underlying causes.
3. Testing how to combine remote sensing with opportunity costs analysis in running the OPCOST modelling tool.

### 4.2.2 Materials and methods

#### *4.2.2.1 Dak Nong province: characteristics*

Dak Nong borders on Dak Lak province in the north, Lam Dong province in the east, Binh Phuoc province in the south and Cambodia in the west. The province was recently (2004) established by splitting from Dak Lak province.

The climate of Dak Nong province is humid tropical and is affected by the dry, hot southwest monsoon. The climate is divided into two seasons: the rainy and the dry season. The annual average temperature varies between 22 and 23$^0$C, with a maximum temperature of 35$^0$C and a minimum temperature of 14$^0$C. The average annual rainfall is 2,300 mm, with the highest rainfall months being August and September and the lowest in January and February. The topography of the Dak Nong province is extremely multiform: alternated valleys, plateaus and high mountain terrain. The area is dominated by forest, with natural forest and plantations covering 57.5 % of the land area. The natural forest of Dak Nong has a high biological diversity, hosting several valuable tree species and rare animals and is also a provider of several environmental services including effective watershed protection and erosion prevention.

According to 2005 MONRE inventory, the total area of Dak Nong is 651,346 ha. With a population of 431,000, 15.2% of which is urban, the average population density is 66 persons km$^2$. Annual population growth rate is 2.02%. The major part of the province is forest land (370,548 ha) and crop land (223,491 ha). Of the latter, coffee is grown on 71,354 ha, cashew on 20,795 ha, rubber on 8,499 ha and pepper on 5,590 ha.

Owing to the monsoonal climate, the dry period can cause problems with water provision. Groundwater is used as drinking water and for irrigating crops. Indications are that Dak Nong is shifting to higher temperatures and less rain during the dry season, which is likely to cause forest fires and water shortages, affecting agricultural production and the lives of local farmers.

*4.2.2.2 Study process and activities*

The OPCOST model[19], used to frame this study, was developed to combine data on carbon stocks, profitability and land-use change. Depending on the relationship between land-use system-level carbon stocks and profitability, and assuming that in general land-use change progresses towards systems with higher profitability, it can help to quantify a number of issues.

1. The increase in profitability associated with local decrease in carbon stocks, as the ‘opportunity cost’ component of overall abatement costs.

2. The level of simultaneous local increase in carbon stocks that is associated with gains in profitability (leading to a spontaneous recovery of carbon stocks in the landscape that does not apparently require additional incentives).

3. The ‘anomalies’ of recorded land-use change associated with either decrease or increase in carbon stock but a decrease in profitability. If a considerable fraction of recorded land-use is in this category it may point towards incomplete understanding of profitability (missing elements in cost-benefit equations, incorrect prices, values and/or discount rates, and/or greater spatial dependence on the components of Net Present Value).

19 The model was developed by ASB-ICRAF on request from the World Bank, to be used by countries involved in FCPF (Forest Carbon Partnership Facility), including Vietnam. The model has been developed in Indonesia, Peru and Cameroon in 2007 and will be ready for use in June 2010.

Profitability of land use is assessed on the basis of Net Present Value or the discounted future cash flow (benefits-costs) of a land-use system over its life cycle.

$$NPV = S_i \text{ (benefits}_i \text{ - costs}_i)/(1 + r)^i \qquad \text{(Eq. 1)}$$

where r = discount rate

Combining the results on time-averaged carbon stocks and financial profitability produces an analysis of the trade-offs associated with different land uses. OPCOST was designed in order to compare economic costs of carbon emissions (on the basis of one tonne of equivalent $CO_2$) from such land-use changes, using abatement cost of the land-use changes calculated using Equation 2.

$$\text{Opportunity cost (\$/tCO}_2\text{eq)} = (NPV_{before} - NPV_{after})/(44/12)\ (Cstock_{after} - Cstock_{before}) \qquad \text{(Eq. 2)}$$

where:

44/12 is conversion factor from C to $CO_2$ based on their molecular weights

$NPV_{before}$: Net present value of the land-use type before conversion, USD/ha

$NPV_{after}$: Net present value of the land-use type after conversion, USD/ha

C-stock$_{before}$: time-averaged aboveground carbon stocks before conversion, tonnes C/ha

C-stock$_{after}$: time-averaged aboveground carbon stocks after conversion, tonnes C/ha

Unit: Abatement cost is presented in USD/t$CO_2$eq

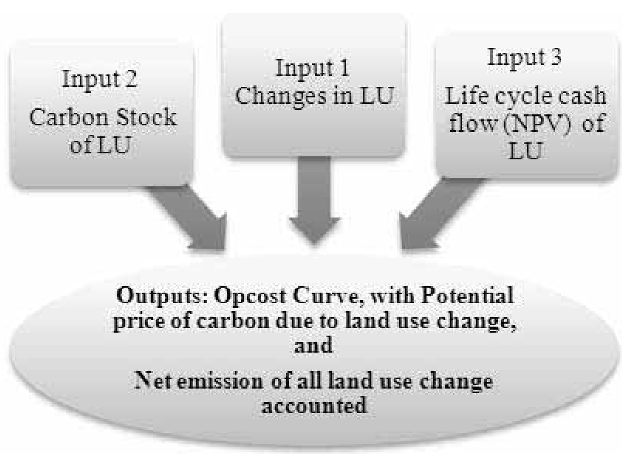


*Figure 4.2 Illustration of inputs and outputs of OPCOST*

Opportunity costs are thus estimated by the division between (i) time-averaged carbon stocks before and after land-use change (C-stock, t/ha) and (ii) Net Present

Value (NPV, $/ha) of the land use after and before the change. A number of activities were carried out as part of the process of building the model.

1. Matching land-use categories of Vietnam with that of OPCOST. The MARD classification system was selected owing to its more detailed classification of forest land data (Table 4.7).

2. Building a land-use change matrix from remote sensing analysis over time (Input 1, Figure 4.10). Given the fact that the province separated from Dak Lak province in 2004, land-use data are mostly available since that year. Two sets of data were used for the analysis, the first from GDLA for the period of 2004-2008 and the second from NIAPP. The data from NIAPP were from the same period; however, in some analysis longer historical data were used, dated back to 1979 (Figure 4.4).

3. Gathering appropriate carbon stock data for Vietnam and, if missing, defining appropriate data in the tropics to fill in the gaps (Input 2, see Table 4.7).

4. Gathering NPV of land-use systems involved in studied land-use changes and, if missing, defining appropriate data in the tropics to fill in the gaps (Input 3, see Table 4.7).

5. Testing the model.

6. Interpretation of the curves (outputs of the model) using knowledge of land-use change in reality, backed-up by statistic data of land-use change.

7. Stakeholders' consultations on the methods and findings were carried out in a half-day workshop in Dak Nong province and a one-day national workshop in Hanoi. Perspectives from stakeholders on the findings and the issues were collected using brainstorming techniques.

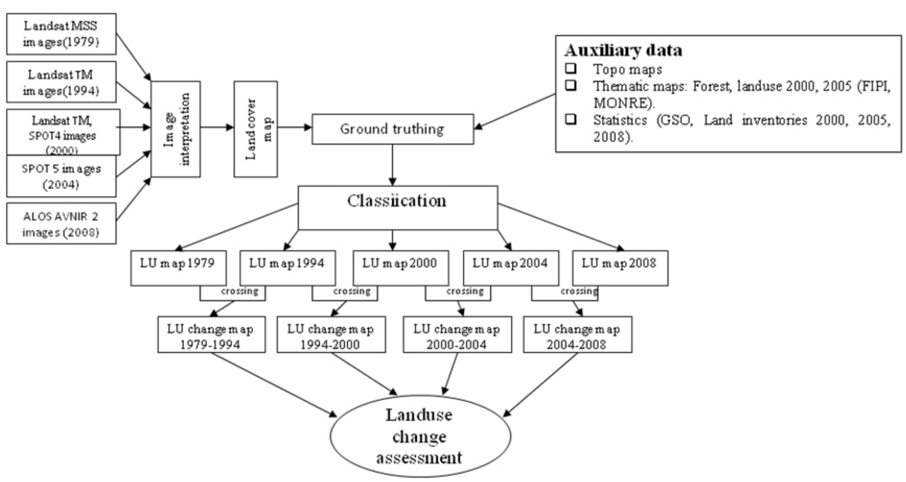


*Figure 4.3 Processing procedures for land-use change detection with remote sensing data for obtaining land-use change matrix*

Three remote sensing analysis methods were used.

1. First method: Output map consisting of two classes: change and no-change areas. This method is often applied to study and evaluate changes within a land-cover type.

2. Second method: All the pixels or polygons were classified by the combination of classes in the "first year" with classes in the "second year". Although these maps contain all such information from both original maps, a large number of classes will lead to "overshadowing" the map information.

3. Third method: Combination of changes of the "first year" to the "second year" is classified on a qualitative basis, describing one change characteristic. For example, all regions on the map now classify the type of forest transformed into shrub as "degradation". Number of layers is not limited, to serve different study purposes. This method is very useful for giving an overview of each issue.

*Table 4.7 Values used as inputs 1 and 2 for running OPCOST*

| Land-use legend | Time-averaged carbon stocks* | | Profitability** | |
|---|---|---|---|---|
| | (tC/ha) | Source | (NPV, $/ha) | Source |
| Natural rich forest | 175 | Bao Huy and Pham Tuan Anh 2008 and Bao Huy 2009<br>Measured on Highland Plateau of Vietnam | 50 | van Noordwijk 2009 |
| Natural medium forest | 103 | As above | 300 | As above |
| Natural poor forest | 87 | As above | 600 | As above |
| Open dry forest | 87 | Assumed to be the same as natural poor forest | 600 | Assumed to be the same as natural poor forest |
| Bamboo forest | 87 | As above | 600 | As above |
| Mixed forest | 87 | As above | 600 | As above |
| Young forest (regrowth) | 35 | van Noordwijk 2009 Calculated for fallow/regrowth | 300 | van Noordwijk 2009<br>For fallow/regrowth |
| Planted forest (*Acacia mangium*, 7 years-old) | 33 | Vu 2009<br>Average of *Acacia mangium* (6 years and 8 years, planted in various regions of Vietnam) | 1,300 | Vu 2009<br>For *Acacia mangium* planted in various regions of Vietnam |
| Rice | 5 | van Noordwijk 2009<br>For intensive crops | 1,200 | van Noordwijk 2009 |
| Other annual crops | 5 | Assumed to be the same as rice | 1,200 | Assumed to be the same as rice |
| Shifting cultivation | 15 | van Noordwijk 2009<br>For extensive crops | 400 | van Noordwijk 2009 |
| Coffee | 50 | van Noordwijk 2009<br>For tree crop plantations | 5,700 | Nguyen 2010<br>Cashew of 25-year economic cycle, planted in Dak Nong province |
| Rubber | 50 | As above | 31,000 | Tran 2010<br>Rubber of 27-year economic cycle planted in Gia Lai province, Highland Plateau of Vietnam |

| Land-use legend | Time-averaged carbon stocks* | | Profitability** | |
|---|---|---|---|---|
| | (tC/ha) | Source | (NPV, $/ha) | Source |
| Cashew | 50 | As above | 1,000 | van Noordwijk 2009<br>For tree crop plantation |
| Pepper | 40 | van Noordwijk 2009<br>for tree crop plantations | 1,500 | van Noordwijk 2009 |
| Other perennial crops | 40 | van Noordwijk 2009<br>For tree crop plantations | 1,500 | As above |
| Settlement | 15 | van Noordwijk 2009 | 2,000 | van Noordwijk 2009 |
| Water | 0 | Assumption by ICRAF Vietnam | 2,000 | Assumed to be the same with settlement land |
| Bare land | 4 | Swallow and others, 2007<br>Value calculated in Indonesia | 0 | Assumption by ICRAF Vietnam |

** The data from Vietnam was used with the assumption that the values were not significantly different to the time-averaged carbon stock of those land uses. Other carbon stock values were taken either from Swallow and others (2007) or van Noordwijk (2009b).*

*** NPV was estimated for the life cycles of species: coffee, 30 years; rubber, 27 years; natural forest, 50 years.*

### 4.2.3 Findings

#### *4.2.3.1 Trends of land-use change in Dak Nong province*

The long-term land-use and land-cover trend for Dak Nong province shows diverse development. Over the past 30 years, forest land decreased from 97.8% in 1979 to 51.7% in 2008. Agricultural land has increased from around 2% to over 34%, including both perennial and annual crops. In 2008, industrial crops and shifting cultivation seem to be the most preferred land uses among agricultural uses, given that 94% of perennial crop land is under industrial species and 73% of annual crops are shifting cultivation.

The area dedicated to upland crop was highest (5.8%) in 2000 and slightly decreased to 3.2% in 2008. The one land use that has stayed more or less intact over the years is barren land, approximately 8% in 2000 (Figure 4.4).

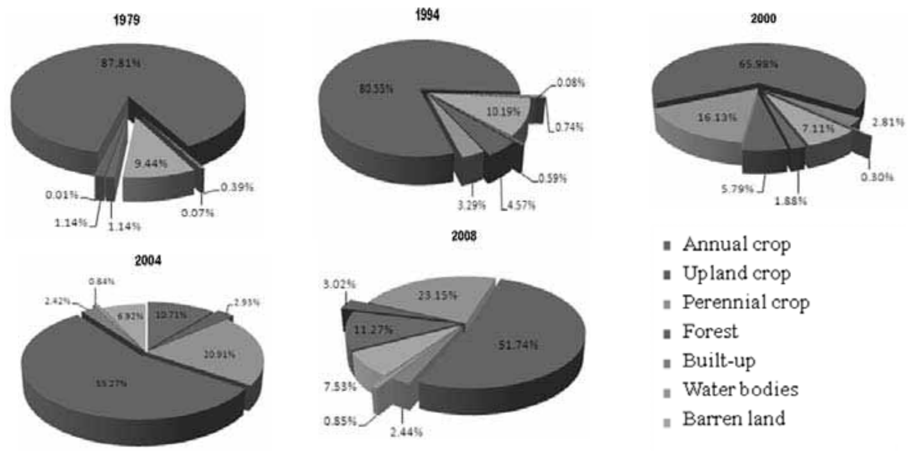


*Figure 4.4 Changes of land-use categories in Dak Nong during 1979-2008 (Source: NIAPP)*

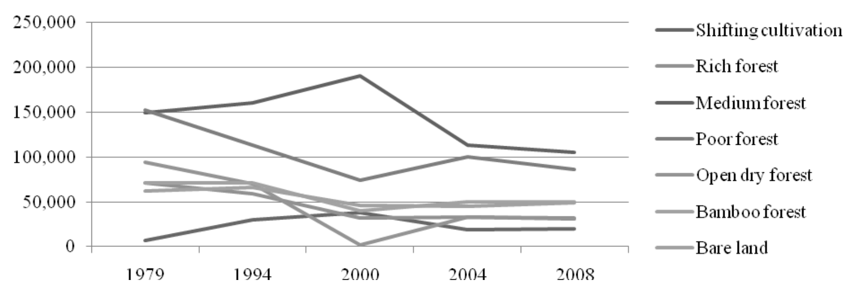


*Figure 4.5 Trend of forest categories in Dak Nong between 1979 and 2008 (Source: NIAPP)*

Changes of forest land categories: During 1979-2000, the area of most forest land categories decreased; only areas of shifting cultivation and medium forest increased (Figure 4.4). The sharp increase of perennial crops during the same period (Figure 4.5) may indicate that most forest land was converted to shifting cultivation and perennial crops. While rich forest area decreased all the time, areas of poor forest increased sharply during 2000-2004 but slightly reduced during 2004-2008. The trends show that before 2000 the conversion of forest land to shifting cultivation and perennial crops occurred in all forest land categories while during 2000-2004 forest degradation was a factor. The reduction of poor forest during 2004-2008 may be explained by the increase of perennial crops and other non-agricultural lands (Figure 4.6).

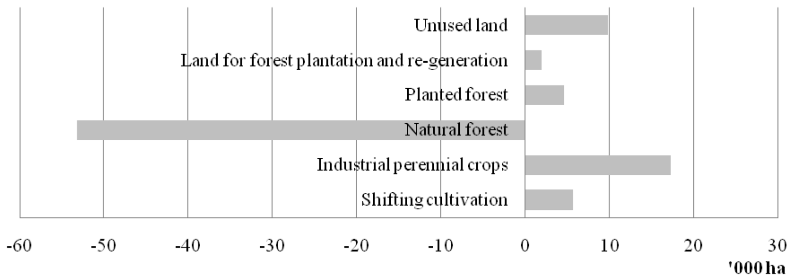


*Figure 4.6 Changes in forest-related land use in Dak Nong during 2004 - 2008 (Source: GDLA)*

Changes of natural forest: Further analysis of data during 2004 to 2008 showed a decrease of the area of natural forest of more than 50,000 ha while at the same time other land-use categories increased (ranked: industrial crops > unused land >shifting cultivation>planted forest>forest regeneration).

Changes of industrial crops: Industrial cropping is the land use that enjoyed the largest increase in area during 2004-2008, by 17,300 ha. In 2004, coffee plantations represented 59% of industrial crop land, followed by cashew plantations, rubber and other perennial crops. Rubber plantation covers 7% and is the only perennial crop with an area increasing in 2004-2008. It has been shown that rubber areas were created from not only bare land and poor natural production forest, but also from medium natural production forest, as well as other annual crops (Figure 4.7).

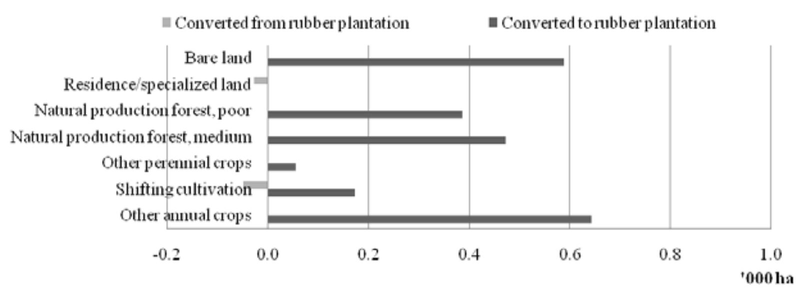


*Figure 4.7 Conversion to and from rubber plantation areas in Dak Nong during 2004-2008 (Source: NIAPP)*

Changes in shifting cultivation: The analysis of 2004-2008 data shows that areas of shifting cultivation were mainly created from poor natural production forest. Land was also converted from open dry forest for production, forest land without forest, residential areas and, to some extent, the rich, medium and poor natural production forests were converted into shifting cultivation. At the same time, large areas of shifting cultivation are being left as bare land and only a small portion of the areas converted to industrial crops (Figure 4.8).

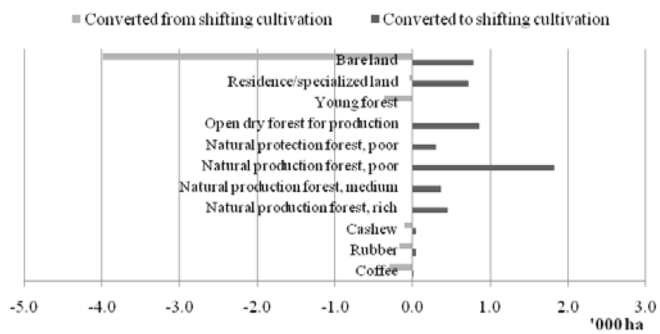


*Figure 4.8 Conversion from and to shifting cultivation in Dak Nong during 2004-2008 (Source: NIAPP)*

*4.2.3.2 Causes and impacts of forest land conversion*

In Dak Nong in 2004, natural forest land belonged more to economic organisations, while perennial crop land and shifting cultivation belonged more to households. Furthermore, all land categories belonging to economic organisations (natural forest, perennial crops, shifting cultivation) decreased during 2004-2008, while areas of perennial crops and shifting cultivation of households increased. However, the area under planted forest of economic organisations increased, more than doubling under during the four years, from 4,800 ha to more than 11,000 ha (Figure 4.9).

Who is responsible for the loss of natural forest? For natural forest, land allocation should last for more than 30 years. Given that land allocation started late, in the 1990s, forest land-use rights of economic organisations could not be changed during 2004-2008. So the issue here would be that economic organisations could not protect their natural forest. The next question is, how could households increase their allocation of legal land for perennial crops and shifting cultivation? One possibility could be that households cleared forest land for these purposes. Given

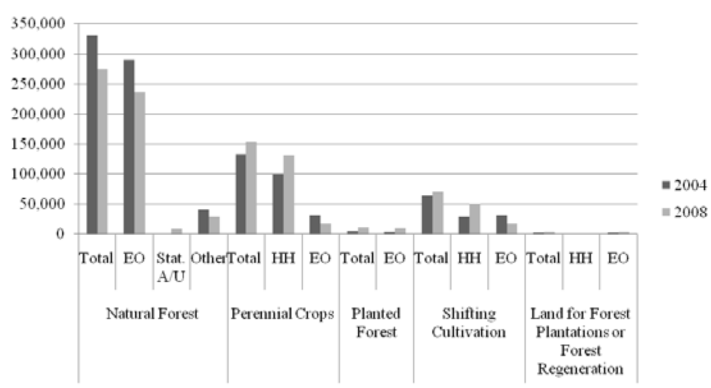


*Figure 4.9 Land users in selected land-use systems in Dak Nong in the years 2004 and 2008 (EO: Economic Organizations. Stat A/U: State Authorities/Unit. HH: Households. Other: Other land users)*

that both perennial crops and shifting cultivation usually require good land, it is hard to believe that these extra areas were reclaimed from bare land. The findings may suggest that households play an important role in land-use change decision making.

The next question is, is the state, the representative land owner[20], aware of what is really happening in land-use change? As land-use planning is a tool used by government in managing land use and land-use change, a comparison between land-use planning and real land-use change has been made to answer this question.

The analysis of land-use planning compared to real land-use change during 2006 to 2008 shows that land-use change in Dak Nong did not take place according to land-use plans. The largest difference can be seen in the natural protection forest loss of more than 50,000 ha when no decrease of this kind of land was planned. Both the industrial perennial crops and shifting cultivation showed an increase when according to the plan they should decrease. The difference between the planned land-use change and real land-use change is approximately 18,000 ha for the industrial perennial crops and just less than 6,000 ha for the shifting cultivation. The only land use that follows the plan is planted production forest, which increased about 7,000 ha, all according to plan. The findings may indicate the weakness of current land-use planning. If so, why it is so weak?

According to local policy makers and professionals in Dak Nong, lack of appropriate land-use management and planning was considered the most important cause leading to loss of natural forest for other land uses. The sectoral approach in planning was blamed for the uncontrolled land-use changes. Land suitability for perennial crops and high returns were the causes of the expansion of these uses. Land price for perennial crops was reported to be the motivation for clearing land for shifting cultivation (as a way of keeping land for selling later), besides the need for food owing to the increase of imported rice. Immigration from other regions seems also to be an important cause. Two policy-related causes mentioned were the rules for land allocations are unclear and the government rubber expansion decision. Low awareness of the impacts of shifting cultivation was also reported (Table 4.8). The root of the causes seems to be economic.

Answering the question on the impacts of land conversion, the stakeholders listed water shortage as the most important impact, followed by soil erosion and landslides. The policy that allows rubber plantations to be established on natural poor forest is fulfilling its aim and in doing so degrades the natural forest, both in terms of carbon stock and biodiversity (Table 4.8). In general, the stakeholders are well aware of both the causes and the impacts of land-use change, however, environmental impacts are dominating the discussion on implications for land-use change, while economical and social impacts are left out. If a similar exercise was conducted with land users and households, the economic and social impacts would appear.

---

[20] According to Land Law (2003) in Vietnam, land belongs to the entire people with the State as the representative owner, and it is allocated to land users for different land use purposes.

*Table 4.8 Perspective from local stakeholders on causes and impacts of land conversion (31 local policymakers and professionals)*

| Description of issue | Causes | Impacts |
|---|---|---|
| ***Natural production forest to other land uses*** | • Inadequate management leading to:<br>o Agricultural development and forest plantation projects<br>o Over- and unplanned forest exploitation<br>o Natural forest quality has been decreasing, thus converted to other land uses<br>• MARD's policy allows conversion from natural poor forest to rubber plantation | • Water retaining capacity has been reduced thus:<br>o Droughts<br>o Less underground water availability<br>• Soil erosion and landslides |
| ***Decrease of natural protection forest areas*** | • Immigration from other regions thus more lands needed for cultivation<br>• Inadequate management and planning leading to:<br>o Illegal forest exploitation and deforestation<br>o Natural degradation of forest quality<br>o Too many industrial zones and hydropower plants have been established or planned to be established<br>• Land-use plans overlapped due to different sectors/branches› planning<br>• Government's payment for forest protection and management was low and forest allocation mechanism was unclear<br>• Criteria of planning of three types of forest (production, protection and special uses) were changed in 2005 | • Water retaining capacity has been reduced thus:<br>o Droughts<br>o Less underground water availability<br>o Floods in rainy season<br>• Soil erosion and landslides<br>• Forest quality decreased as protection forests were converted to production forests |
| ***Increase of shifting cultivation area*** | • Inadequate management measures leads to local people clearing (forest) land for future industrial tree plantations and temporarily applying shifting cultivation on that land<br>• Immigration from other region has increased rapidly<br>• Economic pressure: rice price has increased (rice is imported from Mekong Delta)<br>• Local farming traditions<br>• Insufficient social supporting policies thus people›s awareness of forest protection was low while unemployment rate was high, posing threats of conversion of forest to shifting cultivation | • Forest cover decreased thus<br>o Microclimate changed<br>o Ecological balance and biodiversity disturbed<br>o Soil erosion increased, especially in early rainy season (April and May)<br>o Water retaining capacity decreased<br>o Less availability of underground water<br>• Unsustainable cultivation processes made soil quality and structure decrease |

| Description of issue | Causes | Impacts |
|---|---|---|
| ***Increase of industrial crops*** | • Inadequate management and planning leading to:<br>o Increased illegal and spontaneous land-use conversion by farmers<br>o Land-use planning not harmonized between different sectors/branches<br>• Local natural condition favours industrial perennial crops<br>• Industrial perennial crops provide high income | • Water balance was disturbed, especially in case of coffee plantations since coffee tree›s water demand is high<br>• Soil erosion and landslides<br>• Social and ecological benefit have been decreasing |

*4.2.3.3. Opportunity costs analysis*

*Land use change matrix:* Land use change matrix over 20 years (1979-2008, Figure 4.10) showed clearly the highest land use conversions are forest to industrial crops, rich forest to poor forest, and forest plantation.

'000 ha

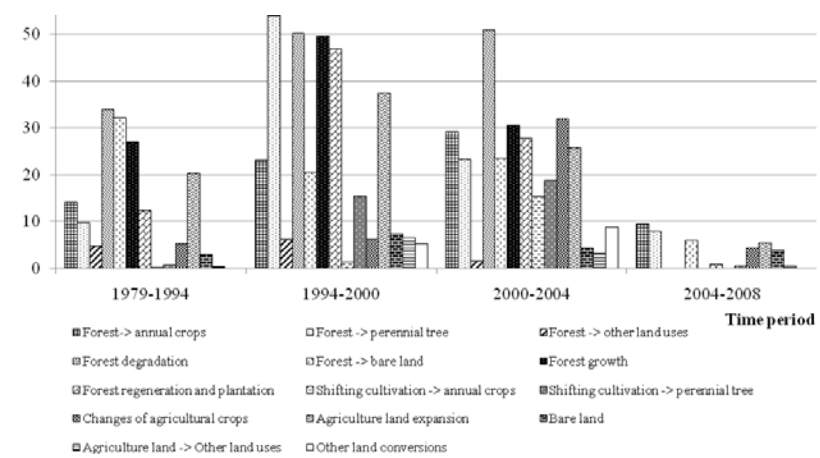


*Figure 4.10 Land-use changes in Dak Nong over 20 years (1979-2008)*
*(Source: NIAPP)*

*Abatement costs curves of land-use changes:* In general, land-use changes can be either carbon emission or carbon sequestration. The estimated cumulative emissions for 1994-2000 were as much as during 2000-2004, but six times higher than during 2004-2008 (see horizontal excel of the curves, Figure 4.11).

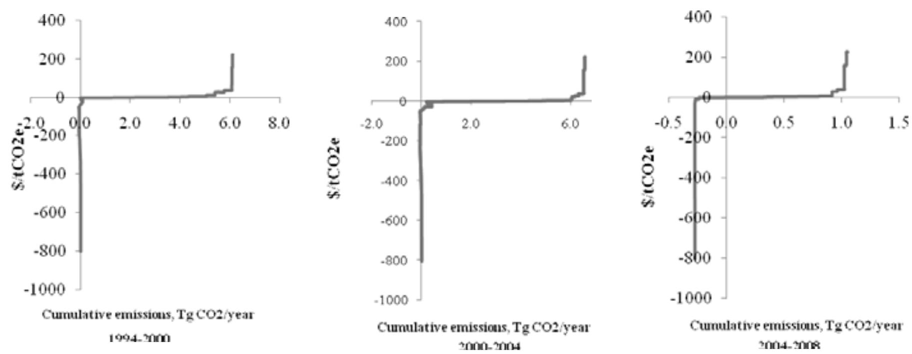


*Figure 4.11. Opportunity cost curves of land-use changes in Dak Nong over 15 years (at the discount rate of 10% per year). The curve on the left is for 1994-2000, in the middle for 2000-04 and the right for 2004-08)*

The majority of the land-use changes generated less than USD 5.30 per $tCO_2eq$ lost. Such low-price carbon emissions were due to deforestation and degradation and contributed to the majority of total carbon lost from the landscape. The former was from conversion of natural forest and planted forest to low carbon annual crops and some perennial crops like cashew and pepper, while the later was contributed by converting medium forest to poor forest and young forest/regrowth. Deforestation due to conversion from natural forest to coffee and rubber plantations resulted in the highest carbon abatement cost, up to USD 224.10 per $tCO_2eq$ lost when poor forest was converted to rubber plantation, owing to the very high economic benefit of these two crops. In this context, deforestation for rubber and coffee plantations in Dak Nong seemed to be unstoppable since these land-use conversions return very high economic profitability, while deforestation for annual crops and cashew and pepper could have been prevented by the carbon market.

It is interesting that, in this period of time, a number of land-use transitions gained both economic value and carbon stock, resulting in negative abatement costs as high as USD 804.50 per $tCO_2eq$ (conversions of pepper and other perennial crops to rubber plantation). Conversion of annual crops including shifting cultivation to coffee and rubber plantation, although generating lower economic value, also helped to improve carbon stock of other landscape.

### 4.2.4 Discussion and conclusions

*4.2.4.1 Assessment of land-use change with a focus on forest land-use changes*

Results from the case study in Dak Nong present a land-use trend that shows that shifting cultivation and industrial perennial crops are advancing at the expense of the natural forest for production and natural forest for protection. Rich forest is mainly kept intact owing to the fact that the majority of the natural forest in Dak Nong is located in national parks and is well protected. Instead, the medium and poor forest is being converted to other land uses. Parts of this land-use change can be blamed on inadequate land-use planning and management as well as failure to impose policies. When a policy does not comply with its objectives, the policy itself is a failure. However, a failed policy doesn't necessarily mean that the implications of that policy are bad. To be able to evaluate the policy you need to apply a scientific approach and understand the basis for the policy. This report suggests and provides options for policy evaluation, such as the application of remote sensing and opportunity cost analysis.

The land-use trend can be divided into a long-term trend, from 1979 to 2005, and a short-term trend from 2004 to 2008. The short-term trend for industrial plantations showed that the expansion of rubber plantations are done at the expense of, not only natural poor forest as is mandated in policy, but even more so for natural medium forest. Since the long-term trend shows that rich natural forests are being degraded and turned into, amongst other uses, medium and poor forest, the combination of results shows that during a ten-year period rich natural forest has, through degradation, been converted into rubber plantations.

Shifting cultivation, that is, clearing natural forest for agriculture, shows an increasing trend up until the year 2000 and then a gradually decreasing trend to 2008. The short-term analysis shows that between 2004 and 2008 the largest change in shifting cultivation was the transformation from shifting cultivation to bare land. Up until 2000, shifting cultivation was a way to subsist, but for the latest 10 years shifting cultivation has evolved into being seen as an investment. The whole procedure is unofficial and includes clearing of land, which is later ‹sold› to make profit (as reported in a stakeholders' meeting). When the trends are combined, analysis of shifting cultivation shows that it still plays an important role in land-use conversion and, owing to the change of cause, the continuing clearing of natural forest for bare land is an important concern.

Another concern of land-use conversion is for use as coffee plantations, which has increased from zero to just below 90,000 ha since 1979. It is the perennial crop with the highest dependence on water resources. In a province that already suffers from increases in temperature with accompanying water stress, and with hydropower plants as the main source of energy, the availability of water is crucial, both for the economy and the environment. The environmental services delivered by forest, such as protection of water resources, needs to be valued and taken into account at all levels in land-use planning and in the implementation of land-use policies. Awareness of, and respect for, the close links between water and land use is in the best interests of business developers, local communities and the regional government.

These findings, the combination of long- and short-term trends and a full landscape approach, are only possible when the REALU methodology and perspective is applied and there is sufficient, consistent and reliable data to base the analysis on.

*4.2.4.2 Defining causes and drivers of the main land-use changes as well as the underlying reasons for changes*

As can be seen in the results, the causes of deforestation in Dak Nong are numerous. In this report we are approaching the drivers from various angles including stakeholder consultation, land-use rights analysis, remote sensing data and modelling. The driver discussion is multilevel and shows that the pure physical drivers of land-use change in Dak Nong are the expansion of shifting cultivation and industrial perennial crops into the natural forest. Stakeholder consultation and land tenure analysis provides us with the causes of the expansion. The stakeholders mentioned inadequate land-use planning and poor land-use management as the main drivers, as well as high financial revenues from perennial crops, rapid immigration and unclear land tenure rules. The use-right analysis showed the weakness of economic organizations in preserving natural forest, while households have taken over the responsibility for increased areas under shifting cultivation and perennial crops.

The report highlights the difficulties in providing comprehensive land-use planning when input data is inconsistent. We believe that by including land-use trends (co-governance), consistent data and new methods (such as remote sensing and opportunity cost analysis) land-use planning can improve and be sustainable. Only then we can guarantee accountability and transparency of REDD. Land-use planning can, in a country such as Vietnam, play an important role for the design of a fair and efficient REDD mechanism. The land-use plan defines "expected performance standards" for environmental services, including carbon, and can therefore be considered as the baseline for an additionality assessment. If the province complies with the land-use plan, which evidently has difficulties with enforcement, the province would have to decrease emissions even further for it to be additional.

Planning for a realistic REDD implementation needs to use multiple land-use planning parameters and different layers of selected parameters that do not limit economic benefits or environmental protection. The analysis should include several layers within each parameter with a nuanced trade-off between financial parameters and environmental conservation. The environmental parameters will include not only carbon, but other environmental co-benefits, particularly water owing to its very important role in Dak Nong. At which breaking point between economy and environmental protection does Dak Nong and Vietnam benefit the most? When it comes to the recommended land-use classification alterations, policy makers should not only base the transformation on recent developments in climate change negotiations, but look at the whole picture and national as well as local stakeholders and what would be most beneficial in the long run.

*4.2.4.3 Advantages and limitations of tools used, including remote sensing, opportunity costs analysis, OPCOST, and stakeholders' consultation*

The land-use change matrix, which was created from remote sensing analysis, was a very useful visual tool for trends analysis in defining drivers of deforestation and degradation. The opportunity cost model presented a visual interpretation of the environmental and financial costs together with the origin of land-use-based $CO_2$ emissions. The model can also function as a tool to show opportunities to balance economic growth with carbon-rich land-use, which includes all land uses, putting the model in line with REALU. The model offers a tool for science-based policy making, that is, land-use planning. It helps to build scenarios of the economic benefits of land use and land-use changes for predicting future emissions. However, it should be borne in mind that the model only considers carbon stock and economic benefits and excludes other co-benefits resulting from land-use conversion or conservation, for example, biodiversity, water and social values. The data inputs, including measuring carbon stock and NPV, can be costly and the remote sensing data necessary is not always available.

Stakeholders' consultation using brainstorming techniques complemented the remote sensing and opportunity cost analysis methods. The consultation helped us to understand the root causes of drivers as well as the impacts of land conversion. With such knowledge, actions can be more efficiently planned. Owing to shortage of time, the stakeholders consulted in this study were limited to local policy makers and professionals. The findings represent only public knowledge, which pronounces mainly on environmental concerns. It is recommended that perspectives from land users should be investigated to provide a more comprehensive knowledge system.

*4.2.4.4 REDD-REALU implication of this study*

The results in this report show that with additional financial input, some of the investigated land-use change could theoretically have been avoided. Within the REDD discussion, the avoidance of theoretical historical emissions are of less importance compared to the suitability for REDD in a certain area. The opportunity cost analysis can function as a compass aiming at the most suitable area for REDD implementation. The results show that in the case of Dak Nong, the historical deforestation and degradation has made the province unsuitable for REDD implementation because there is not enough natural forest left that can generate money for conservation. However, with the aid of REDD finance, other options that would be more suitable for Dak Nong can be implemented. These include actions of carbon enrichment in production landscapes, that is, agroforestry, which in turn could generate rewards for environmental services. By comparing opportunity cost analysis from various areas across Vietnam, the most suitable area for REDD implementation could be identified.

# Chapter 5
# Rights, resource access and tenure

The design and success of REDD schemes depends on the rights to access resources and the tenure of parties involved since these factors determine the institutional arrangements of REDD payment mechanisms and distribution. This chapter analyses forest tenure systems in Vietnam and highlights opportunities and constraints for future implementation of REDD in the country, with a particular focus on a payment distribution system. Based on this analysis, different payment mechanisms are discussed and their strengths and weaknesses are highlighted. This serves as useful inputs for future dialogue and negotiation for REDD in Vietnam.

## 5.1 FOREST LAND TENURE SYSTEM

The latest data of forest cover in the country shows that the total forest area is around 13.1 million ha, 80% of which is natural forest and the remaining 20% plantation forest (Table 5.1). Forests are classified into three types according to their management objectives.

- Special-use forest, which is set aside from agricultural and forestry production for the protection of floral and faunal genetic resources. Financial resources for the management of special-use forest areas mainly come from the national (for the eight national parks under MARD) and the provincial (in most cases) governments.

- Protection forest, which protects the medium critical and less critical watershed forests. Financial resources for management of protection forest come from: (i) the annual state budget for forest protection, but this is limited and usually has to be stretched to cover large areas; (ii) provincial budgets, which vary from province to province because of differences in their financial status; and (iii) national programs.

- Production forest, which designates reforestation and agroforestry production. Production forest owners are supposed to be self-financing through the appropriate use of forest resources. At present, state forest enterprises are the largest owners of production forest and the forest under their management is often of higher quality than that managed by other owners.

All forests, according to the Constitution of Vietnam, are under the ownership of the people, and the state on the behalf of the people manages the land and legally entrusts the management of the land to specific groups. The recent Land Law (2004) recognises eight different groups managing the land.

1. State-owned companies (formerly state forest enterprises)
2. Management boards of protection forest
3. Management boards of special-use forest (mainly protected areas such as national parks)
4. Individual households
5. Village community
6. People's committees
7. Joint-ventures
8. Army

The areas of forest managed by these eight groups have changed from year to year but recent data (for 2008) show that the first six groups manage most of the forests in Vietnam while the last two groups manage only a small amount. More than 50% of natural forest is managed by state companies and management boards; households manage 18.4%; and communities manage 1%. More than 20% of natural forest is still under people's committees (Table 5.1). In general, the best quality forests are usually owned by state actors while non-state actors, particularly local people, have mostly been allocated poorer and degraded forests.

While the main goal of having different groups managing forests is to ensure effective forest management practices (Do and Le 2001), challenges identified with the current forest tenure system in Vietnam are associated with (i) overlapping forest tenure arrangements on the ground, (ii) confusion over rights that undermines the efforts of forest tenure reform and (iii) unclear impact of forest tenure reform on poverty alleviation (Nguyen and others 2008). Moreover, in principle, by law, all forest owners are entitled to the benefits from their forest. However, in practice, most individual owners are disadvantaged by organizational owners (both state and private) in gaining access to forest benefits. Individual households owning forest find it difficult to acquire legal logging permits, so they collect timber without permits (Nguyen 2005). Similarly, legal permission to use forest land for cultivation is also difficult to obtain and most individual forest owners use forest land for agricultural purposes without a legal permit (Nguyen 2005).

For REDD to be implemented, these challenges should be addressed at both macro- and micro-level.

*Table 5.1. Areas of forest under different groups of actors until the end of 2008*

| Forest types | Total area | State-owned companies | PAMBs | Other economic entities | Household | Community | Other Organiza-tions | Army | PC (not yet allocated) |
|---|---|---|---|---|---|---|---|---|---|
| **I. Forestland with forest** | 13,118,773 | 2,105,662 | 4,398,711 | 85,505 | 3,150,450 | 140,648 | 459,809 | 240,548 | 2,537,441 |
| A. Natural forest | 10,348,591 | 1,634,848 | 3,900,012 | 24,451 | 1,902,771 | 112,489 | 414,944 | 196,458 | 2,162,619 |
| 1. Timber forest | 8,221,164 | 1,348,265 | 3,169,753 | 16,195 | 1,370,891 | 95,766 | 308,129 | 146,319 | 1,765,846 |
| 2. Bamboo | 641,331 | 123,674 | 155,525 | 3,281 | 170,965 | 5,901 | 30,704 | 11,232 | 140,048 |
| 3. Mixed forest | 687,080 | 143,281 | 255,082 | 4,829 | 112,727 | 5,078 | 8,876 | 36,687 | 120,522 |
| 4. Mangrove | 59,760 | 9,610 | 32,719 | - | 3,580 | - | 1,673 | 302 | 11,877 |
| 5. Rocky mountain forest | 739,255 | 10,018 | 286,933 | 145 | 244,608 | 5,744 | 65,563 | 1,918 | 124,325 |
| **B. Plantation forest** | 2,770,182 | 470,814 | 498,699 | 61,054 | 1,247,679 | 28,159 | 44,865 | 44,090 | 374,823 |
| 1. Plantation with timber stand | 1,305,172 | 242,353 | 295,546 | 32,884 | 494,135 | 19,599 | 23,881 | 22,539 | 174,235 |
| 2. Plantation w/o timber stand | 1,155,132 | 203,855 | 167,731 | 24,045 | 559,489 | 8,002 | 18,097 | 20,704 | 153,208 |
| 3. Bamboo | 89,847 | 3,733 | 1,793 | 1,270 | 78,896 | - | 724 | 90 | 3,342 |
| 4. Plantation for special products | 207,122 | 19,202 | 32,467 | 2,854 | 109,342 | 558 | 2,007 | 481 | 40,211 |
| 5. Mangrove | 12,909 | 1,672 | 1,161 | - | 5,817 | - | 156 | 276 | 3,827 |

Source: http://www.kiemlam.org.vn/Desktop.aspx/News/So-lieu-dien-bien-rung-hang-nam/Nam_2008/

## 5.2 POTENTIAL REDD BENEFITS AND DIFFERENT FOREST USER GROUPS

As the forest owners and managers, the above eight groups are eligible to receive REDD payment if they protect forests from deforestation and degradation. Nevertheless, due to their unique characteristics, power and institutional arrangements, REDD payments and benefit-sharing mechanisms selected and applied for them are different and reveal both opportunities and constraints, which will be discussed in detail. Due to limited information on the current management status, as well as the fact that only small areas of forest are managed by joint-venture and army units, this report only discusses the implications for the first six groups, while encouraging further research on the last two groups of forest users.

### 5.2.1 State-owned companies

State-owned companies (formerly state forest enterprises (SFEs) often manage forests for long-term uses (50 years). All state forest enterprises have contracted land to households, individuals and organizations to protect forests located close to communities[21]. Contracted households receive funds for forest protection and are obliged to protect forests. Despite the government's efforts in restructuring the state forest enterprises, many of them have still been unable to restructure into state forest companies operating independently from the state budget (UN-REDD and MARD 2010). This is the reason for the large area of forest remaining in the hand of state forest enterprises (UN-REDD and MARD 2010). Their management of large areas of forest in the country means that this group will be one of the major sellers in any REDD scheme in Vietnam, hence, will have access to a major proportion of payments. On one hand, the good practices of previous state forest enterprises in bringing individual households together in effective forest management should be adapted in future REDD schemes. On the other, the weaknesses of this management style, such as unclear identification of forest boundaries, weak links between management and development objectives and unsustainable practices (Nguyen 2006), should be avoided. In addition, economic incentives from REDD may undermine the current reform process of becoming state-owned companies as this group often wants to hold on to the land, hence they might not want to involve householders in REDD schemes.

### 5.2.2 Management boards of protection forest

A management board for protection forest is set up to manage a protection forest of more than 5,000 ha. Protection forests are often managed directly by management boards (MBs) of the government for unspecified periods of time. MBs operate with funding from the government. To protect forests, MBs might sign a forest protection contract with local households who then receive payments from MBs in return. In the UN-REDD pilot site in Lam Dong province, for example, all forest at the pilot site was managed by MBs that contract forest protection duty to

---

21 http://www.fao.org/docrep/003/x6898e/x6898e03c.htm

individual households. MBs will be allocated a budget derived from the Forest Protection and Development Fund, which sits at provincial level, to cover such costs. The experiences so far in Lam Dong province show that this channel of payment seems to be effective and more studies on similar payment approaches should be conducted in other areas to confirm their sustainability.

#### 5.2.3 Management boards of special-use forest (mainly protected areas such as national parks)

When a special-use forest is more than 1,000 ha, an MBSF can be established to manage it. In Vietnam, special-use forests are managed by state agencies. Special-use forest management boards directly manage, protect and develop forests. Contracts are made on a long-term basis (usually 50 years) with households in ecological restoration and administrative sub-areas for afforestation and protection. Households are entitled to collect dead wood for their own use provided that they do not damage the integrity of the forest ecosystem. Since special-use forests are mainly national parks and protected areas, their operational costs mainly come from the state budget. REDD payments for this group, therefore, should also be channelled through the existing system. Similarly to the case of management boards of protection forests, MBSF can also obtain access to REDD funding via the Forest Protection and Development Fund, which sits at provincial level.

#### 5.2.4 Individual households

Individual households are the second largest owners of production forest. Although this group has only recently been given legal forest ownership, they have proved to be more effective than state forest enterprises in managing their forests (Nguyen 2006). In general, arranging REDD contracts with households has numerous advantages. Firstly, it provides a strong incentive for entrepreneurial households to protect forest in order to derive higher income. Secondly, it effectively binds environmental services buyers and sellers under a legal contract. Individual households can benefit from REDD payments directly and indirectly.

***Indirectly.*** Individual households can be contracted by MBs who will potentially receive most of REDD funding to protect and manage forests. While this contractual arrangement provides local households with benefits derived from their services, it does not necessarily guarantee a long-term benefit to local households. This triggers some concern from the public that greedy management boards with legal title over forest may not want to share benefits derived from services to local households, preferring to retaining benefits for themselves. Long-term contractual arrangements have to be created in order to make sure local people are able to benefit from the services. While this idea looks appealing for local people, it may meet resistance from MBs. If this is the case, REDD payments would not be pro-poor.

***Directly.*** If REDD payments are made directly to a household, all households with forest land, many of which are poor, will be able to derive some benefit from the forest. However, direct payment to individual households is confronted by numerous barriers. First, transaction costs for REDD will be high since the scheme has to deal with a large number of small and fragmented households. Second, actual size of the land allocated to household and the size indicated on the household's land-use certificates are often mismatched, leading to conflicts amongst households and between households and buyers in payment amounts. These two challenges have been well-illustrated in the case of Son La province where piloting policy on payment for forest ecosystem service was implemented and produced numerous difficulties for the government in distributing payments to individual households.

Another problem associated with direct REDD payments to individual households is that households without forests are entirely excluded from the payment scheme. This will not only have significant impact on current generations but also future ones. To (2007) and Hoang and others (2008) pointed out that although the livelihoods of newly established households (young couples or recently married couples) depend mainly on forest land and resources, they often do not have access to land because all forest land was already allocated to existing households in the area. Such landless people are not only the ones created after the allocation but also those who moved to the village after the land had been allocated. Moreover, Hoang and others (2008) state that poor households also do not have access to the land and hence might not be able to benefit from REDD. It is more complicated in some areas, like Ban Yen in Hoa Binh province, because even when such local households were given a chance to access forest, they did not want forest that is far away from the village as they would not be able to patrol the forest and would fail to prevent illegal timber logging exercised by outsiders (To 2007).

### 5.2.5 Village community

Recent years have seen a shift towards community forest management, with rights over forest and forest resources being transferred to local communities. Forest allocation to village communities is stipulated in Article 29 of the Law on Forest Protection and Development 2004. In 2006, about 4.4% of forest in the country was managed by the community, an increase from 2.4% in 2005 (Figure 5.1). The increase may be attributed to government policy in restructuring state forest enterprises under which a large amount of forest previously managed by these bodies was shifted to other forest user groups, including the community. However, the area managed by the community dropped to 0.5% of the country's total forest area in 2007. This drop corresponds to the drastic deforestation of natural protection forest in the same period and we can speculate that natural protection forest, particularly in the Highland Plateau, which contributed to a large portion of community forest, was converted to rubber plantation or hydropower.

Experiences and lessons-learned from various projects have served as a foundation for the formal recognition of community as a legal entity entitled to forest management. Studies have shown that local communities have been an effective protection force, with active patrolling inside the forest successfully preventing forest degradation. Despite projects, programs and legislation promoting community forestry, actual forest allocated to village community management is still very small, around 1% of the country's total forest area in 2008 (Figure 5.1). Despite this small percentage, REDD payments to the community has numerous advantages for the REDD scheme, such as reducing transaction costs of dealing with many small individual households, increasing relatively equal access to payments among households in the same group/community, including marginalized households, thus being pro-poor (Figure 5.1).

However, payments to this forest management group faces three major challenges including (i) low incentives for entrepreneurial households as efforts by one entrepreneurial member does not necessarily lead to a higher quality of environmental services; (ii) high risk of contract violation as the sense of compliance amongst community members is not the same; and (iii) under the 2004 Forest Protection and Development Law, communities are eligible to be allocated forest but Vietnam's Civil Code does not recognise local communities as legal bodies. This means that they cannot enter into contractual arrangements (unlike households), which may limit their ability to participate in REDD. Informal institutions (for example, village laws and customary laws) and traditional leadership should be enhanced to deal with this problem. A management model which involves the participation of local organisations in setting up rules and regulations and the local authorities as law enforcement and monitoring parties can also be potential solutions which need to be tested on the ground.

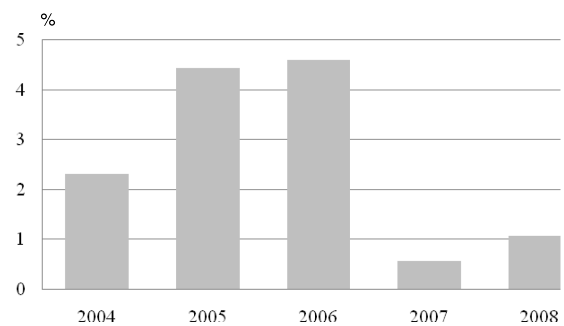


*Figure 5.1 Percentage of forestry land managed by community (Source: kiemlam.org.vn)*

**5.2.6 People's committees**

By the end of 2008, 19.3% of the country's total forest area was in the hands of People's Committees, mainly at the commune level (Table 5.1). About 85% of this area is natural forest and thus high carbon stock. However, in many areas, the committees fail to manage the forest, resulting in so-called open access forest with an accompanying high risk of deforestation and degradation (personal communications with a senior official from Legal Department of MARD, February 2010). One of the reasons for this failure is the lack of human resources and technical capacity in forest management in the committees. The 2004 Land Law states clearly that the committees represent state management over the forests; consequently they cannot be the forest holders. This means that the forest under their control must be allocated to other user groups when REDD is implemented in the country in the future so that the open access problem could be minimized or avoided.

## 5.3 REDD AND INDIGENOUS PEOPLE

A large number of local households with forest are ethnic minorities and dependent on the forest for their livelihoods. Although forestry policies are always reviewed and amended to increase the participation of rural communities and ethnic minorities in forest management through ‹rights of forest owners›, in practice their are difficulties. Owing to limited capacities, language barriers and geographical disadvantages, ethnic minorities are often in disadvantaged situations in relation to opportunities for forest management. The government has recognised this challenge and has actively engaged with, and become involved in, the international arena for indigenous people, such as the UN Declaration on the Rights of Indigenous Peoples and the UN Permanent Forum on Indigenous Issues. Together with this effort, more supportive programs and training which enhance the involvement and voice of indigenous people should be conducted on the ground. Consultations with indigenous people during any REDD program is also essential for its success.

## 5.4 DISCUSSION

### 5.4.1 State agencies have more advantages and opportunities in accessing REDD payments

As shown earlier, 24% of the forest area in the country is directly managed by local households. However, about 40% of the forest area managed by the household is plantation forest with lower carbon stock compared to natural forest. By contrast, 85% of the forest area managed by the state forest companies and management boards are natural and high quality forest. The majority of management agreements of the state with private companies, individuals and local communities tend to be relatively short term (between 10 and 20 years, but often limited to 1-5 years) compared to 50 years granted for state agencies. This means REDD payments based on performance that are channelled to forest companies and management boards will be much larger than those to local households. Given the context of strong leadership in land management in Vietnam, REDD payments should be channelled to these key forest users to reduce the transaction costs of establishing a new institution. However, management practices as well as the capacity of these groups should be strengthened to manage any REDD scheme successfully. Although individual households only directly manage smaller areas of forest, this group can be contracted by state forest enterprises and management boards to protect forest and hence can access REDD payment indirectly. Therefore, an appropriate benefit-sharing mechanism with appropriate rights and resources access for this group should also be implemented. Tran (2004) and Nguyen (2005) suggest that the security of state forest tenure depends on the capacity of the organization in charge of forest management and the existing pressure on the forest resources.

### 5.4.2 REDD and protected areas

The case of Vietnam reinforces the wisdom behind global investments in protected areas as it is a key factor in forest management in developing countries. However, a common problem for protected areas and their management boards is the conflict between conservation and development. Local people living surrounding and within the protected areas often depend on forest resources and, to secure their livelihoods they might make negative impacts on forest resources and affect REDD implementation. This challenge should be addressed in any REDD schemes. Furthermore, there is still much uncertainty regarding the factors influencing effectiveness of protected areas in reducing deforestation and impacts on local livelihoods, and there is a clear need for a detailed assessment of these factors to inform climate change policy. Further research is required into the impact of the interrelationship between protected area status, community involvement and governance within protected areas on forest carbon stores and livelihoods (*Coad and others*. 2008).

### 5.4.3 Formal-informal legal system

Forest owners have legal rights, which are endowed by the state, and informal rights, which are defined and recognised locally. This means that forest users group should not only comply with legal requirements but should also be in line with, and respect, traditional and customary law related to land tenure. Indigenous people and their land management practices should be respected and integrated whenever and wherever necessary to ensure successful REDD implementation.

### 5.4.4 Marginalised groups and pro-poor REDD

As pointed out earlier, the poor and young generation who are often unable to access land resources might be unable to participate in REDD schemes. However, their livelihood depends on forest resources and hence has a negative impact on forest protection activities. How to harmonise between livelihood security for these groups and reducing emissions from deforestation and degradation will continue be a problem for policy makers and researchers.

**Annex 1. List of participants of the first national workshop**

# LIST OF PARTICIPANTS

Reducing Emissions from All Land Uses Workshop
Hanoi, 4 November 2009

| No. | Name | Organisation |
|---|---|---|
| 1 | Nguyen Thi Thu Hong | General Department of Land Administration, Ministry of Natural Resources and Environment |
| 2 | Do Hoang Chung | Thai Nguyen University of Agriculture and Forestry (TUAF) |
| 3 | Ngo Dinh Tho | Research Institute for Sustainable Forest Management and Forest Certification |
| 4 | Pham Thi Thuy Hanh | General Department of Land Administration, Ministry of Natural Resources and Environment |
| 5 | Akiko Inoguchi | FAO |
| 6 | Dao Trung Chinh | General Department of Land Administration, Ministry of Natural Resources and Environment |
| 7 | Do Duc Doi | General Department of Land Administration, Ministry of Natural Resources and Environment |
| 8 | Doan Diem | Vietnam Forest Science and Technology Association |
| 9 | Nguyen Ngoc Lung | Research Institute for Sustainable Forest Management and Forest Certification |
| 10 | Huynh Van Keo | Bach Ma National Park |
| 11 | Vu Thai Truong | Care International |
| 12 | Pham Minh Uyen | Royal Netherlands Embassy |
| 13 | Le Thanh Xuan | Department of Registration and Statistics, General Department of Land Administration, Ministry of Natural Resources and Environment |
| 14 | Hoang Thi Van Anh | General Department of Land Administration, Ministry of Natural Resources and Environment |
| 15 | Timothy Holland | SNV |

| No. | Name | Organisation |
|---|---|---|
| 16 | Dao Thi Bach Lien | General Department of Land Administration, Ministry of Natural Resources and Environment |
| 17 | Nguyen Phu Hung | Forest Inventory and Planning Institute |
| 18 | Nguyen Thi Yen | CARE |
| 19 | Vo Dai Hai | Forest Science Institute of Vietnam |
| 20 | Nguyen Bich Hang | Forest Sector Support Partnership |
| 21 | Le Anh Ngoc | Department of International Cooperation, Ministry of Natural Resources and Environment |
| 22 | Richard McNally | SNV |
| 23 | Pham Thu Thuy | Ph.D candidate, Charles Darwin University |
| 24 | Hoang Thi Minh Ha | Country Coordinator, World Agroforestry Centre (ICRAF), Vietnam |
| 25 | Do Trong Hoan | Technical Assistant, World Agroforestry Centre (ICRAF), Vietnam |

**Annex 2: List of participants of the mini-workshop in Dak Nong province**

# LIST OF PARTICIPANTS

Reducing Emissions from All Land Uses (REALU) Workshop
Gia Nghia Town, Dak Nong province, 14 April 2010

| Order | Name | Organisation |
|---|---|---|
| 1 | Nguyen Xuan Anh | Division of Natural Resources and Environment of Dak Mil District, Dak Nong province |
| 2 | Le Kim Minh | Department of Forestry, Dak Nong province |
| 3 | Truong Thi My Hoa | Department of Industry and Trade, Dak Nong province |
| 4 | Nguyen Tan Tai | Department of Planning and Investment, Dak Nong province |
| 5 | Luu Van Long | Department of Natural Resources and Environment, Dak Nong province |
| 6 | Vo Duy Nam | As above |
| 7 | Le Duy Tu | As above |
| 8 | Nguyen Viet The | As above |
| 9 | Nguyen Quoc Viet | As above |
| 10 | Bui Thanh Ha | As above |
| 11 | Tran Viet Ha | Land Registration Agency |
| 12 | Le Quang Bao | DONRE |
| 13 | Pham Ngoc Vu | Environmental Protection Agency |
| 14 | Nguyen Thi Hoa | Division of Natural Resources and Environment of Tuy Duc District, Dak Nong province |
| 15 | Ta Duc Trac | Department of Natural Resources and Environment, Dak Nong province |
| 16 | Tran Thi Anh | Office of People›s Committee of Dak Nong province |

| Order | Name | Organisation |
|---|---|---|
| 17 | Duong Van Quyen | Department of Measurement and Statistics |
| 18 | Pham Duc Anh | Administrative Office, Department of Natural Resources and Environment, Dak Nong province |
| 19 | Truong Thi Thien Huong | Division of Environment Protection, Dak Nong province |
| 20 | Tran Thi Minh Chau | As above |
| 21 | Nguyen Duc Loc | As above |
| 22 | Truong Thi Dam Tuyet | As above |
| 23 | Tran Thi Ha | As above |
| 24 | Nguyen Van Thanh | Division of Natural Resources and Environment of Dak Rlap District, Dak Nong province |
| 25 | Truong Van Hien | Director, Department of Natural Resources and Environment, Dak Nong province |
| 26 | Hoang Thi Kim Dung | Deputy Director, Department of Natural Resources and Environment, Dak Nong province |
| 27 | Pham Ngoc Thanh Le | General Department of Land Administration, Ministry of Natural Resources and Environment |
| 28 | Pham Thuy Hanh | As above |
| 29 | Hoang Thi Van Anh | As above |
| 30 | Hoang Thi Minh Ha | Country Coordinator, World Agroforestry Centre (ICRAF), Vietnam |
| 31 | Do Trong Hoan | Technical Assistant, World Agroforestry Centre (ICRAF), Vietnam |

**Annex 3: List of participants of the second national workshop**

# LIST OF PARTICIPANTS

Reducing Emissions from All Land Uses: An approach toward REDD/REDD+
and National Appropriate Mitigation Action (NAMA) Workshop
Tam Dao, 27 April, 2010

| No. | Name | Position | Organizations |
|---|---|---|---|
| 1 | Ms Akiko Inoguchi | Program Officer - Forestry | Food and Agriculture Organization of the United ations |
| 2 | Ms Derin Henderson | Climate Change Adviser | OXFAM Quebec |
| 3 | Mr Vu Minh Duc | Development Adviser | Royal Norwegian Embassy |
| 4 | Ms Do Thi Huyen | Program Analyst | UNDP |
| 5 | Mr To Xuan Phuc | Southeast Asia Analyst | Forest Trend, Vietnam |
| 6 | Ms Nguyen Thi Bich Thuy | Conservation Finance Manager | Asia Regional Biodiversity Conservation Program (ARBCP) |
| 7 | Mr Tran Huu Nghi | TBI-VN Program Manager | Tropenbos International Viet Nam (TBI-VN) |
| 8 | Mr Vu Van Trieu | Senior consultant | Centre for Sustainable Rural Development (SRD) |
| 9 | Ms Le Thi Thu Huong | Program Coordinator | Embassy of Finland |
| 10 | Mr Nguyen Viet Dung | Deputy Director | Pan Nature |
| 11 | Mr Steven Swan | | Fauna and Flora International Vietnam |
| 12 | Mr Nguyen Van Minh | Project Manager | KfW Bankengruppe |
| 13 | Mr Vu Thai Truong | | CARE International in Viet Nam |
| 14 | Mr Nguyen Van Minh | Deputy Secretary General | Vietnam Association of Rural, Farmer Entrepreneurs and Farm-owners (VARFEF) |
| 15 | Mr Phung Tuu Boi | Commissioner | Forestry Science and. Technology Association VIFA) |
| 16 | Mr Đang Hoang Giang | Secretary General | Vietnam Cashew Association (VINACAS) |

| No. | Name | Position | Organizations |
|---|---|---|---|
| **Associations, NP, Universities and Institutes** | | | |
| 17 | Mr Le Khac Triet | President | Vietnam Association of Rural Small and Medium Enterprises (VARISME) |
| 18 | Mr Tran Van Thanh | Director | Cat Tien National Park, Đong Nai |
| 19 | Mr Huynh Van Keo | Director | Bach Ma National Park, Hue |
| 20 | Dr Nguyen Huu Ngu | Lecturer | Hue University of Agriculture and Forestry (HUAF) |
| 21 | Mr Tran Quoc Hung | Dean - Faculty of Forestry | Thai Nguyen University of Agriculture and Forestry (TUAF) |
| 22 | Mr Pham Xuan Hoan | | Vietnam Forestry University (VFU) |
| 23 | Ms Do Thi Ngoc Bich | Deputy Manager - Planning Department | Vietnam Forestry University (VFU) |
| 24 | Mr Nguyen Hoang Tiep | Officer | Forest Science Institute of Vietnam (FSIV) |
| 25 | Ms Phan Thi Thuy Huong | Officer | Center for Environment Research, Education and Development (CERED) |
| 26 | Mr Mai Ky Vinh | MA in Natural Resources Management | Forest Inventory & Planning Institute (FIPI) |
| 27 | Mr Nguyen Lanh | Department of Climate Change, Sea and Islands | Institute of Strategy and Policy on Natural Resources and Environment |
| 28 | Ms Dinh Thu Trang | General Co-ordination Office | Institute of Strategy and Policy on Natural Resources and Environment |
| 29 | Mr Nguyen Thang | Department of Forecast & Strategy | Institute of Strategy and Policy on Natural Resources and Environment |
| 30 | Mr Luu Duc Dung | Researcher | Institute of Strategy and Policy on Natural Resources and Environment |
| 31 | Mr Do Dinh Chien | Director | Institute of Meteorology, Hydrology and Environment (IMHEN), MONRE |

| No. | Name | Position | Organizations |
|---|---|---|---|
| 32 | Ms Nham Thi Lan Huong | Officer - International Cooperation Department | Institute of Land Administration Research - General Department of Land Administration (GDLA) |
| 33 | Mr Nguyen Van Liem | Deputy Director | Agriculture Meteorology Research Centre - Institute of Meteorology, Hydrology and Environment (IMHEN) |
| 34 | Ms Nguyen Thi Thu Thao | | Institute of Science for Environmental Management (ISEM) |
| 35 | Mr Chu Van Trong | | Forest Science Institute of Vietnam (FSIV) |
| 36 | Mr Phan Minh Sang | Researcher | Forest Science Institute of Vietnam (FSIV) |
| 37 | Ms Nguyen Thi Thuy | | Forest Science Institute of Vietnam (FSIV) |
| 38 | Ms Nguyen Thi Lan Anh | | Forest Science Institute of Vietnam (FSIV) |
| 39 | Mr Nguyen Tuan Linh | | Forest Science Institute of Vietnam (FSIV) |
| 40 | Tran Duc Tung | Chief of the Secretariat | Vietnam Pepper Association (VPA) |
| 41 | Mr Nguyen Tien | Director | Kombite |
| | | | |
| **DARD and DONRE** | | | |
| 42 | Mr Luong Van Ngu | Deputy Director | Lam Dong DONRE |
| 43 | Mr Do Ngoc Duyen | Deputy Director - DARD | Forest Protection Department of Dak Nong Province |
| 44 | Mr Truong Van Hien | Director | Dak Nong DONRE |
| | | | |
| **MARD** | | | |
| 45 | Mr Pham Manh Cuong | General Department of Forestry | General Department of Forestry - MARD |
| 46 | Ms Nguyen Thanh Xuan | | Institute of Agricultural Planning and Projection (NIAPP) - MARD |

| No. | Name | Position | Organizations |
|---|---|---|---|
| | | | |
| **MONRE** | | | |
| 47 | Mr Nguyen Khac Hieu | Deputy Director General | Department of Meteorology, Hydrology and Climate Change (DMHCC), MONRE |
| 48 | Ms Le Mai Thanh | Officer - Department of Science Technology & International Cooperation | Department of Meteorology, Hydrology and Climate Change (DMHCC), MONRE |
| 49 | Ms Nguyen Thanh Hai | Officer - Department of Science Technology & International Cooperation | Department of Meteorology, Hydrology and Climate Change (DMHCC), MONRE |
| 50 | Mr Pham Minh Khoa | | Department of Meteorology, Hydrology and Climate Change (DMHCC) |
| 51 | Quach Tat Quang | Acting Director | Ozone Protection Center, Department of Meteorology, Hydrology and Climate Change (DMHCC), MONRE |
| 52 | Ms Pham Thi Nguyet Nga | Officer | Vietnam Environment Administration (VEA) |
| 53 | Ms Hoang Thi Van Anh | Manager - Department of Scheme II | Department of Land use Planning, General Department of Land Administration (GDLA) |
| 54 | Ms Pham Thi Thuy Hanh | Officer - Department of & International Cooperation & Science Technology | General Department of Land Administration (GDLA) |
| 55 | Ms Hoang Thanh Thuy | Manager - Department of Planning & Finance | Administrative Office - MONRE |
| 56 | Ms Pham Phuong Lan | ISGE Accountant | Administrative Office - MONRE |

| No. | Name | Position | Organizations |
|---|---|---|---|
| 57 | Phan Thi Thanh Hien | Personel Department | MONRE |
| 58 | Đoan Thi Thu Hoai | Labour Union | MONRE |
| 59 | Mr Nguyen Xuan Bao Tam | Deputy Director | International Cooperation Department, MONRE |
| 60 | Mr Nguyen Tien Cuong | Officer | International Cooperation Department, MONRE |
| 61 | Ms Nguyen Thi Kim Hao | Officer | International Cooperation Department, MONRE |
| 62 | Mr Chu An Khoa | Officer | International Cooperation Department, MONRE |
| 63 | Ms Nguyen Thi Cam Uyen | Officer | International Cooperation Department, MONRE |
| | | | |
| **ISGE and ICRAF** | | | |
| 64 | Mr Ngan Ngoc Vy | ISGE Coordinator | MONRE |
| 65 | Mr Le Van Diem | ISGE Communication Officer | MONRE |
| 66 | Ms Vu Thi Kim Phuong | ISGE Secretary | MONRE |
| 67 | Ms Hoang Thi Minh Ha | Country Representative | World Agroforestry Centre |
| 68 | Mr Do Trong Hoan | Officer | World Agroforestry Centre |
| 69 | Mr Pham Duc Thanh | Accountant | World Agroforestry Centre |
| 70 | Ms Matilda Palm | Officer | World Agroforestry Centre |
| | | | |
| **Facilitator** | | | |
| 71 | Ms Hoang Thi Thu Huong | Translator | |
| 72 | Ms Pham Lan Phuong | Translator | |
| 73 | Mr Nguyen Van Phien | Technician, responsible for translating system | Nguyen Le Company |
| | | | |
| **Media** | | | |
| 74 | Mr Pham Xuan Hop | Reporter | Natural Resources and Environment News |

This document is part of a series of national reports on Reducing Emissions from All Land Uses (REALU) , based on research and analysis conducted in 2009-2010. The report aims to disseminate interim results and stimulate feedback from the scientific community.

Correct citation

Hoang MH, Do TH, van Noordwijk M, Pham TT, Palm M, To XP, Doan D, Nguyen TX, Hoang TVA. 2010. An Assessment of opportunities for reducing emissions from all land uses – Vietnam preparing for REDD. Final National Report. ASB Partnership for the Tropical Forest Margins. Nairobi, Kenya. 85 p.

Contacts:

World Agroforestry Centre in Vietnam
ICRAF Vietnam Office
No.1 Lô 14A, Trung Yen 3 Street, Trung Yen Area,
Yen Hoa ward,
Cau Giay District, Hanoi, Vietnam
Tel and fax: +84 3783 4645
Email: icraf-vietnam@cgiar.org
www.worldagroforestry.org/sea/vn

ASB Partnership for the Tropical Forest Margins,
P.O. Box 30677 - 00100 Nairobi, Kenya
Tel. +254 20 7224000
Email: asb@cgiar.org
www.asb.cgiar.org

The views expressed in this publication are those of the author(s) and not necessarily those of the World Agroforestry Centre.

This publication may be quoted or reproduced without charge, provided the source is acknowledged.

All images remain the sole property of their source and may not be used for any purpose without written permission of the source.

© 2010 ASB Partnership for the Tropical Forest Margins

**Other reports in this series**

van Noordwijk M et al. 2010. Opportunities for Reducing Emissions from All Land Uses in Indonesia: Policy Analysis and Case Studies.

Robiglio V et. al. 2010. Reducing Emissions from All Land Uses in Cameroon. Final National Report

Velarde SJ et. al. 2010. Reducing Emissions from All Land Uses in Peru. Final National Report.

**Related Publications**

van Noordwijk M, Minang PA, Dewi S, Hall J, Rantala S. 2009. Reducing Emissions from All Land Uses (REALU): The Case for a whole landscape approach. ASB PolicyBrief 13. ASB Partnership for the Tropical Forest Margins, Nairobi, Kenya.

Velarde SJ, van Noordwijk M, Suyanto (eds). 2009. Perceptions of Fairness and Efficiency of the REDD Value Chain. ASB Policy Brief No. 14. ASB Partnership for the Tropical Forest Margins, Nairobi, Kenya.

Van Noordwijk M and Minang PA. 2009. "If we cannot define it, we cannot save it" ASB PolicyBrief No. 15. ASB Partnership for the Tropical Forest Margins, Nairobi, Kenya.

Ekadinata A; van Noordwijk M; Dewi S and Minang P A. 2010. "Reducing emissions from deforestation, inside and outside the 'forest'". ASB PolicyBrief 16. ASB Partnership for the Tropical Forest Margins, Nairobi, Kenya.

All publications available at www.asb.cgiar.org

This report presents results from a project carried out in Vietnam to assess the potential of reducing carbon emissions from all land sues, rather than only from deforestation and degradation of forests.

The study explored the links between reducing emisisons from all land uses and nationally appropriate mitigation actions (NAMAs), as well as market-based approaches to the problem.

The study found that reducing emissions from all land uses in Vietnam increases the possibility of sustaining a future carbon emissions reduction scheme because it addresses an entire landscape, not only forest, and strengthens the participation of all land users, including indigenous people.

There are challenges to any scheme that aims to reduce emisisons from all land uses. These include adopting the right methods, obtaining reliable data, and legal and political issues.

The report recommends that reducing emissions from all land uses would be the most effective approach and should be implemented using cross-sectoral land-use planning and co-covernance that includes equitable involvement of government, private companies and smallholders.

World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

SFMI

Norad