



IMPACT IN THE FORESTS

SUMMARY

The potential for business solutions to combat deforestation in large forest landscapes in Asia: a progress report



FOREWORD

The authors of this innovative report remind us that for sustainable forest management to work in the long term it must make business sense as well as ecological sense.

But looking at entrepreneurs on the ground in three Asian countries they note that with the exception of the Forest Stewardship Council (FSC), most innovations are small-scale, low impact and donor-driven. They make the observation (which is painful for us in the forest sector) that there is more innovation in the energy sector. It's clear that there is no lack of committed and innovative entrepreneurs, NGOs and community and indigenous organizations on the ground. The challenge is that the alternative economic approach they promote has traditionally been at cross-purposes with the large-scale development plans of estate crops. We see some hope that this situation is now changing. In the palm oil industry in Indonesia for example, a number of larger companies have made commitments to “zero deforestation, zero social conflict and zero peat”. The sustainability commitments from plantation and forestry sectors have been supported by international buyers and the Indonesian government.

The industry also wants to work with smallholders who provide 40% of Indonesia's palm oil and who urgently need technical assistance to improve planting stock, agricultural methods and business practices. Cooperatives need to be strengthened and access to capital facilitated. This is fertile ground for the entrepreneurial approaches explored by the actors of “Impact In the Forests”. It would have the potential to bring impact at scale that the actors correctly note has been missing to date, to make a real impact on deforestation for the benefit of the forests, people, economies and environment.

Nazir Foad, Head,
Indonesian Peatland Restoration Agency (PRA)

Chris Elliott, Executive Director,
Climate and Land Use Alliance (CLUA)

In the palm oil industry in Indonesia for example, a number of larger companies have made commitments to “**zero deforestation, zero social conflict and zero peat**”. The sustainability commitments from plantation and forestry sectors have been supported by international buyers and the Indonesian government.

EXECUTIVE SUMMARY



© Soh Keon Chng / WWF-Canon

Stripping Cinnamon Bark. Jambi Province, Sumatra, Indonesia.

The “Impact In the Forests” report explores pathways to **unlock business solutions for deforestation-free** trade chains in Asia.

The UN’s 2015 Sustainable Development Goals aim to halt deforestation by 2020. This is unlikely to be achieved by action by the public or civic sector alone.

This report is based on the assumption that developing successful businesses that actively or incidentally help to maintain natural forest cover is a key step to eliminating deforestation. Such businesses will often also contribute positively to address other environmental, social and economic needs. We define deforestation-free business models as any for-profit business enterprise that can *operate without directly or indirectly causing deforestation or forest degradation and/or contribute to forest and land restoration*. Working to kick-start sustainable and scalable business models, which are successful enough to make a significant reduction in deforestation, requires a new approach.

This report is the product of collaboration between four organizations from very different sectors – **WWF** on the environment, **Ennovent** on business innovation, the **Impact Hub** on development of local entrepreneurial ecosystems and **Clarmondial** (in association with GreenWorksAsia) on financing for sustainable development.

It focuses on three key biodiverse countries and landscapes as cases that represent the range of conditions across Asia. These include:

- **Vietnam:** particularly the Central Truong Son area around the Annamite Mountains.
- **Indonesia:** focusing on inland Kalimantan on the island of Borneo, and on the island of Sumatra.
- **Nepal:** particularly in the lowland area that forms part of the transboundary Terai Arc region.

The report provides a situation analysis of the environmental, social and political conditions in each of the landscapes, along with the policy and entrepreneurial context. It discusses the potential for innovative approaches in these landscapes and explores enterprises and sectors that might contribute positively to addressing deforestation. Finally, it looks at the various actors (innovators, investors and connectors) who might be involved. Real-life examples are cited throughout.

The **key findings** are as follows:

1. Across the three focal countries and landscapes, the proportion of enterprises found that directly contribute to reducing pressure on deforestation is very low; and these do not tend to have impact at large scale. Business incentives remain much stronger for promoting deforestation than preventing it.

A range of case studies demonstrate that deforestation-free business solutions do exist and can have impact including:

- Biogas production to replace woodfuel in Vietnam and inclusive business accelerators linked to this

- Sale of water filters to improve health and reduce woodfuel use in Cambodia
- Sustainable rattan production in Lao PDR
- Peatland restoration in Kalimantan
- Harapan forest restoration enterprises in Sumatra
- Sustainable travel enterprises in forest regions in Nepal
- Sale of locally produced herbal products in Nepal

However these tend to be isolated cases and struggle against business incentives that promote deforestation such as the high price of oil palm, the profitability of non-indigenous timber plantations and limited business infrastructure. While efforts to address environmental issues through social enterprise are developing rapidly in the region, specific links to deforestation are less common.

40,000

MICRO-ENTERPRISES

Nepal has over 40,000 micro-enterprises, two-thirds of which are linked to timber, non-timber forest products (NTFPs), ecosystem services and ecotourism. Many of these are run by women.

2. While challenges remain, there is a strong foundation of forest related enterprises in all three countries and opportunities exist for building and/or scaling to deforestation-free. Incentives are needed to accelerate them.

Nepal for instance has over 40,000 micro-enterprises, two-thirds of which are linked to timber, non-timber forest products (NTFPs), ecosystem services and ecotourism. Many of these are run by women. But these are frequently donor-driven, rarely gain any scale, and social enterprise is just starting to gain momentum.

Vietnam has a strong forestry and agriculture sector but it also has continuing high rates of negative impacts on the few remaining natural forests. Limited value adding of products is undertaken. Investment is emerging from the private sector (increasingly conservation led), donors, and state-owned banks. However there is poor market readiness, a focus on small projects and restrictive policies on foreign investment.

In Indonesia, innovators face similar barriers, such as a lack of alternative business models and connections to markets, few scalable projects and limited access to start-up capital. Investors exist, including some impact funds, and many donors are active. Local banks are conservative and generally reluctant to fund micro-enterprises. Investments are actually declining, though new regulations may change this.

While there are challenges (limited deal flow, regulations and enforcement), opportunities do exist and can be identified and developed by stakeholders that are operational on the ground and understand the local context. The seeming increase in interest from impact oriented investors and donors / philanthropists to support such initiatives is a positive signal and may facilitate development of these businesses by providing concessional capital to get them started and achieve investment readiness.

3. A number of pathways for business scaling and aggregation were identified from the cases. Some of these are restricted to specific sectors but all deserve more concentrated attention. Sectors with greatest potential include rubber, cocoa, rattan, essential oils, medicinal plants and low carbon technologies.

The success of the model proposed by the IIF project depends on the ability to identify and scale new or hitherto small ventures into operations that make a landscape-scale impact. Scaling up routes could be, for instance:

- Across **geographies**, bringing many different small-scale operations into a single sustainability-oriented supply chain as is being discussed for rubber in Sumatra;
- Along **trade chains**, for instance with cocoa, building added financial value for products from plantations that do not contribute to deforestation;
- Through **cross-industry coordination**, as with certified timber and wood products;
- By adding a **technological component** to boost efficiency, such as introducing electronic surveillance methods to prevent illegal logging and land use monitoring;
- By **innovation**, developing new supply chains etc., such as building demand for high quality chocolate products, or new pharmaceutical and cosmetic products from certified essential oils;
- Through creating **new markets**, e.g. for certified produce (protecting high carbon stocks, supporting biodiversity corridors, ensuring zero deforestation in the production);
- By providing **access to new markets**, both in the context of products (e.g. supporting links to new buyers) and financiers (e.g. connecting with impact investors).

4. Equally valuable is the provision of support services for business model development, connections with investors, and innovation exercises that link large markets and companies with smaller operators who can generate scalable solutions to the challenge of deforestation.

There is local interest and potential for developing innovative solutions tackling deforestation and some successful models do exist. However solutions fail to reach scale due to lack of support for business innovation, and investment readiness. Equally, demand-side interest in financing such solutions fails to translate into investment because of insufficient “quality” deal flow and poor product structuring.

An end-to-end, comprehensive approach will overcome obstacles that more narrowly focused initiatives face by covering the entire innovation funnel, identifying effective models, and advancing impact metrics to measure progress and facilitate adaptive management.

5. These services are provided by a limited number of incubators, connectors, innovation agents and business development services. Very few of these exist in Asia and most are found in urban areas. Efforts to build deforestation-free supply chains and green businesses must focus on extending and equipping this ecosystem of services and connecting the range of non-monetary services.

Four types of services are identified and explored:

- **Innovators:** entrepreneurs who develop a deeper understanding of social and environmental issues, and design, develop and scale solutions to tackle these challenges and their root causes with innovative approaches. Innovators can come from any sector, industry, educational background and social context.
- **Incubators:** companies that help new and start-up companies to develop by providing services such as management training or office space.
- **Connectors:** organizations or skilled individuals, often seconded from business, working with start-up companies to help them build partnerships to maximize their effectiveness.

- **Investors:** In the context of this report, investors include any organization that provides capital to a business working towards generating financial, environmental and social returns, with the expectation of both future financial and measurable non-financial returns (impact) to the investor.

While each of these is individually important, our hypothesis is that the combination of the four in a coordinated ecosystem of support is most likely to produce long-term results. However this depends on a comprehensive and sustained programme that builds a linked ecosystem of services. Sustainability can be attainable through a strong community platform (with a sustainable business model), programming that recovers costs, investment vehicles that generate return on investment and enduring changes to the policy framework.

An end-to-end, comprehensive approach will overcome obstacles that more narrowly focused initiatives face by covering the entire innovation funnel, identifying effective models, and advancing impact metrics to measure progress and facilitate adaptive management.

6. Public sector investments for business development, emissions reductions, restoration and sustainable development have a role to play in this process by financing new products and services, entrepreneurial support systems and innovation processes. However this will require a more positive and proactive attitude and policies towards private sector engagement.

Public financing for climate and land use has risen to US\$20-30 billion (through mechanisms such as the World Bank Carbon Fund, Green Climate Fund) and over US\$100 billion is expected to flow annually by 2020. For the first time, there is a real opportunity for landscape approaches to conservation being put into practice at scale, with public funds available to help them get established. The three focal landscapes in this report are the subject of the first landscape scale forest and climate (REDD+) programmes in Asia covering over 20 million hectares of land and aiming to reduce emissions by over 60 million tonnes CO₂e. Over US\$260 million has been allocated to these efforts.

However, public sector financing tends to benefit public sector solutions and there is a limited focus on private sector needs or approaches. While this is changing, only a few of the world's largest companies are likely to be able to access these funds in the short term and there is currently effectively no attention to SMEs and entrepreneurs. A change in the structuring of public investment policies is needed to address this gap and stimulate entrepreneurial solutions. This in turn requires a change in mindset from public and multilateral institutions.

There is a deep cultural and understanding divide between the public and private sector. These are two worlds that operate very differently, with deeply different languages and processes. This report aims at core to begin to build bridges across this gap and to foster the process of translating between these "tribes". Much more fundamental cross-learning is needed.

7. Private sector investment is already available for "green" business. However it struggles to find investable opportunities at a scale equivalent to fiscal supply and is hampered by a diversity of understandings of what is "green". Clearer standards, monitoring systems and aggregation services are required.

The private sector is also moving rapidly to take up the challenge of climate and land use change with initiatives in the labelled green and climate bond market (valued globally at US\$597.7 billion in July 2015); internal carbon pricing; investor concern with carbon-intensive stranded assets; and insurance companies scaling up to respond to anticipated climate impacts. But financiers still struggle because of the opportunity costs of these deals and the risk-return profiles, so blended

capital is needed to make them investable. In the report we present a number of small-scale businesses that have benefitted from public finance that allows them eventually to operate as independent businesses.

Across all countries it is easier to find funds than it is to find robust projects in which to invest them. Although the focus is on business, collaboration with the government is essential, including at local level to ensure development of project ideas.

8. The creation of forest friendly business at large or small scale is an undertaking that has barely begun. An initiative is now needed to build an evidence base for effective solutions and processes and to foster an ecosystem approach to linking services, policies and incentives.

Positive progress depends on:

- **Identifying** potentially suitable business models and innovators
- **Accelerating** innovative solutions to achieve significant scale
- **Facilitating** an integrated and beneficial combination of public and private financing
- **Measuring impact** and ensuring that businesses deliver promised environmental and social benefits
- **Promoting success stories** to users, entrepreneurs, innovators, businesses and donors
- **Connecting** top-down actors (institutions, policy makers, funds, etc.) and bottom-up innovators
- **Providing** input to policy making that encourages green business models
- **Ensuring buy-in** for green approaches from businesses engaged in the landscape
- **Replicating** successful models in other places impacted by deforestation

Achieving zero net deforestation will not be easy. A surprising number of the projects considered, whilst often providing excellent social and/or environmental impacts nonetheless had little direct impact on deforestation. And the number of businesses with potential environmental returns is a small fraction of the overall marketplace. Developing deforestation-free social enterprises remains in its infancy. But there is also a rapid and very encouraging growth of interest in the possibilities of business models that reduce deforestation, a new generation of entrepreneurs ready to take risks and build successful business models, and a global policy framework that supports such efforts. Events are likely to move quickly in the next few years. There is a huge amount yet to learn and much focused work ahead to build an effective system for achieving Impact In the Forests.

There is a deep cultural and understanding divide between the public and private sector. These are two worlds that operate very differently, with deeply different languages and processes. This report aims at core to begin to build bridges across this gap and to foster the process of translating between these “tribes”.



Focus landscapes including intact forest landscapes (large remaining blocks of undisturbed contiguous forests).

Key

- intact forest landscapes
- focal landscapes
- country boundary



Indonesia East Kalimantan Province



Nepal Terai arc landscape



Vietnam Annamite range landscape



Woman carrying fuelwood Kerinci area Sumatra, Indonesia.

References

- ¹ “By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally” <https://sustainabledevelopment.un.org/?menu=1300> accessed 5th December 2015.
- ² http://wwf.panda.org/about_our_earth/deforestation/forests_for_life/
- ³ Global Commission on the Economy and Climate. 2014. *Better Growth, Better Climate*. World Resources Institute and partners, Washington DC.
- ⁴ Taylor, R. (ed.) 2015. *The Living Forest Report: Chapter 5 – Saving forests at risk*. WWF International, Gland, Switzerland.
- ⁵ Taylor, R. (ed.). 2011. *WWF Living Forests Report, Chapter 1: Forests for a Living Planet*. WWF International, Gland, Switzerland. Available at: wwf.panda.org/livingforests
- ⁶ Morgan, J., Levin, K., and Jiawei Song, with J.P. Osornio. *Driving Transformative Change: The Role of the Private Sector in Advancing Short-Term and Long-Term Signals in the Paris Climate Agreement*. Working Paper. Washington DC: World Resources Institute. Available online at: <http://www.wri.org/driving-transformative-change>
- ⁷ UNEP. 2014. *Demystifying Private Climate Finance*. UNEP Finance Initiative, Nairobi.
- ⁸ Nakhooda, S., Watson, C. and Schalatek, L. 2015. *The Global Climate Finance Architecture. Climate Finance Fundamentals 2*. Overseas Development Institute and Heinrich Böll Stiftung, London and Washington DC.
- ⁹ Climate Change Support Team of the UN Secretary General. 2015. *Trends in Private Sector Climate Finance*, UN, New York.
- ¹⁰ Olsen-Rong, T., House, K., Sonerud, B. and Kidney, S. 2015. *Bonds and Climate Change: The state of the market 2015*. Climate Bonds Initiative for HSBC.
- ¹¹ Barnard, S., Nakhooda, S. Caravani, A. and Schalatek, L. 2015. *Climate Finance Regional Briefing: Asia*. Climate Finance Fundamentals 8, Overseas Development Institute and Heinrich Böll Stiftung, London and Washington DC.
- ¹² <http://www.katinganproject.com/about-us>
- ¹³ CCB Standards and Verified Carbon Standard, project description, Third edition: http://www.v-c-s.org/sites/v-c-s.org/files/2015-08-27%20Final%20PDD_RMU_Public.pdf
- ¹⁴ Indriatmoko, Y, Atmadja, S.S., Utomo, N.A., Ekaputri, A.D. and Komalasari, M. Katingan Peatland Restoration and Conservation Project, Central Kalimantan, Indonesia, Chapter 18 in E.O. Sills, S.S. Atmadja, C. de Sassi, A.E. Duchelle, D.L. Kweka, I.A.P. Resosudarmo, and W.D. Sunderlin (eds.) 2014. *REDD+ on the ground: A case book of subnational initiatives across the globe*. Bogor, CIFOR, Bogor Indonesia.
- ¹⁵ <http://emilyreadettbayley.com/katingan-project/>
- ¹⁶ WWF. 2013. *Ecosystems in the Greater Mekong: Past trends, current status, possible futures*. WWF Greater Mekong Programme, Hanoi.
- ¹⁷ Stellman, J.M., Stellman, S.D., Christian, R., Weber, T. and Tomasallo, C. 2003. The extent and patterns of usage of Agent Orange and other herbicides in Vietnam. *Nature* 422: 681-687.
- ¹⁸ WWF. 2013. *Ecosystems in the Greater Mekong: Past trends, current status, possible futures*. WWF Greater Mekong Programme, Hanoi.
- ¹⁹ FAO. 2007. *The World's Mangroves 1980-2005 (FAO Forestry Paper 153, Chapter 5*. Food and Agriculture Organization of the UN, Rome.
- ²⁰ FAO. 2015. *Global Forest Resources Assessment 2015: How are the world's forests changing?* FAO, Rome.
- ²¹ Meyfroidt, P. and Lambin, E.F. 2009. Forest Transition in Vietnam and displacement of deforestation abroad, *Proceedings of the National Academy of Sciences* 106: 16129-16144.
- ²² Dorais, A. and Cardille, J. 2011. Strategies for Incorporating High-Resolution Google Earth Databases to Guide and Validate Classifications: Understanding Deforestation in Borneo. *Remote Sensing* 3: 1157-1176.
- ²³ Rainforest Alliance. 2015. *An Evaluation of Asia Pulp & Paper's Progress to Meet its Forest Conservation Policy (2013) and Additional Public Statements*. Available from: www.rainforestalliance.org/sites/default/files/uploads/4/150205-Rainforest-Alliance-APP-Evaluation-Report-en.pdf
- ²⁴ Wulffraat, S. 2014. *The Environmental Status of the Heart of Borneo*. WWF Heart of Borneo Initiative.
- ²⁵ Langner, A., Miettinen, J. and Siegert, F. 2007. Land cover change 2002–2005 in Borneo and the role of fire. derived from MODIS imagery. *Global Change Biology* 13: 2329–2340
- ²⁶ Dennis, R.A. and Colfer, C.P. 2006. Impacts of land use and fire on the loss and degradation of lowland forest in 1983-2000 in East Kutai District, East Kalimantan, Indonesia. *Singapore Journal of Tropical Geography* 27: 30-48.
- ²⁷ BPS Indonesia.
- ²⁸ Fuller, D.O., Hardiono, M. and Meijaard, E. 2011. Deforestation projections for carbon-rich peat swamp forests of Central Kalimantan, Indonesia. *Environmental Management* 48: 436–447.
- ²⁹ Taylor, R. (ed.) 2015. *The Living Forest Report: Chapter 5 – Saving forests at risk*. WWF International, Gland, Switzerland.
- ³⁰ Figures from WWF Indonesia.
- ³¹ Taylor, R. (ed.) 2015. *The Living Forest Report: Chapter 5 – Saving forests at risk*. WWF International, Gland, Switzerland.
- ³² FAO. 2015. *Global Forest Resource Assessment 2015: Desk reference*. FAO, Rome.
- ³³ Gautam, A.P., Webb, E.L. and Eiumnoh, A. 2002. GIS Assessment of Land Use/Land Cover Changes Associated With Community Forestry Implementation in the Middle Hills of Nepal. *Mountain Research and Development* 22 (1):63-69.
- ³⁴ Pham, T.T., Bennet, K., Vu, T.P., Brunner, J., Le, N.D. and Nguyen, D.T. 2013. *Payments for forest environmental services in Vietnam: From policy to practice*. Occasional Paper 93. CIFOR, Bogor, Indonesia.
- ³⁵ Harada, K. and Wiyono. 2013. Certification of a Community-based Forest Enterprise for Improving Institutional Management and Household Income: A Case from Southeast Sulawesi, Indonesia. *Small-scale Forestry* 13 (1): 47-64.
- ³⁶ CIFOR REDD Case Book. 2014. <http://www.cifor.org/redd-case-book/case-reports/indonesia/katingan-peatland-restoration-conservation-project-central-kalimantan-indonesia/>
- ³⁷ UNFCCC INDCs for Indonesia, Vietnam and Nepal accessed on 29 January 2016 at <http://www4.unfccc.int/submissions/INDC/Submission%20Pages/submissions.aspx>.
- ³⁸ Government of Vietnam. 2014. Emission Reduction Program Idea Note FCPF Carbon Fund sourced on 29 January 2016 here
- ³⁹ Republic of Indonesia. 2015. *Emission Reductions Program Idea Note (ERPIN) Forest Carbon Partnership Facility (FCPF) Carbon Fund Draft #2* 17 December 2015.
- ⁴⁰ Government of Nepal. 2014. *Emission Reduction Program Idea Note FCPF Carbon Fund* sourced on 29 January 2016 here
- ⁴¹ Andersen, K.F. and Long, B. Undated. *An assessment of, and lessons learned from, two pilot community based natural resource management mechanisms in the Truong Son Mountains, Vietnam*. WWF Greater Mekong Programme, Quang Nam Forest Protection Department, Pu Huong Nature Reserve and DANIDA, Tam Ky.

- ⁴² ICEM. 2014. *USAID Mekong ARCC Climate Change Impact and Adaptation Study on Protected Areas: Non-timber forest products and crop wild relatives*. Prepared for the United States Agency for International Development by ICEM – International Centre for Environmental Management.
- ⁴³ Valkenburg, J.L.C.H. van. 1997. *Non-timber forest products of East Kalimantan: potentials for sustainable forest use*. Tropenbos, Wageningen, Netherlands.
- ⁴⁴ Ebrahim, N., Pravat, P.S., Humphreys, D. and Rayner, J. 2013. *Bridging certification and community forestry through NTFPs: A case study from Nepal. Issues and options brief*. IUFRO Task Force on Forest Governance.
- ⁴⁵ Forest Science Institute of Vietnam. 2009. *Vietnam Forest Outlook Study*. Working Paper number APFSOS II/WP/2009/09, FAO Regional Office for Asia and the Pacific, Bangkok.
- ⁴⁶ Ministry of Trade of the Republic of Indonesia. 2011. *Indonesian Essential Oils: The scent of life*. Jakarta.
- ⁴⁷ Nguyen, Q., Hoang, M.H., Öborn, I. and van Noordwijk, M. 2013. Multipurpose Agroforestry as a climate change resiliency option for farmers: an example of local adaptation in Vietnam. *Climatic Change* 117: 241-257.
- ⁴⁸ <http://blogs.worldwatch.org/nourishingtheplanet/innovation-of-the-week-agroforestry-project-restores-wildlife-habitat-and-generates-income-in-borneo-agroforestry-deforestation-biofuels-indonesia/>
- ⁴⁹ Pandit, B.H., Neupane, R.P., Sitaula, B.K. and Bajracharya, R.M. 2012. Contribution of small-scale Agroforestry systems to carbon pools and fluxes: *A case study from Middle Hills of Nepal*. *Small-scale Forestry* DOI 10.1007/s11842-012-9224-0
- ⁵⁰ Khanal, B.R. and Babar, J.T. 2007. Community Based Ecotourism for Sustainable Tourism Development in the Mekong Region. Policy Brief. CUTS International, Hanoi.
- ⁵¹ http://www.wwf.or.id/en/about_wwf/whatwedo/pds/social_development/communitybasedecotourism/borneoecotourism/
- ⁵² Pandit, R., Dhakal, M. and Polyakov, M. 2015. Valuing access to protected areas in Nepal: The case of Chitwan National Park. *Tourism Management* 50: 1-12.
- ⁵³ Cole, S., Aponte, A.T., Hasselström, L., Stavlöt, U. and Stenson, D.E. 2014. *Developing Payment for Ecosystem Services: A synthesis of the approach and lessons learned from a pilot project to protect mangrove forests in Vietnam*. *FORES Study* 2014: 3, Stockholm.
- ⁵⁴ Fripp, E. and Shantiko, B. 2014. Payment for Ecosystem Services (PES): Assessment of PES potential in Kapuas Hulu, Working Paper 165, Center for International Forestry Research, Bogor, Indonesia.
- ⁵⁵ IUCN Nepal. 2013. *Payment for Ecosystem Services in Nepal: Prospect, Practice and Process*. IUCN Nepal, Kuponhole, Lalitpur, Nepal.
- ⁵⁶ Blum, N.U., Wakeling, R.S., and Schmidt, T.S. 2013. Rural electrification through village grids—Assessing the cost competitiveness of isolated renewable energy technologies in Indonesia. *Renewable and Sustainable Energy Reviews* 22: 482-496.
- ⁵⁷ <http://www.thejakartapost.com/news/2014/03/03/biogas-power-plants-built-rural-areas.html>
- ⁵⁸ Surendra K.C., Khanal, S.K., Shrestha, P. and Lamsal, B. 2011. Current status of renewable energy in Nepal: Opportunities and challenges. *Renewable and Sustainable Energy Reviews* 15: 4107-4117.
- ⁵⁹ <https://www.youtube.com/watch?v=IKQ2fkYhqqo>
- ⁶⁰ http://lens.blogs.nytimes.com/2013/07/08/hard-labor-in-nepals-brick-factories/?_r=0
- ⁶¹ Kusters, K., Achdiawan, R., Belcher, B. and Ruiz Pérez, M. 2006. Balancing development and conservation? An assessment of livelihood and environmental outcomes of nontimber forest product trade in Asia, Africa, and Latin America. *Ecology and Society* 11 (2): 20. URL: <http://www.ecologyandsociety.org/vol11/iss2/art20/>
- ⁶² <http://wwf.panda.org/?202615/Rattan-FSC-certification--From-Laos-to-Vietnam>.
- ⁶³ Singh, A.G., Kumar, A. and Tewari, D.D. 2012. An ethnobotanical survey of medicinal plants used in Terai forest of western Nepal. *Journal of Ethnobiology and Ethnomedicine* 8: 19.
- ⁶⁴ <http://www.environmentalleader.com/2013/09/04/rubber-industry-to-create-sustainability-standards/>
- ⁶⁵ Hirschberger, P. 2011. *Global Rattan Trade: Pressure on forest resources, analysis and challenges*. WWF Austria, Vienna.
- ⁶⁶ WWF. 2011. Rattan certification of Laos rattan forests will be a world first. Leaflet.
- ⁶⁷ WWF and IKEA. 2011. Supply chain certification for rattan in Laos: Soon a reality but at what cost? Leaflet.
- ⁶⁸ http://wwf.panda.org/what_we_do/where_we_work/greatermekong/our_solutions/species/tigers_in_the_greater_mekong_region/?226332/Sustainable-rattan-management-in-Laos-goes-from-strength-to-strength-with-new-FSC-certifications-and-export-order
- ⁶⁹ Campbell, R. and Knowles, T. 2011. *Project Evaluation of WWF Sustainable rattan project in Loa DRR*, Report to the WWF Greater Mekong Programme.
- ⁷⁰ Chey, K., Prak, O., Viet, T.L. and Ledecq, T. 2015. Sustainable cottage industries and the Rattan Association of Cambodia. *ETFRN News* number 57, pp 118-125.
- ⁷¹ GIIN and Dahlberg report, April 2015.
- ⁷² Climate Technology Program. Undated. Vietnam Climate Innovation Center (CIC): Summary note.
- ⁷³ Roberts, M. Undated. *Hydrologic – Infiltrating the market: Evolution of a social enterprise*. Hydrologic, Phnom Pen.
- ⁷⁴ Roberts, M. Undated. Op cit.
- ⁷⁵ Nexus. Undated. Making clean air and water a reality in Cambodia. Leaflet.
- ⁷⁶ Harrison, D.R. and Swinfield, T. 2015. Restoration of logged humid tropical forests: An experimental programme at Harapan Rainforest, Indonesia. *Tropical Conservation Science* 8 (1): 4-16. Available online: www.tropicalconservationscience.org
- ⁷⁷ Information from BirdLife Indonesia and partners.
- ⁷⁸ Nexus. Undated. Biogas: transforming waste into opportunity in Vietnam. Leaflet.
- ⁷⁹ Nexus. Undated. Biogas: transforming waste into opportunity in Vietnam. Leaflet.
- ⁸⁰ Vu Dinh Ton, Nguyen Van Duy, Ngo Thanh Son, Phan Dang Thang, Nguyen Thu Phuong, Ha Xuan Bo, Nguyen Cong Oanh and Bruno Verbist. 2013. *Biogas Survey on the BPII Program 2013*. ACE Europe, Mechelen, Belgium.
- ⁸¹ Biogas E-Newsletter. 2014. <http://www.biogas.org.vn/english/getattachment/d2199b45-3b61-4487-bad9-862dbef84665/April-2014-Enewsletter.pdf.aspx>
- ⁸² Sayer, J., Campbell, B., Petheram, L., Aldrich, M., Ruiz Perez, M., Endamana, D., Dongmo, Z.L.N., Defo, L., Mariki, S., Daggart, N. and Burgess, N. 2007. Assessing environment and development outcomes in conservation landscapes. *Biodiversity Conservation*: DOI 10.1007/s10531-006-9079-9.

- ⁸³ Sheil, D., Puri, R.K., Basuki, I., van Heist, M., Wan, M., Liswanti, N., Rukmiyati, Sardjono, M.A., Samsuudin, I., Sidiyasa, K., Chrisandini, Permana, E., Angi, E.M., Gatzweiler, F., Johnson, B. and Wijaya, A. 2002. *Exploring biological diversity, environment and local people's perspectives in forest landscapes: Methods for a multidisciplinary landscape assessment*. CIFOR, Bogor Indonesia.
- ⁸⁴ Clifford, J., Markey, K., and N. Malpani. 2013. *Measuring Social Impact in Social Enterprise: The state of thought and practice in the UK*. London. E3M.
- ⁸⁵ Kusters, K., Achdiawan, R., Belcher, B. and Ruiz Pérez, M. 2006. *Balancing development and conservation? An assessment of livelihood and environmental outcomes of non-timber forest product trade in Asia, Africa, and Latin America*. *Ecology and Society* 11(2): 20. [online] URL: <http://www.ecologyandsociety.org/vol11/iss2/art20/>
- ⁸⁶ Belcher, B. and Schrenkenberg, K. 2006. *Commercialisation of non-timber forest products: a reality check*. *Development Policy Review* 25 (3).
- ⁸⁷ Belcher, B., Ruiz-Pérez, M. and Achdiawan, R. 2005. *Global patterns and trends in the use and management of commercial NTFPs: implications for livelihoods and conservation*. *World Development* 33 (9): 1435-1452.
- ⁸⁸ Wollenberg, E. and Ingles, A. (eds.) 1998. *Incomes from the Forest: methods for the development and conservation of forest products for local communities*. CIFOR and IUCN, Bogor and Gland, Switzerland.
- ⁸⁹ Secretariat of the Convention on Biological Diversity. 2001. *Sustainable management of non-timber forest resources*. Montreal, SCBD, 30p. (CBD Technical Series no. 6).
- ⁹⁰ Nepal, M., Nepal, A. and Grimsrud, K. 2011. Unbelievable but improved cookstoves are not helpful in reducing firewood demand in Nepal. *Environment and Development Economics* 16 (1): 1-23.
- ⁹¹ Alongi, D.M. 2002. Present state and future of the world's mangrove forests. *Environmental Conservation* 29 (3): 331-349.
- ⁹² Crona, B.I. and Rönnbäck, P. 2005. Use of replanted mangroves as nursery grounds by shrimp communities in Gazi Bay, Kenya. *Estuarine, Coastal and Shelf Science* 65 (2): 535-544.
- ⁹³ Siebert, S.F. 2004. Demographic Effects of Collecting Rattan Cane and Their Implications for Sustainable Harvesting. *Conservation Biology* 18 (2): 424-431.
- ⁹⁴ Denier, L., Scherr, S., Shames, S., Chatterton, P., Hovani, L., Stam, N. 2015. *The Little Sustainable Landscapes Book*, Global Canopy Programme: Oxford.

This report has been made possible thanks to:

Funders:

Climate-KIC
WWF Switzerland

Recommended citation:

N. Dudley, P. Chatterton, E. Cramer, A. Cremonesi, R. Deau, T. Havemann, H. Hoffmann-Riem, T. Neupane, A. Safford, P. Scheuch, D. Shandilya, P. Skvaril, S. Stolton, S. Varma. 2016. *Impact in the Forest: The Potential for Business Solutions to Combat Deforestation in Large Forest Landscapes in Asia*, WWF-Switzerland: Zürich.

Notice for text and graphics:

© 2016. Clarmondial, Ennovent, Greenworks Asia, Impact Hub, WWF.
All rights reserved.

ISBN: 978-2-940529-36-0

Contributors:

Clarmondial: Tanja Havemann

Ennovent: Peter Scheuch, Tapas Neupane, Deepak Shandilya, Sandeep Varma

GreenWorks Asia: Agnes Safford

Impact Hub: Petr Skvaril, Elisabeth Cramer, Raphaele Deau, Alberto Cremonesi

WWF: Holger Hoffmann-Riem, Paul Chatterton

WWF Landscape Finance Lab: Publication 1

Reviewers:

Chris Elliott, CLUA
Chris Knight, PwC
Richard McNally, SNV
Ben Ridley, Credit Suisse
Rod Taylor, WWF
Dang Thuy Trang, ADB
Kate Wolfenden, WWF

Report development:

Writers: Nigel Dudley and Sue Stolton, Equilibrium

Design: millerdesign.co.uk

Copywriter: Caroline Snow