



PROSPECTIVE DEVELOPMENT PATHWAYS:

Private sector engagement in landscape approaches to reduce emissions from land use activities in Jambi province

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In Partnership with



Creating Markets, Creating Opportunities

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International Finance Corporation
Indonesia Stock Exchange Building
Tower 2, 9th floor
Jl. Jenderal Sudirman Kav. 52-53
Jakarta 12190, Indonesia

Produced by IFC:

Kathleen Bottriell, Sophia Gnych, Helen Lumban Gaol

Under the supervision of:

Dan Radack (BioCarbon Fund/World Bank), Ernest E. Bethe III (IFC), Triyanto Fitriyardi (IFC), Michael Brady (IFC), Bruce Wise (IFC), Alexander Lotsch (World Bank), Dinesh Aryal (World Bank), Christopher Brett (World Bank) Jan Joost Nijhoff (World Bank), and Katie O’Gara (BioCarbon Fund/World Bank).

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GLOSSARY

APP	Asia Pulp & Paper, a trade name of a number of pulp and paper manufacturing companies within the Sinar Mas Group
APRIL	Asia Pacific Resources International Ltd
BACP	Biodiversity and Agriculture Commodities Program
BAPPENDA	Badan Pengelolaan Pendapatan Daerah/Regional Revenue Management Agency
BioCF	BioCarbon Fund
BMP	Better Management Practices
BPDP-KS	Badan Pengelola Dana Perkebunan Kelapa Sawit/Agency for Funding of Oil Palm Plantations, also known as the CPO fund.
BPS	Badan Pusat Statistik
BRG	Badan Restorasi Gambut
CDM	Clean Development Mechanism
CPO	Crude Palm Oil
CSA	Climate Smart Agriculture
DFI	Development Finance Institution
ERC	Ecosystem Restoration Concession
FFB	Fresh Fruit Bunch
FoKSBI	Forum Kelapa Sawit Berkelanjutan Indonesia
FSC	Forest Stewardship Council
GAPKINDO	Gabungan Perusahaan Karet Indonesia/Indonesia Rubber Association
GAR	Golden Agri Resources
GFW	Global Forest Watch
GHG	Greenhouse Gas
GIS	Geospatial Information System
Gt	Gigaton, equivalent to one billion metric tonnes
HA	Natural Forest Concession
HCV	High Conservation Value
HGU	Hak Guna Usaha/Right of Plantation
HKm	Hutan Kemasyarakatan/Community-Based Forest License
HPH	Hak Pengusahaan Hutan/Commercial Forest Concession
HTI	Hutan Tanaman Industri/Industrial Timber Plantation

HTR	Hutan Tanaman Rakyat/Community Plantation Forest
ICRAF	International Council for Research in Agroforestry (also known as World Agroforestry)
IDH	The Sustainable Trade Initiative
IOPRI	Indonesian Oil Palm Research Institute/PPKS - Pusat Penelitian Kelapa Sawit
ISCC	International Sustainability & Carbon Certification
ISFL	Initiative for Sustainable Forest Landscapes
IUPHHK-HA	Izin Usaha Pemanfaatan Hasil Hutan Kayu - Hutan Alam/Business License for the Utilization of Timber in Natural Forest
IUPHHK-HTI	Izin Usaha Pemanfaatan Hasil Hutan Kayu - Hutan Tanaman Industri/Business License for the Utilization of Timber from Plantation Forest
IUPHHK-RE	Izin Usaha Pemanfaatan Hasil Hutan Kayu - Restorasi Ekosistem/Business License for the Utilization of Forest Products for Ecosystem Restoration in Natural Forests
KEE	Kawasan Ekosistem Esensialor/Essential Ecosystem Areas
KKI WARSI	Komunitas Konservasi Indonesia Yayasan Warung Informasi Konservasi
KLHK	Kementerian Lingkungan Hidup dan Kehutanan/Ministry of Environment and Forestry
KUD	Koperasi Unit Desa/Co-operative
LEI	Lembaga Ekolabel Indonesia/the Indonesian Ecolabelling Institute
MFD	Maximizing Finance for Development
NDC	Nationally Defined Contribution
NDPE	No Deforestation, No Peat, No Exploitation
PEFC	Programme for the Endorsement of Forest Certification
POME	Palm Oil Mill Effluent
PTPN	PT Perkebunan Nusantara, a state-owned enterprise
RGE	Royal Golden Eagle Group
RSPO	Roundtable on Sustainable Palm Oil
RSS	Responsible Sourcing from Smallholders
SCCM	Sustainable Commodities Compensation Mechanism
SFM	Sustainable Forest Management
SHARP	Smallholder Acceleration through Responsible Production and Sourcing
SNV	Stichting Nederlandse Vrijwilligers/Foundation of Netherlands Volunteers
TLFF	Tropical Landscapes Financing Facility
WRI	World Resources Institute
WWF	World Wildlife Fund



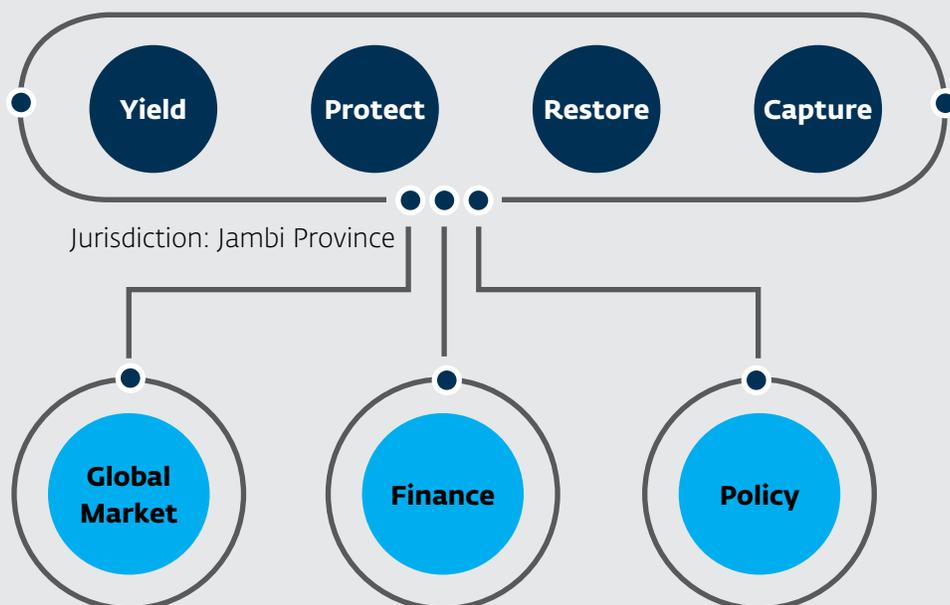
Jambi, Indonesia

SUMMARY

Reducing Greenhouse Gas Emissions in Jambi Province: Private Sector Entry Points

Activity	Key Jambi Private Sector
Farmer Training	Rubber, Oil Palm, Coconut, Cinnamon, Arabica coffee
Smallholder Replanting	Rubber, Oil Palm, Coconut
Conservation/Restoration	Rubber, Oil Palm, Pulpwood, ERCs
Fire Management	Oil Palm, Pulpwood
Sustainable Forest Management	Pulpwood, ERCs
Biogas Capture	Oil Palm, Rubber, Pulpwood
Low Emission Alternatives	Rubber, Cinnamon
Responsible & Jurisdictional Sourcing	Rubber, Oil Palm, Pulpwood

Figure 1: Proposed aspects of a private sector emission-reduction approach in Jambi



Report Use and Prospective Next Steps

The findings from this rapid diagnostic study are for use by the BioCarbon Fund (BioCF) and the Initiative for Sustainable Forest Landscapes (ISFL) teams to help to identify which private sector entry points and enabling activities to pursue further in the Jambi program, and by private sectors actors to move forward on suitable initiatives. These finding can further develop a project in Jambi province, with private sector investment clients. The following entry points have been identified as high potential with the associated actions listed:

1. Development of low emission alternative commodity supply chains

Next steps for this option:

- Undertake market studies and feasibility for low emission alternative commodities
- Identify potential investment clients at each step in the supply chain (production, processing, trading and manufacturing)
- Engage potential clients in discussion

2. Invest in smallholder replanting

Next steps for this option:

- Prepare a summary of barriers to smallholder investment / bankability in Jambi
- Collaborate with the BioCF and ISFL teams to identify what actions are needed to remove investment blockages (e.g. land title/regularization)
- Identify potential investment clients whose smallholder supply base would benefit (rubber, oil palm, coffee)
- Engage potential clients in discussion

3. Establish a Center of Excellence for Smallholder Training

Next steps for this option:

- Develop a business model that secures long-term financial sustainability
- Identify potential investment clients whose smallholder supply base would benefit (rubber, oil palm, coffee)
- Collaborate with the World Bank to build on government extension programs
- Engage potential clients in discussion

4. Establish Community Plantation Forestry

Next steps for this option:

- Undertake market feasibility studies for non-pulp timber species (e.g. rubber, pulai)
- Develop a business model (e.g. investment in downstream industry that would manage the scheme) or investment structure (e.g. bond) that would facilitate investment
- Identify potential investment clients and/or investors

In the next phase of the program, work by the team can include determining the emissions reductions potential of the proposed activities.

INTRODUCTION

The BioCarbon Fund (BioCF) Initiative for Sustainable Forest Landscapes (ISFL) was established to promote and reward reducing greenhouse gas (GHG) emissions from the land sector. This fund is supported by donor governments and managed by the World Bank. The ISFL provides technical assistance to support the design of programs that impact multiple sectors of the economy and results-based payments to incent and sustain program activities.

The ISFL Indonesia Program will pilot a jurisdictional landscape approach in Jambi Province.

The program will seek to improve landscape management and reduce emissions from the forest and land use sector¹, while promoting alternative livelihoods that help to take the pressure off of the province's primary forests and peatlands. Indonesia will prepare an emission reductions program for Jambi province which will enable the program to access results-based financing for emission reductions

This rapid diagnostic study focuses on the entry points for private sector to reduce land-based GHG emissions in Jambi province.

This study was undertaken in Autumn 2017 to provide input into the Jambi ISFL program design, cataloguing relevant context in Jambi's agriculture and forestry commodity sectors, and identifying the potential role for private sector to reduce land-based GHG emissions. In addition, activities have been identified that would further enable private sector implementation of these activities, an approach consistent with the Maximizing Finance for Development (MFD) framework¹, which seeks to leverage the private sector and optimize the use of scarce public resources.² Case studies illustrate the types of private sector emission-reduction activities which may be possible, however they are not endorsements of the companies involved or the activities described.

Identifying wider opportunities to reduce emissions (beyond private sector entry points) will be undertaken as part of the development of the ISFL Jambi program. Preparation activities will focus on effective implementation of existing policies to protect primary forests and reduce

'Private actors—from subsistence farmers to global, multinational firms—have significant influence on the way land is used. The ISFL is working closely with the private sector to provide livelihood opportunities for communities in each jurisdiction and mobilize finance for critical investments.'

- BioCarbon Fund on private sector engagement

¹Measured as either total GHG emissions reductions estimated in tons equivalent CO₂e/year, or total enhancement of carbon stocks, estimated in tons equivalent CO₂e/year

²The MFD framework uses a cascade decision framework to identify what actions can be undertaken by development institutions to enable sustainable private sector solutions—private finance (crowding-in) and/or private delivery—for development projects; and/or address binding constraints (e.g. physical, operational, regulatory or enabling environment) in a way that is expected to unlock private solutions where appropriate.

fires, identifying key drivers of emissions, notably in the agricultural sector; and capacity building and stakeholder engagement, especially at the provincial level. These preparation activities will include the development of a safeguards framework and safeguards instruments, design and consultations for benefit sharing arrangements, land and resource tenure assessment, and stakeholder consultations.

Jambi Landscapes

Jambi province has highland forest areas in the west, lowlands in the center, and in the east, peatlands and coastal mangrove forests. From an emissions perspective, the eastern peatlands are the most important. The western part of the province, with highland forests, also contains important carbon stocks in standing forests. The lowlands have largely been converted to oil palm and rubber plantations.

In Jambi, approximately 40 percent of the provincial land area is part of the government's forest estate, equivalent to 2,098,535 ha – roughly the size of El Salvador.² There are eighteen business licenses (690,280 ha) allocated for the utilization of timber from plantation forest (IUPHHK-HTI),³ three of which are for pulpwood (364,842 ha), two licenses (56,054 ha) for the utilization of timber in natural forest (IUPHHK-HA) and two licenses (87,850 ha) for the utilization of forest products for ecosystem restoration in natural forests (IUPHHK-RE). (Figure 2).

Oil palm and rubber plantations comprise 85 percent of the agriculture plantation area and approximately 27 percent of the total provincial land area (Figure 2). These two crops are planted extensively in every district of the province, except Kerinci in the western highlands. This includes both industrial plantations (186 oil palm and three rubber plantations are recorded) as well as plasmaⁱⁱⁱ and independent smallholders. Plantation crops (referred to as 'estate crops' in Indonesia) with some importance include tall coconut, cinnamon, *Robusta* coffee and betel nut which together account for 13 percent of the plantation area. The remaining plantation crops accounting for a mere two percent of the area, and include tea (consolidated in a single state-owned plantation), cocoa,

JAMBI PROVINCE

Key Statistics

Land area:

• 50,058.16 km² • 5 million ha

Population: 3,092,265

Districts:

• Jambi City • Sungai Penuh City • Batanghari • Bungo • Kerinci • Merangin • Muaro Jambi
• Sarolangun • Tebo • Tanjung Jabung Barat • Tanjung Jabung Timur

National Parks:

• Kerinci Seblat National Park • Berbak National Park, • Bukit Tiga Puluh National Park
• Bukit Dua Belas National Park

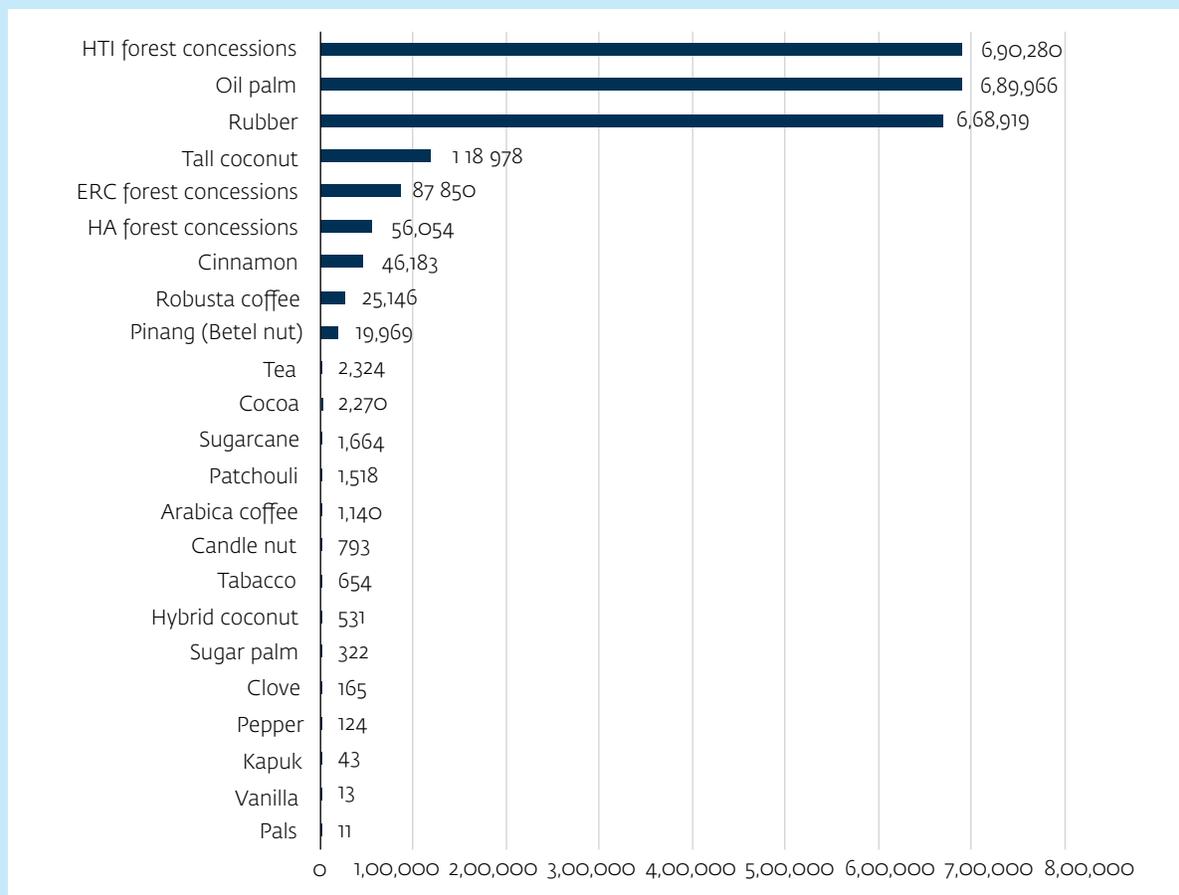
ⁱⁱⁱPlasma is the term used in Indonesia to describe smallholders that are associated or tied to mills for access to land and inputs, and that exclusively supply that mill.

clove, pepper, candle nut, sugar palm, sugarcane, vanilla, patchouli and nutmeg.⁵ Total plantation crops in Jambi cover 1.58 million ha, approximately 32 percent of the total provincial land area.

Focus commodities

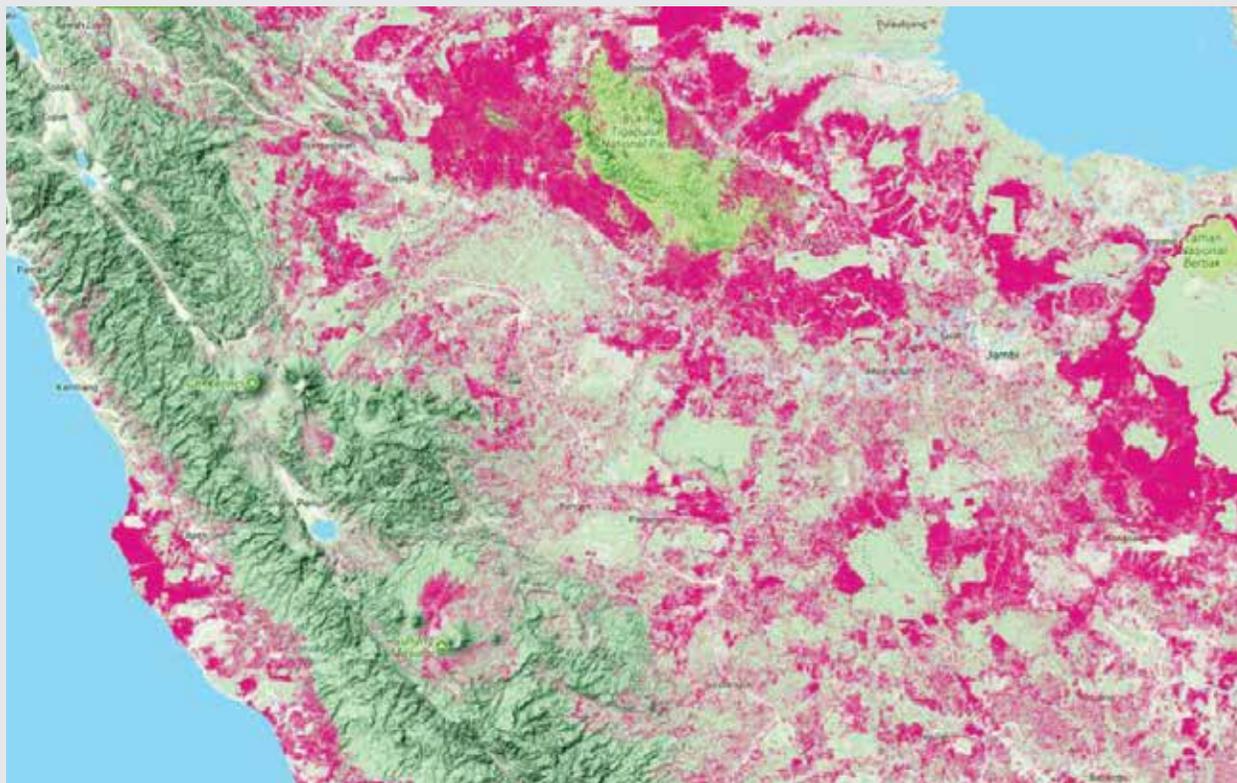
For the purposes of this study, rubber, oil palm, pulpwood, coffee, and cinnamon were selected as focus commodities. These commodities are linked to global supply chains and were selected considering the extent of their production in Jambi, the global market, export volumes from Jambi, their role in past land use change, their potential as a low emissions alternative crop, employment and incomes. Where available, information on private sector entry points in the coconut sector have also been included, though further work is needed to determine its potential role in reducing land-based GHG emissions.

Figure 2: Agriculture Plantation Area (ha) in Jambi Province, 2015 Provincial Statistics,^{iv} and HTI and HA forest concessions (ha), 2016.⁶ Note that there may be overlap between the forest estate (kawasan hutan) and non-forest estate (Areal Penggunaan Lain, or APL).



^{iv}The provincial data cited in the graph above differs from national statistics by Badan Pusat Statistik (BPS), which records rubber at 328,581 ha, oil palm at 1,013,811 ha, coconut at 108,471 ha, cinnamon at 56,276 ha, coffee at 13,447 ha, pinang at 13,482 ha and cocoa at 718 ha and sugarcane at 7,374 ha.

Figure 3: Map showing tree cover loss in red, 2010 – 2016 (user generated map from globalforestwatch.org)



Forest change

Pulpwood is widely considered to have been the key driver of forest change in Jambi province.

Harvesting of mixed tropical hardwood for pulp mainly occurred from the 1980s to 2000s, after which the natural forest concessions were re-allocated for timber plantation development. Jambi's pulp industry now relies on plantation-grown acacia and eucalyptus. Global demand for paper and tissue is growing, and the Indonesian pulp and paper industry continues to expand its processing capacity.

Many oil palm plantations were established on areas that had been previously harvested for pulpwood.

Oil palm has been widely planted in Jambi since the late 1990s, when re-zoning of depleted forest concessions to Hak Guna Usaha/Right of Plantation (HGU) occurred. There has also been encroachment into state forest land by oil palm small and medium-sized producers. Global demand for palm oil is increasing, however oversupply has meant a strong downward trend in price since 2011. Excess mill capacity exists due to ongoing investment in the sector.

Rubber has been widely planted in Jambi for over one hundred years but may be in decline. Smallholders are first recorded planting rubber in the early 1900s, and it was previously the main agriculture crop in the province. A spike in the global rubber price in 2010-2011 likely resulted in encroachment in the forest estate. There are contradictions in available statistics on whether the area under rubber in Jambi is decreasing, but anecdotal information indicates that farmers are replacing rubber trees with oil palm. Rubber factories are sourcing from other provinces amid steady

demand, though oversupply from other countries is likely put downward pressure on prices for the foreseeable future.

Both coffee and cinnamon are planted inside Kerinci Seblat National Park. The park was established in 1999, and therefore some cinnamon trees pre-date its establishment, while encroachment by coffee is more recent. There are also examples of extensive coffee smallholdings in expired timber concessions (which are part of the state-owned forest estate). Demand for coffee is continuing to grow domestically and internationally. In Jambi the area under cinnamon is declining, while global demand (and prices) are increasing.

CASE STUDY

Global Forest Watch

The map in Figure 2 was created using Global Forest Watch (GFW), an open-source, free web application to monitor global forests in near real-time. According to GFW data for Jambi:

> 1,360,000 ha trees lost between 2010 – 2016

> 464,000 ha tree cover gain between 2001-2012

Data sets, including forest change, forest cover, forest use, conservation and people, are tracked. Tree loss is calculated where there is >30 percent canopy density. Users may subscribe to daily, weekly or monthly forest change alerts, the smallest resolution available is 30 m. Fire alerts are also available daily.

This data should be treated as indicative, as there are challenges distinguishing certain types of land cover; the forest loss/gain data does not distinguish between natural and plantation forest; and frequent cloud cover in Sumatra may obscure satellite images.

FARMER TRAINING



- Improving farmer yields, to reduce expansion into remaining forest
- Optimizing farmer fertilizer use, to reduce emissions of nitrous oxide
- Soil conservation, to maintain or enhance soil carbon stock

CASE STUDY

Vietnam Low Carbon Rice Project

By reducing seed density, water, fertilizer and pesticide/herbicide, rice farmers in Vietnam are reducing emissions of methane and nitrous oxide, as well as lowering input costs.

The project also intends to supplement farmer incomes through the sale of carbon credits generated by the emissions reductions.

Preliminary results indicate that practices have led to approximately 40-65 percent reductions in GHG emissions.

Smallholder yield improvements are considered an important tool for reducing emissions from land use change.

If smallholders can produce more per hectare, the theory is that they will not encroach into the remaining forest. For example, if Indonesian oil palm smallholder producers could attain their maximum possible efficiency, their production could increase from 6.6 to 18.9 million mt (i.e. an increase in efficiency of 35 percent to 100 percent).⁷ However, increased yields and availability of disposable incomes may create a perverse incentive to expand, if adequate governance and conservation measures are not in place.

Nitrogen-rich crop fertilizers, including manure and synthetic fertilizers, are converted to nitrous oxide, a powerful GHG, by soil microbes.

Research suggests that excess use of fertilizer can exponentially increase these emissions.⁸ The government distributes subsidized fertilizer, which is available to farmers holding less than two ha and can be purchased at local kiosks. In theory, subsidized fertilizer could lead to excess use, however in practice it has been widely reported that many farmers end up paying higher prices than the highest retail prices,⁹ and that large plantation companies are purchasing the subsidized fertilizer.¹⁰

Organic carbon can be sequestered in soils, removing GHGs from the atmosphere, as well as increasing soil fertility.

Research indicates that the top meter of the world's soils contains three times as much carbon as the entire atmosphere, making it a major carbon sink alongside forests and oceans.¹¹ There remains scientific debate on whether soil erosion results in carbon emissions, or redistribution to other locations¹² – what is clear is that soil loss can have a negative impact on yields. Research is being undertaken on the extent to which crop diversification, crop residue management, soil tillage, integrated soil fertility management, agroforestry, and water management can sequester soil carbon.¹³

Training smallholder farmers to adopt Climate-Smart Agriculture (CSA) practices can be an important means to reduce emissions. This can include yield improvements, optimizing fertilizer use and practices that sequester soil carbon. There are close to 600,000 farmers¹⁴ in Jambi growing key plantation crops (around 20 percent of the population),^{vi} which means training all of them would be a challenging but important opportunity.

Local governments are legally obligated to organize agricultural extension at provincial and district levels. Prior to decentralization in 1999, the Ministry of Agriculture had a direct network with 32 Agricultural Training Centres and 343 Balai Penyuluhan Pertanian or Rural Extension Centres (REC) across Indonesia. In Jambi province, the Dinas Perkebunan (Provincial Estate Crop Service) reported that they currently have five extension officers allocated to plantation crops at the provincial level.

Private sector and non-governmental organizations are allowed to establish their own agricultural extension institutions.¹⁵ For example, in Jambi, SNV has launched a smallholder rubber programme working on a Better Management Practice (BMP) model and to date have piloted the SHARP^{vii} Responsible Sourcing from Smallholders (RSS) risk assessment to a group of 40 rubber farmers adjacent to the Berbak National Park, to assess training and support needs.¹⁶

Almost all of Jambi's rubber producers are independent smallholders, relying on the state for training and inputs. Provincial statistics record a total of 668,919 ha rubber, of which 98.9 percent is grown by independent smallholders. There are only two plasma schemes (6,862 ha), and three industrial plantations, equivalent to less than 5,000 ha.^{viii, 17} During field work, one crumb rubber processing company indicated that they are providing a limited amount of training, by bringing the head of one of the rubber cooperatives to teach other farmers groups good agriculture practices.

Oil palm plantation companies have an obligation to work with associated smallholders. This was initially prescribed as part of government Nucleus Estate and Smallholder projects (better

^vClimate Smart Agriculture aims to increase productivity, enhance resilience and reduce emissions.

^{vi}Rubber (256,256 farmers), coconut (94,748 tall coconut farmers and 2,330 hybrid coconut farmers) coffee (24,920 Robusta and 1,501 Arabica farmers), and oil palm (206,787 farmers, approximately 40 percent of oil palm production)

^{vii}SHARP is a multi-stakeholder partnership working with companies on smallholder engagement, developing and refining these practical open-source tools. It was developed in 2011, with Sime Darby, Proforest and The Forest Trust.

^{viii}PT Brahma Bina Bakti, (2,720 ha, now changed to an oil palm plantation), PT PP Bajabang Indonesia (1,689 ha) and PT Lubuk Lancang Kuning (302 ha)

CASE STUDY

Lingkar Temu Kabupaten Lestari

In South Sumatra, Musi Banyuasin district has committed to achieve jurisdictional certification by 2020. This 'Sustainable District' (Lingkar Temu Kabupaten Lestari In Bahasa Indonesia) is in the process of establishing a Centre of Excellence, a partnership between private sector companies and government, to train smallholders.

Musi Banyuasin is part of a 'Sustainable District' program, being supported by World Resources Institute (WRI), IDH-The Sustainable Trade Initiative and others.

Batanghari district in Jambi province has been identified as a candidate for LTKL.

known as NES or PIR Berbantuan) which began in the late 1970s, including trans-migration projects, where people were moved from densely populated areas to the outlying provinces and allocated land for oil palm, tied to industrial plantations ('plasma' schemes). More recently a '*plasma obligation*' was introduced in 2007, requiring companies to assign 20 percent of the total land allocated in the plantation business license to the local community.¹⁸

Arabica coffee farmers in the Kerinci highlands receive support from a coffee exporter, though the small number of farmers means limited impact. Approximately 1,500 smallholders grow arabica in Jambi, and they supply processor and exporter PT Agrotropic Nusantara. Part of the support involves mapping plots to ensure farmers are outside of the national park boundaries. The Robusta coffee beans from Jambi are being transported to other provinces through a series of traders, and none of the trading companies, exporters or downstream supply chain actors are known to be providing support to Jambi coffee smallholders.

Cinnamon farmers in the Kerinci highlands receive training on sustainable agriculture at the Cassia Co-op Training Center, though the small number of farmers means limited impact. The training is part funded by the Sustainable Spices Initiative, a sector-wide consortium including companies, NGOS and other partners^{ix,19}. As of 2013, there were approximately 270 cinnamon farmers that supplied to the Cassia Co-Op²⁰, which is a small proportion of the approximately 17,000 cinnamon farmers²¹ in Kerinci district.

KEY PRIVATE SECTOR ENTRY POINT:

Companies train smallholders in their supply base, including on climate smart agriculture practices.

- **This can be further incentivized with co-funding and facilitation of partnerships between companies, consultancies, NGOs and government.**

This can be enabled by:

- **Supporting smallholders to secure land title**
- **Co-funding company training programs**
- **Establishing multi-stakeholder Centres of Excellence for smallholder training**

^{ix}IDH, McCormick, Unilever, Nedspice, Intersnack, Kerry, Olam, Kutas, Intersnack, Euroma, Verstegen, ITC India, Jayanti, Harris Freeman, Griffith Foods, Sabater, Royal Tropical Institute, Icco-Cooperation, Rainforest Alliance, SNV and others

SMALLHOLDER REPLANTING



- Improving farmer productivity, to reduce expansion into remaining forest
- Incentivize agriculture practices that reduce emissions, through financing conditions

Rubber, oil palm, and coconut yields have fallen in Indonesia as tree crops and palms age. After 20 – 25 years, rubber and oil palm should be replanted to maintain yields. Coconut has a longer lifespan, with replanting occurring around 60 years. In Jambi province rubber, oil palm, and coconut are key smallholder crops.^x

Rubber replanting is needed for at least 400,000 ha in Indonesia²², though likely higher given the government’s replanting targets. In 2016, a target of replanting 1 million ha of rubber was reported, which will be met by providing subsidized loans²³ from a government fund of Rp 10 trillion (approx. USD 750 million), and providing free corn seeds to plant as an alternative source of income until the rubber begins to yield (typically four to seven years).²⁴ In 2017, it was reported that the government would start replanting rubber in 2018 with target of at least 15,000ha/per year²⁵, and that funds will be collected from exporters to finance the program. No data on replanting needs for rubber in Jambi province were identified.

Efforts to introduce Improved Genetic Planting Material (IGPM) for rubber in Jambi began in the 1980s, with the government/World Bank Tree Crops Smallholder Development Project (TCSDP), PSP2, P2KP2, and INPRES-BANDES (Instruksi Presiden, Presidential Instruction for Special Grant Programmes – annual cash grant to villages). These were followed by the establishment of local seedling nurseries, certified by the Indonesian Rubber Research Institute (IRRI), including individual farmer clone nurseries and a clone nursery developed between

^xCoffee in Indonesia is not experiencing the same level of replanting crisis as other crops and it is not considered a financing priority. Pulpwood is not being grown by smallholders, and cinnamon is planted by farmers as a side crop/ investment. Very little cocoa is planted in Jambi.

CASE STUDY

PT Tania Selatan

In South Sumatra, PT Tania Selatan Mill is providing replanting finance for 2,700 independent smallholders with 5,500 ha.

USD 4,000 per ha (replanting & cost to maturity) is repaid over 15 years. The rate of interest is expected to be around 10 percent.

Loan and interest repayments are deducted from the Fresh Fruit Bunch (FFB) revenue smallholder deliver to the mill, until the loan is fully repaid.

Risk-sharing partners include Wilmar (PT Tania Selatan) Nestle, and IDH and there is an offtake agreement with L’Oréal.

CASE STUDY

Smallholder Credit Scoring

In Jambi province, SNV (a Dutch NGO) and Financial Access (a financial services firm) have developed a portfolio-based approach for smallholder financing.

Credit scoring of some or all the smallholder farmers in a supply shed is undertaken. The credit risk scoring tool estimates the impact of financial, household and production variables on the cash flows of palm oil farmers. The tool provides insight into future capability to repay loans, thereby greatly reducing credit risk.

Using the results of the credit scoring tool, a portfolio of bankable farmers within a single supply shed is marketed to banks and other investors.

Once an investor is secured, Financial Access will work with them to implement the internal operational procedures to manage and disburse the loans.

This work is part of the Millennium Challenge Account Indonesia, Berbak Green Prosperity Partnership Programme which ends mid-2018.

PT Brahma Bina Bakti (PT Triputra Agro Persada Group), GAPKINDO and the Center for Policy and Implementation Studies (CPIS). However, many smallholders still plant local wildlings gathered from existing plantations or high-yielding clones.

Oil palm replanting is needed for an estimated 2.4 million ha in Indonesia^{xi}, a target announced by the Directorate General for Estate Crops (the agency within the Ministry of Agriculture responsible for replanting) in August 2017. Of this, 400,000 ha is to replace old crops, and the remaining 2 million ha, poor quality planting material.²⁶ Others have estimated this slightly higher at least 175,000 ha each year for the next 15 years (2.6 million ha), at an annual cost of USD 700 million.²⁷

In Jambi, a 20,000 ha oil palm replanting program is being planned for six districts, including Muaro Jambi, Batanghari, Tanjung Jabung Barat, Bungo, Merangin and Tebo. At the provincial level, the Dinas Perkebunan (the provincial estate crop services) and the districts are responsible for identifying areas for replanting and facilitating disbursement of funds.²⁸ As of January 2018, Dinas Perkebunan Jambi and the district (Bupati) governments had proposed 3,016 ha for to the DG Estate Crops for inclusion in the program.²⁹

Badan Pengelola Dana Perkebunan Kelapa Sawit (BPDP-KS) or the Indonesian Palm Oil Plantation Fund Management Agency provides a Rp 25 million (approx. USD 1,800) grant per ha to smallholder farmers for replanting and land clearing.³⁰ It is anticipated that each head of household growing oil palm will receive sufficient funds to replant two ha. As replanting will cost between Rp 40 – 60 million per ha, this grant will only cover half of the cost of replanting. Replanting is being jointly implemented by the Ministry of Agriculture and the BPDP-KS³¹ and is to be funded by a levy on crude palm oil (CPO). To access the funds, groups of smallholders must submit an application, including evidence that all members of the group have land title and meet the Indonesia Sustainable Palm Oil requirements. These application requirements, especially the requirement for 'clean and clear' land title has been a major impediment to

^{xi}The total area of smallholder oil palm is reported at 4.7 million ha in Indonesia, so this target is just over 50 percent.

implementation. Several years after announced, the replanting program was finally launched in South Sumatra by President Joko Widodo in late 2017 (for 4,100 ha) followed by a 9,109.29 ha area in North Sumatra.³² BPD-PKS has set a target of replanting 185,000 ha for 2018.³³

Access to high quality seedlings can increase smallholder oil palm yields. Differences in yields between scheme and independent oil palm smallholders has been estimated anywhere from 10–15 percent³⁴ to 11–48 percent,³⁵ and as part of smallholder ('plasma') schemes, companies provide seedlings, and later deduct costs from the sale of the smallholder's FFB to the mill. There are 15 oil palm seed producers that have been approved to sell certified seed.^{xii, 36}, as well as a franchising system (*Waralaba* in Bahasa Indonesia) with 29 agents, operated by the Indonesian Oil Palm Research Institute (IOPRI)/Pusat Penelitian Kelapa Sawit (PPKS). While it is illegal to buy non-certified seeds, independent smallholders may not have access to a nursery, may not have the finances to buy high-quality seeds, or may not have land certificates, which are required to buy seeds. As a result, there is reportedly widespread practice in Indonesia of selling fake seedlings as well as planting seedlings grown from nearby oil palms.

Ten years ago, 50 percent of coconut palms in Indonesia were reported to be over-aged or 'senile'³⁷. While the current status is unknown, Indonesia's National Statistical Agency BPS continues to report a declining coconut area. In 2017, as part of a visit to North Sulawesi, the Minister of Trade stated

KEY PRIVATE SECTOR ENTRY POINT:

Companies and banks facilitate financing for smallholder replanting.

Companies can act as loan originators (deducting repayments from deliveries), and/or as a guarantor for banks on behalf of smallholders. Banks, also private sector actors, can provide loans to smallholders for replanting. Restrictions on who can receive the finance based on their practices can further incentivize low emissions practices.

Anecdotally, palm oil companies have reported that the administrative burden and financial risk means financing smallholders is not an attractive option. Further, they stated the cost of the loans being offered by development finance institutions (DFIs) is too high – over 11 percent interest can't compete with domestic banks.

This can be enabled by:

- Supporting smallholders to secure land titles
- Development of bankable portfolios of smallholders
- Concessional finance for smallholder replanting (noting previous caveat)

^{xii}PT Socfin Indonesia, PT PP Lonsum Indonesia, PT Bina Sawit Makmur, PT Tania Selatan, PT Dami Mas Sejahtera (PT Smart Group), PT Tunggal Yunas Estate (Asian Agri Group), PT Sara Inti Pratama, PT Bakti Tani Nusantara, PT Sarasan Ehsan Mekarsari, PT ASD-Bakrie Oil Palm Seed, PT Dura Inti Lestari, PT Perkebunan Nusantara IV, PT Aneka Sawit Lestari and PT Gunung Sejahtera Ibu Pertiwi (GSIP/Astra Group)

that coconut plantations are old and need to be rejuvenated.³⁸ In late 2017, the inaugural meeting of the Koalisi Kabupaten Pemerhati Kelapa (KKPK) or Coalition of District Coconut Observers was held in Jambi, bringing together representatives from 95 districts across Indonesia, with the aim of reviving the industry. As part of this meeting, it was reported that the government has set up a Rp 1 trillion fund for replanting Indonesian coconut plantations, of about 30,000 ha.³⁹ Cargill, a US agribusiness, has a coconut seeding distribution program in North Sulawesi that donated 10,000 seedlings in 2011 and a further 20,000 seedlings (in partnership with Winrock International) in 2013,⁴⁰ which is likely equivalent to only 200 ha^{xiii,41}.

Financing smallholders to replant can increase yields and reduce the need for expansion, and therefore is a tool for reducing emissions. Models for structuring smallholder finance include for example providing a corporate loan to a mill or factory which they disburse either to a cooperative (KUD) or directly to a re-planting company; providing a Micro, Small & Medium Enterprises (MSME) loan directly to a KUD, which they use to pay a re-planting company; or providing a MSME loan directly to a farmer.⁴² The loan originator could be a bank or an agribusiness company, and concessional finance from impact investor or DFI could be used to lower their lending risk, as an incentive for them to lend to smallholders.

Financing smallholders carries several types of risks for investors and guarantors. Side-selling, where smallholders sell to other processing units instead of delivering product to the one that is linked to the financing is a key issue. The income gap between planting and yields is unattractive for lenders, as this can be up to four years for palm oil and rubber. When financing is specifically for replanting, there is a risk that smallholders may use the loans for household expenses, which would negate the climate impact of the financing – though this risk could be managed by channeling funds from a KUD directly to replanting companies. Finally, many farmers are already carrying a high debt load which makes them un-bankable.

KEY PRIVATE SECTOR ENTRY POINT:

Seed companies improve access to certified seedlings for independent smallholders.

Increased production and distribution of planting material by Government-approved oil palm seed companies and rubber nurseries are an entry point reduce emissions in Jambi.

This can be enabled by:

- **Assessing barriers and incentives in Jambi province/targeted districts for seedling access**

^{xiii}Assuming planting 9 m x 9 m x 9 m triangles (143 trees/ha) where 130 plants achieve the estimated production life, see Kumaunang and Lolong's (2012) work on Sulawesi coconut.

MORATORIA, CONSERVATION, AND RESTORATION



- **Protect existing carbon stock**
- **Increasing carbon stock, through restoration/carbon sequestration**
- **Reducing emissions from peat drying**

Oil palm and pulpwood concessions cover around 40 percent of Jambi province, and while the current area under industrial rubber plantations is small, a new large industrial rubber plantation is under development. Across Indonesia, research has identified 6.1 million

ha of undeveloped forest and peatland within existing oil palm concessions, including 1,532,364 ha of peat, 3,505,012 ha of forest and 1,086,881 ha of peat forest equivalent to 30 percent of the concession area. Only 271,493 (or five percent) of concessions in Sumatra are undeveloped; Astra Agro Lestari, Salim Group/ Indofood Resources and Genting Plantations have landbanks in Jambi and were identified as having 'stranded assets' (i.e. unanticipated or premature write-downs) due to the NDPE policies in place.⁴³ Research undertaken across Sumatra found that between 2000 – 2010 oil palm development within legal concession boundaries was associated with land use change of at least 289,406 ha of lowland forest, 383,518 ha of peat swamp forest, 4,744 ha of mangrove, and 1,000 ha of lower montane forest.⁴⁴

Jambi's Berbak peatland ecosystem holds around 0.5 percent of global tropical peat carbon. Peatlands are concentrated in the three eastern districts, and make up approximately 21 percent of the provincial land area.⁴⁵ In 2017, Badan Restorasi Gambut (BRG) or the Peatland Restoration Agency and the Jambi provincial government signed an agreement to accelerate the restoration of peat. Berbak National Park is the second largest peat swamp reserve in South East Asia, covering 162,500 ha of the Berbak peat ecosystem (which totals 250,000 ha).⁴⁶ It has been calculated that this ecosystem stores 45 million metric tonnes (mt) of carbon.^{xiv, 47} Indonesia holds up to 60 gigatons (Gt) of carbon stores, two-thirds of the 88.6 Gt of carbon held globally in tropical peat.^{48, 49}

^{xiv}The carbon density of Jambi's peat has been calculated at 54.5 kg C/m³

CASE STUDY

Sinar Mas Moratorium

Asia Pulp and Paper (Sinar Mas Forestry), who control the pulpwood concessions in Jambi, declared a moratorium on natural forest clearing in February 2013.

Golden Agri Resources (Sinar Mas Group) committed to a Zero Deforestation footprint in all its new plantations, in addition to protecting High Conservation Value (HCV) areas and avoiding peat.

CASE STUDY

Biodiversity enrichment

Jambi palm oil company PT Humusindo Makmur Sejati has undertaken experimental work to enrich their concessions with tree islands.

A five-year moratorium on new licenses for establishing oil palm plantations was declared in July 2016 by the Indonesian president, but has not been formally issued.

In 2016, the Environment and Forestry Minister reportedly gave the order to stop issuing new permits for palm oil in convertible production forests,⁵⁰ reject requests for forest-release permits and cancel in-principle approvals of concession areas.⁵¹ As of January 2018, a draft presidential instruction on the Evaluation and Postponing of Palm Oil Permits was reported to be signed by the Coordinating Minister for Economic Affairs and passed on to the cabinet secretary.⁵² A moratorium on new concessions in primary forests and peatlands was issued in 2011^{xv},^{53, 54} initially set for two years, extended three times, most recently in July 2017.⁵⁵

The 'Protection and Management of Peat Ecosystems' regulation was issued in 2014 and strengthened in 2016.

It prevents planting on peat in existing concession areas and instructs companies to restore peatlands in areas where these have been degraded.^{xvi},⁵⁶ This sits alongside a Ministry of Agriculture regulation^{xvii}, which allows peat to be used for oil palm plantations, provided that the peat soils are less than 3m deep. According to national peat maps, approximately 80 percent

of all Indonesian peatlands are less than 3m deep, which means they could be converted under current regulations.⁵⁷

On peatland, the regulatory framework for restoration in existing concessions still has legal uncertainty. Anecdotaly, companies report contradictory regulations, and some environmental groups have criticized the regulation's requirement to only protect 30 percent of peat domes, as the hydrology of domes means any draining will impact the entire system.⁵⁸ In late 2017, the Indonesian Supreme Court threw out a Kementerian Lingkungan Hidup dan Kehutanan (KLHK) or the Ministry of Environment and Forestry regulation issued earlier in the year⁵⁹, which would have required companies to convert peatland ecosystems into protected areas, and restore them through rewetting and revegetation. Opposition came from businesses, labour unions and politicians, concerned about the impact on the pulp and paper industry.⁶⁰ At the same time, the Jakarta State Administrative Court ruled that Riau Andalan Pulp and Paper (RAPP/APRIL) must conserve the peat forests within its existing concessions, as per the 2016 Presidential Regulation No. 57.⁶¹

In Jambi 'No Deforestation, No Peat, No Exploitation' (NDPE) policies have been adopted by a number of palm oil companies, rubber buyers, and the sole pulp and tissue producer.

These NDPE policies act as a voluntary moratorium on development in high carbon stock forests and peatlands and include supporting the restoration of forests and peatlands where feasible.^{xviii} Further,

^{xv}Presidential Instruction (Inpres) No. 10/2011, Inpres No. 6/2013, Inpres No. 8/2015 and Inpres No. 6/2017

^{xvi}Presidential Regulation No. 71/2014, and Presidential Regulation No. 57/2016

^{xvii}Ministry of Agriculture Regulation No. 14/Permentan/PL.110/2/2009

^{xviii}The first NDPE policy developed out of work that The Forest Trust (TFT) undertook with APP/Sinar Mas, including their 'no deforestation' Forest Conservation Policy, launched in 2013. TFT and Climate Advisors subsequently negotiated adoption of an NDPE policy by Wilmar, and other major producers and traders followed suit, in many cases adopting the same policy language. TFT has a membership system where companies commit to no deforestation, and TFT then provides consultancy services for development of policies and implementation. Not all companies that have adopted NDPE policies are TFT members.

companies that are implementing voluntary certification standards such as the Roundtable on Sustainable Palm Oil (RSPO), International Sustainability & Carbon Certification (ISCC) for palm oil, Programme for the Endorsement of Forest Certification (PEFC) or Forest Stewardship Council (FSC) for timber, pulpwood and rubber, or Rainforest Alliance for cinnamon, should not convert high conservation areas or primary forest areas. See Annex 1 for a list of company commitments.

Efforts have been made to change Indonesia law, which requires that concession holders fully develop the areas within their concessions and does not allow set-aside of areas for conservation^{xix}. IFC's Biodiversity and Agricultural

Commodities Program (BACP) supported Fauna & Flora International (FFI), an NGO to formulate a draft local regulation to legalize the protection of High Conservation Values (HCVs) within concession areas in West Kalimantan and technical recommendations to change land use categorization in order to protect HCV forest.⁶² The Forum Kelapa Sawit Berkelanjutan Indonesia (FoKSBI), a multi-stakeholder platform led by the DG Estate Crops and supported by UNDP, has been facilitating a series of technical discussions between key government departments in an effort to better define a nationally accepted definition of 'HCV areas'.⁶³ As part of this process, the regulation for Kawasan Ekosistem Esensial (KEE) or Essential Ecosystem Areas⁶⁴ has been identified as a potential route to conserving areas within existing oil palm concessions.

Land swaps between HCV areas (within concessions) and degraded lands (unallocated areas within the forest estate) could be an important conservation opportunity in Indonesia, but so far have failed to materialise.

Stakeholders involved in past proposed land swaps cited a number of reasons for failure, including lack of agreement on a definition for degraded land, inconvenient location of degraded land (far from company infrastructure), existing human activity on degraded land, administrative challenges and lack of a single agreed map of land uses and concessions. A 2017 KLHK regulation included a provision for land swaps, if > 40 percent of the concession area was found to be peatlands requiring protection, however this regulation was recently struck down by the Supreme Court.⁶⁵

^{xix}Under a 2014 revision to the Plantation Act, any area under a HGU permit must be fully cleared and converted for its intended purpose within six years of the license being granted, and if not, can be seized by the state.

CASE STUDY

Sustainable Commodities Conservation Mechanism

The Sustainable Commodities Conservation Mechanism (SCCM) was established to link conservation and restoration projects to global commodities markets. In 2018, the SCCM's proof of concept helps palm oil growers respond to a new framework from the Roundtable on Sustainable Palm Oil (RSPO) that requires member companies to compensate for deforestation in their operations since 2005.

The finance generated through this mechanism will provide predictable, long-term support to high-priority ecosystem restoration and conservation projects across Indonesia, with potential for scale to other sectors and regions. The SCCM is managed by Lestari Capital, an environmental enterprise that specializes in the identification, vetting and matching of high-impact projects to market-linked finance.

KEY PRIVATE SECTOR ENTRY POINT:

Companies conserve forest within their oil palm, pulpwood and rubber plantations.

In Jambi, companies should actively map and seek to conserve High Conservation Value areas and High Carbon Stock areas within their concessions.

This can be enabled by:

- Work on the regulatory framework that would allow companies to set aside areas within their concessions to protect High Conservation Value areas and High Carbon Stock areas.
- Continued support for spatial mapping initiatives such as One Map

KEY PRIVATE SECTOR ENTRY POINT:

Companies re-wet and protect peatlands within their oil palm and pulpwood plantations.

The oil palm and pulpwood concessions in Jambi are partially located on peatlands. Therefore, companies should work to re-wet and restore these areas, including working with other actors within the peat dome, and considering current local uses (e.g. fishing, transport).

This can be enabled by:

- Clarification and further development of regulations on protection of peatland inside concessions
- Support for and coordination of Badan Restorasi Gambut (BRG) peatland mapping.

KEY PRIVATE SECTOR ENTRY POINT:

Companies and investors support conservation and restoration projects outside concession areas.

This can be enabled by

- Support for conservation financing mechanisms such as the SCCM
- Clarifying the relationship between carbon credits and NDCs ('nesting')

Ecosystem Restoration Concessions (ERCs) were launched by the Indonesian government in 2004. An ERC is a 60-year concession license granted to private companies, with the purpose of restoring ecosystems. Three types of use are permitted: Area use (ecotourism, animal conservation), ecosystem services (e.g. carbon, water) and production/collection of non-timber forest products. ERCs should be operated as a commercial business, but it has been anecdotally reported that companies are struggling to find income streams to sustain restoration operations, while at the same time dealing with encroachment and social conflict. To date 15 licenses have been issued, equivalent to over 570,000 ha (from a total of 60 applications). A total of 3.9 million ha has been allocated nationally, including future ERCs, equivalent to 14.5 percent of Indonesia's production forest. The first ERC license in Indonesia was issued in 2007 to Hutan Harapan in Jambi (founded by Burung Indonesia, Birdlife International and the Royal Society for the Protection of Birds), and a second ERC in Jambi was granted in 2015 to PT Alam Bukit Tigapuluh, a joint activity of World Wildlife Fund (WWF), Frankfurt Zoological Society and the Orangutan Project.⁶⁶

CASE STUDY

Salat Orangutan Conservation

PT Sawit Sumbermas Sarana (SSMS), an Indonesia palm oil company, jointly purchased 1,434 ha land with the Orangutan Land Trust, an NGO in Central Kalimantan, to expand a rehabilitation area for orangutans operated by the Borneo Orangutan Survival Foundation.

The land, located outside the PT SSMS plantation area, is classified as an Essential Ecosystem Area, which is under the control of the local government (and therefore outside of the Forest Estate and the control of the Ministry of Forestry).

FIRE MANAGEMENT



- Protect existing carbon stock
- Reduce emissions from mineral forest fires
- Reduce emissions from peat fires

In Indonesia, fire has historically been used for land clearing and preparation for plantation crops, and 'slash and burn' for cash crops and subsistence agriculture. Fires occur annually during the dry season (also known as 'fire season') from June – October and are reportedly worse during El Niño years (due to lower rainfall). Draining and conversion of peatland contributes to the intensity of haze from fire. During the Indonesian fire and haze crisis in 2015^{xx}, large palm oil companies were accused of starting fires to open up and plant new land, while the companies cited illegal encroachment and spread of fires from adjacent areas as the cause.⁶⁷

CASE STUDY

Fire Free Alliance

The Fire Free Alliance is a multi-stakeholder group including APRIL, Asian Agri, Musim Mas, IOI, Sime Darby and Wilmar, as well as IDH, P.M. Haze and Carbon Conservation.

As part of this group, APRIL has implemented the Fire Free Village Programme where villages are rewarded on an annual basis up to Rp 100 mill. (USD 7,614) per village if they do not start fires.

Fire is also used as a tool for land acquisition. This broadly falls into two categories: Smallholder farmers looking to expand their holdings, and rogue operators (often from other provinces) clearing forests for land acquisition. There is strong incentive to continue this practice, as studies show oil palm planted on newly opened sites can generate over USD 3,000/ha within just three years and there is reportedly little enforcement of laws against burning and encroachment.⁶⁸

In Jambi, fire has historically been a large source of GHG emissions. During the haze crisis in 2015, financial losses in Jambi were estimated at Rp 12 trillion (USD 870 million).⁶⁹

During the period 2002 – 2012, it was calculated that fire was responsible for 34 percent of annual net GHG emissions from forests in Jambi.⁷⁰ As of September 2017, Jambi administration's Land and Forest Fire Task Force data showed 488 ha of active fires in seven districts: Batanghari, Bungo, Tanjung Jabung Barat, Muaro Jambi, Sarolangun, Tebo and Tanjung Jabung Timur.⁷¹ In late 2017, Rp 4 billion (approx. USD 295,000) was allocated to Jambi province for land and forest fire protection, which was disbursed to the

^{xx}According to the government, 2.6 million ha of Indonesian land burned between June and October 2015, including 123,000 ha in Jambi province.

military, the police and the district governments affected by fire. An MoU for setting out roles and responsibility for tackling fires has been drawn up by the Jambi Disaster Mitigation Agency and signed by relevant stakeholders.⁷²

Government efforts to reduce fires include enforcement of regulations, as well as cooperation with neighboring nations and technological solutions. Illegal burning of vegetation to clear land has a maximum penalty of 10 years in jail and a Rp 10bn (\$692,000) fine, and illegal burning of forests has a maximum penalty of 10 years in jail and a Rp 1.5bn fine. According to police data in 2016, 454 individuals were arrested in connection with fires, up from 196 arrests in 2015.⁷³ In 2015, it was reported that senior executives from seven companies were arrested on charges of “environmental mismanagement” for their role in the fires. However, by mid-2016 it was reported an investigation into 15 companies linked to the fires was closed.⁷⁴ In 2014, the Indonesian government ratified the 2002 Asean Agreement on Transboundary Haze Pollution, an agreement that sets out cooperation on taking measures to prevent, monitor and mitigate the haze, by controlling the sources of fires. The Indonesian government has also used technical solutions such as ‘cloud seeding’, whereby chemicals are released to induce rain and clear haze.⁷⁵

Private sector NDPE pledges contain a commitment to ‘no burning’. In Jambi, the companies that have made these pledges (see Annex 1) include palm oil companies, rubber buyers, and the sole pulp and tissue producer. Further, companies that are implementing voluntary certification standards such as the RSPO (oil palm), FSC and PEFC (for timber, pulpwood and rubber) also have an imperative not to burn if they are to maintain their certification.

CASE STUDY

District Firefighters

PT WKS, a key supplier to Lontar Papyrus in Jambi, has organised 20-person Firefighting and Safety Units in each district where it operates, covering about 30,000 ha. PT WKS provides training to these units and involve communities in fire prevention and control activities. Firefighting squads on the ground, known as Regu Pemadam Kebakaran (RPK), undertake forest fire prevention efforts both within APP and its suppliers’ concessions, as well as outside of concession perimeters (to a maximum radius of 5 km).

They have identified and mapped High Fire Risk areas, and use land and aerial patrols, fire observation towers and satellite monitoring.

In 2016, PT WKS parent company Sinarmas Forestry developed a new system that combines information from multiple sources to accurately map the emergence of hotspots in near real-time. The system collects Geospatial Information System (GIS) data and overlays this with maps and geothermal imaging captured through aircraft monitoring. The aircraft patrols APP suppliers’ concessions in Sumatra for six hours per day, scaling up or down based on the Fire Danger Rating System.

This system accounted for USD 5 million, out of the USD 20 million investment by APP-Sinar Mas in 2016 for fire prevention.

KEY PRIVATE SECTOR ENTRY POINT:

Companies support smallholders and communities to prevent fires, adjacent to their oil palm, pulpwood and rubber plantations.

This can include providing incentives for not burning (see case study), education, and providing low-cost access to mechanical land clearing equipment.

- **Continued development and enhancement of geospatial monitoring of fires.**
- **Enforcement of regulations on illegal burning.**

SUSTAINABLE FOREST MANAGEMENT

ERCs potentially offer a long-term route to private sector restoration and commercial harvest, as they are degraded timber concessions awarded to companies for the purposes of restoration. However, no timber harvesting is permitted in ERCs until the 'ecosystem balance' is reached.

Jambi's natural forests have limited remaining high value timber, as the forest concessions were depleted and then abandoned.

Log production fell from 1.49 percent of the national total in 2003 to just 0.14 percent in 2015, equivalent to 8,340 m³.⁷⁶ At its peak, Jambi province had 17 concessions for harvest of natural forests, now reduced to just two, and much of the area has now been converted to pulpwood plantation forestry and oil palm concessions. If significant incentives were introduced, such as access to low interest loans, long-term rights of 40+ years, or fiscal incentives such as concessional taxes, preferential tariffs and subsidies, it may be possible to incent commercial operators to take on degraded concessions, with the purpose of restoring for SFM. It is likely that the type of license or regulations associated with the license would need to be amended.

ERCs potentially offer a long-term route to private sector restoration and commercial harvest, as they are degraded timber concessions awarded to companies for the purposes of restoration. However, no timber harvesting is permitted in ERCs until the 'ecosystem balance' is reached.

Restoring commercial timber species and producing an annual sustained yield of timber holds potential for maintaining

CASE STUDY

Community Sourcing

In South Sumatra, PT Xylo has been buying pulai from local communities since 1995, including over 70,000 farmers in Musi Rawas District, on 221,000 ha of community lands and in 20 sub-districts. Communities grow pulai next to rubber and in home garden plantations.

In 1997, a community-company partnership was established for 5,000 ha of plantations on the communities' lands (funded by the Dana Reboisasi). Planting materials and management of the plantation was provided for 11 years. However, it was not regarded as successful as yields and revenue were below expectations and farmers were disenchanted.

PT Xylo produces FSC certified pencil slats from pulai, which are sold to Faber-Castell, one of the world's largest manufacturers of pens, pencils, and other office supplies.

PLEDGE

Community Plantations

In Jambi, PT WKS, the largest supplier to Lontar Papyrus, initiated two plantation partnership schemes with the communities within and around their concessions.

1. Hutan Rakyat Pola Kemitraan or Community Forest Partnership plantations on private lands.

2. WKS-Hutan Tanaman Pola Kemitraan or Timber Plantation Partnership on areas where the concession overlapped with lands claimed by communities.

PT WKS would pay the standard labor wages for planting and maintenance activities. In both schemes, the plantation developed 90 percent of the areas stipulated in the agreement; while the remaining 10 percent was allocated food crops, cash crops, and fishponds. The contract period was for 43 years.

However, due to continued conflict with the communities over land rights, partnership operations were suspended. The conflict is ongoing and resulted in the death of a community member by company security guards in 2015. The Rainforest Action Network (RAN) continues to campaign against APP/Sinar Mas on this conflict.

or increasing carbon stocks. Examples of native species with commercial value that are found in Jambi province include meranti (*Shorea curtisii*) and ironwood (*Eusideroxylon zwageri*). Dana Reboisasi (DR) or the Reforestation Fund is a national forest fund, financed by a volume-based levy paid by timber concessionaires. It was created with a mandate to support reforestation and rehabilitation of degraded land and forests. In the 1990s and 2000s it provided financial subsidies for the development of industrial timber plantations (which replaced natural forest), as well as other activities not directly related to reforestation. More recently funds have been allocated for rehabilitation and restoration activities.

Restoration of peatswamp forests may provide a future commercial timber harvest, as well as an alternative to drainage-based plantations.

In Jambi, work has been undertaken to restore the peat landscape in and around Berbak National Park since the early 2000s and has yielded detailed recommendations on restoration of peatswamp forests. The peat landscape surrounding the National Park could be developed into large-scale mixed species plantations. Recommended native timber species of commercial interest include meranti (*Shorea pauciflora*), pulai (*Alstonia pneumatophore*), jelutung (*Dyera lowii*) and rengas (*Gluta wallichii* (Hook.f.) Ding Hou). Ramin (*Gonystylus bancanus*) was previously of commercial interest, but due to its threatened status, logging has been banned since 2000 (though illegal logging of this species is known to occur). All have a minimum rotation period of 20 – 50 years. Extraction methods which limit damage to the peat would need to be used, such as the traditional *kuda-kuda* system, in which timber loaded sledges are dragged on wooden railways on the undrained forest floor⁷⁷ - though in practice this is almost always used with small gauge mining railway systems, or canals excavated in the peatlands.

Plantation-grown logs have the potential to meet local demand for wood products in Jambi, and could be exported nationally and internationally.

There is a large ready supply of rubberwood, which is harvested after the trees decline in yield (after 20+ years) or are replaced with other crops (such as oil palm). Shorter rotation tree species such as pulai (*Alstonia* spp.) have had success in South Sumatra (see case study).

Kesatuan Pengelolaan Hutan (KPH) or Forest Management Units are being promoted as key element of forest governance reform in Indonesia. KPH are a new type of public service provider under the responsibility of central, regional and district authorities, and a permanent forest management entity. The management includes long-term and short-term management plans for natural and plantation forest (HPH, HTI, HTR), village, community, cultural forests, smaller village license areas (HKm) and areas of various size without licenses (called wilayah tertentu in Bahasa Indonesia, mostly ex-license areas without considerable timber stock left).⁷⁸ In Jambi, there are reportedly 17 KPH planned, of which six have been provisionally established.^{79,xxi} The KPHP Bukit Lubuk Pekak Merangin⁸⁰ is being supported by German development bank KfW until 2022 (through their Forest Programme II).

Hutan Desa (HD) or Village Forest licenses, Hutan Kemasyarakatan (HKm) or Community-Based Forest Licenses, and Hutan Tanaman Rakyat (HTR) or Community Plantation Forest can secure communal rights and protect the forest resource against outside encroachment. These are 35-years licenses for communities to manage state forests and harvest forest products. In 2009, Lubuk Beringin in Bungo District received the first HD license. Local NGO Komunitas Konservasi Indonesia Yayasan Warung Informasi Konservasi (KKI WARSIS) has been supporting villages in Jambi to apply for HD licenses, and under this program more than 20 villages have been granted licenses for over 50,000 ha.⁸¹ In addition to HTR licenses, HTI (Industrial Plantation Forest) concession holders are required by law to allocate a maximum five percent of the total plantation area to develop a partnership program with the local community, which could include planting commercial timber plantation species.

KEY PRIVATE SECTOR ENTRY POINT:

Company restoration of degraded concessions.

Companies are incented to participate in replanting and restoration of commercial timber species, as well as incentivize harvest in line with maximum sustainable yields. Consideration would need to be given to reversals of emission reductions.

This can be enabled by:

- **Supporting implementation of the Jambi Forest Management Unit**
- **Assessing of commercial viability of restoration of commercial timber species**
- **Strengthen governance of the Dana Reboisasi and continue to build the capacity of districts and provincial agencies to effectively administer this fund.**
- **Review of regulations, licenses and length of concessions**
- **Analysis of potential fiscal incentives for restoration by timber companies**

^{xxi}KPHP Kerinci dan Sungai Penuh, KPHP Limau Sarolangun, KPHP Bukit Lubuk Pekak Merangin, KPHL Model Sungai Bram Hitam Tanjab Barat, KPHP Tebo Barat, KPHP Tebo Timur and KPHP Sarolangun Ilir

KEY PRIVATE SECTOR ENTRY POINT:

Establishment of Community Forestry.

Companies set up partnerships with communities to plant native and plantation tree crops.

This can be enabled by:

- **Supporting communities to apply for forest licenses (e.g. KKI WARSI program)**
- **Capacity building in communities for forest governance and management**
- **Facilitating supply chain links between community forestry and processing companies**
- **Facilitation of the process to define village boundaries**

BIOGAS CAPTURE



- Eliminate methane emissions from processing
- Reduce use of coal for electricity

GHG emissions from processing palm oil, pulpwood and rubber can be 'captured' when effluent is anaerobically digested in a sealed environment. Typically, wastewater is decomposed in large open lagoons, a process used to reduce the pollutant load, so it can be safely discharged. For example, when palm oil mill effluent (POME) decomposes, it forms a biogas which is typically composed of 50–75 percent methane (CH₄), 25–45 percent carbon dioxide (CO₂).

Renewable energy from waste offers additional emissions reductions compared to using electricity from the grid, and biogas project owners can sell power to Perusahaan Listrik Negara (PLN), the national electricity company.^{xxii} State-owned electricity company PLN mainly uses coal and diesel in its plants, and remote companies often rely on fossil fuel generators; substituting these with renew-ables can reduce

^{xxii}Ministerial Regulation (PERMEN) No. 21/2016

CASE STUDY

Tropical Landscapes Finance Facility

The Tropical Landscapes Finance Facility (TLFF) is considering biogas investments for POME methane capture and rural electrification.

The Lending Facility aims to provide long term capital to projects in two areas: rural electrification and sustainable agriculture where there can be measurable environmental and social impact. Both sectors respond to the government of Indonesia's NDCs under the Paris Climate Agreement. All projects are managed to TLFF's ESG Policy.

Loans to projects will be largely 10 – 15 years in duration, with a minimum size of USD 10 million. Currently, each transaction is being structured individually, however, the intention is to build targeted funds.

The TLFF is a partnership among ADM Capital/ ADM Capital Foundation, BNP Paribas (BNPP), UN Environment and World Agroforestry Centre (ICRAF).

Under the partnership, ADM Capital/ADM Capital Foundation act as Lending Facility and ESG manager, while BNPP is ADM Capital's structuring partner, arranges and sells the notes that provide liquidity to the lending facility. UN Environment and ICRAF host the secretariat for TLFF and are building a grant fund to provide technical assistance to projects.

emissions. However, the remote location of mills is also a limiting factor, as building infrastructure to access the grid is often not financially viable, and with the access to inexpensive coal, PLN is reportedly paying low prices for renewable energy. Mills have expressed concern over being the sole electricity supplier for a local grid, though partnerships with third party independent power providers could address this. Relying on revenue from Clean Development Mechanism (CDM) biogas capture projects is no longer considered financially viable, due to the low price of carbon.

Capital costs of installing POME capture for use in a mill's own boilers is around USD 1 million (cost of digester and new burner), and infrastructure costs is around USD 2.5 million to sell electricity to a low voltage grid and around USD 3 million to a high voltage grid.⁸² One producer estimated the cost of biogas-fired power plants at USD 4.5 million each.⁸³

Access to the European biofuels market is dependent on the installation of POME capture for palm oil mills. As of 1 January 2018, the European renewable Energy Directive (RED) has set GHG saving thresholds for biodiesel (compared to conventional diesel) at 50 percent for existing installations, and 60 percent for new installations. Studies have shown that 35 – 66 percent GHG savings can be achieved for palm oil biodiesel when POME methane capture is used.

There are 45 palm oil mills registered in Jambi, of which four are known to have POME biogas capture installations. These four mills belong to Bakrie, PT Smart (GAR) Asian Agri and PTPN VI. In Muaro Jambi, a feasibility study of biogas capture calculated that installing POME capture would result in emissions reductions of 32,247 mt of CO₂e per year, a savings of 82 percent compared to uncovered lagoons.⁸⁴ In addition to POME capture, Sinar Mas has applied a co-composting method at a mill in Jambi, whereby POME is sprayed on shredded empty fruit bunches, which they claim reduces emissions from POME from approximately 450 kg CO₂e/tCPO down to 20 kg CO₂e/tCPO.⁸⁵

Table 1: POME capture in Jambi province

Jambi Palm Oil Mill (Company)	Estimated POME Emissions Reductions
PT Sumbertama Nusapertiwi (Bakrie)	15,743 mt CO ₂ e/year ⁸⁶
PTPN VI Pinang Tinggi Mill	18,372 mt CO ₂ e/year
PT Kresna Duta Agroindo (GAR/ PT SMART)	13,446 mt eq/year ⁸⁷
PT Dasa Anugrah Sejati (DAS) (Asian Agri)	Inaguration Dec. 2017 ⁸⁸

There is one pulp and tissue mill in Jambi where black liquor is used to meet almost 60 percent of the mill's energy needs. Chemical pulp is produced by separating wood fibres from lignin, by cooking wood chips in a digester. The digester produces 'black liquor', i.e. a mixture of lye and organic substances. Energy is created by burning the gas that is created by treating the black liquor. A further 20 percent of the energy mix comes from bark and wood waste.⁸⁹

Pulp and paper mill wastewater contains a biological sludge, which could be anaerobically digested, reducing GHG emissions, and producing biogas as a source of energy.⁹⁰ The sludge is normally mechanically de-watered and put in landfill/compost, plans are advancing at two other mills (CDM projects, outside Jambi province) to use the methane gas from the wastewater sludge to produce energy, which would replace a coal and diesel generator.⁹¹ These projects would treat 20,000 m³ of wastewater effluent per day.⁹²

Crumb rubber factories could use wastewater to generate biogas and electricity generation.

Open lagoon systems are normally used to treat wastewater from crumb rubber factories.⁹³ The GHG emissions from this process includes methane, carbon dioxide, nitrogen, and a small amount of nitrous oxide. On average, 20 m³ of wastewater is discharged for each ton of rubber produced, which results in 0.5 mt-CO₂eq/t-product.⁹⁴ There is one known example in Thailand, where the Thai Biogas Energy Company creates biogas from wastewater at a Rubber and Palm oil factory.⁹⁵ Of the eleven crumb rubber factories in Jambi, one (PT Djambi Waras, part of Kirana Megatara Group) expressed interest in biogas capture for electricity generation.⁹⁶

KEY PRIVATE SECTOR ENTRY POINT:

Companies install POME capture for palm oil and explore biogas capture for pulp and rubber.

The technology for biogas (POME) capture in the palm oil sector is well defined, and market access incentives are in place for those mills supplying the European biodiesel market.

The opportunity in the Jambi pulp and paper sector is limited to one company, Lontar Papyrus, which is already implementing a renewable energy from waste approach. There may be additional opportunity for further biogas capture. The capture of biogas from rubber processing is much less developed, though crumb rubber factories can explore opportunities.

This can be enabled by:

- Concessional finance for biogas capture installations
- Regulatory reform to incentivise purchase of renewables by the national electricity grid
- R&D and piloting biogas capture in pulp and rubber

LOW EMISSION ALTERNATIVES

Jungle rubber offers a carbon-dense, biodiverse alternative to clonal monoculture, however farmers may not have sufficient incentive to maintain this type of cultivation.

CASE STUDY

PES Jungle Rubber

In Jambi province, payment for ecosystem services (PES) agreements with four villages in Bungo to conserve 2,000 ha of jungle rubber were put in place by ICRAF, in partnership with local NGOs WARSI, Gita Buana and Lembaga Ekolabel Indonesia (LEI) or the Indonesian Ecolabelling Institute.

Seventy-nine farmers from Letung, Sangi, Mengkuang Besar, Mengkuang Kecil and Lubuk Beringin villages agreed to retain their complex rubber agroforests if incentives were provided.

As part of this project, Bridgestone North Sumatra conducted training for farmers on post-harvesting techniques. They agreed to provide premiums to the farmers for higher quality latex and bought three shipments directly from the village.

To manage governance risks, instead of cash, the communities received support to establish micro-hydro power generators, local tree nurseries and model village forests.

Agroforestry and diversification of existing plots by adding new plants and trees of commercial interest can increase biomass (and carbon storage) and may help reduce the pressure on nearby forest areas by increasing farmer incomes. Global studies have shown

diverse agroforestry systems compete for space with profitable and short-term monoculture cash crop.⁹⁷ In Kerinci, studies found that cinnamon trees created a permanent agroforest,⁹⁸ and as part of the Sustainable Agriculture Network (Rainforest Alliance) certification, local indicators consider cinnamon plots as vegetation buffers.⁹⁹ A new rubber plantation company in Jambi, PT Royal Lestari Utama (RLU), has concessions adjacent to Bukit Tigapuluh National Park (BTNP). These will be developed to form a bufferzone to help protect the National Park from encroachment.^{xxiii, 100}

Jungle rubber offers a carbon-dense, biodiverse alternative to clonal monoculture, however farmers may not have sufficient incentive to maintain this type of cultivation. It is estimated that jungle rubber accounts for 60 percent of rubber farmers in Jambi,¹⁰¹ a rubber system with complex, multi-strata canopy that resembles natural secondary forest and shares about 60-80 percent of plant species found in neighboring primary forests.¹⁰² The carbon stock of jungle rubber higher than average rubber rotational systems; a study in Bungo district found 60-year-old rubber agroforest stored around the same amount of carbon as a 25-year-old secondary forest.¹⁰³

Anecdotal evidence suggests that a significant drop in rubber price has led to replacement of jungle

rubber with clonal monoculture, to increase the yields per hectare. There is also reportedly widespread clearing of rubber trees to replace them with oil palm. Given that oil palm plantations provide more income per unit of land with less labor than rubber, incentives are needed for farmers to retain jungle rubber systems. However, jungle rubber is generally considered to be of lower quality, which means end users are not interested in payments for ecosystem services or voluntary certification.¹⁰⁴

Planting agriculture crops and commercial tree crops which can be grown on (re) wet peat soils, as an alternative to drainage-based agriculture, can reduce emissions from peat drying and may increase the carbon stock of plots. Paludiculture is the cultivation of biomass on wet and re-wetted peatlands. In Jambi,

opportunities for alternative livelihoods on re-wetted peat include edible fruit trees (e.g. *Durio carinatus*, *Nephelium* spp., *Mangifera* spp., *Garcinia* spp.), rattan palms (*Korthalsia flagellaris*, *Calamus* spp.), fat/oil-producing plants (e.g. *Shorea* spp., *Palaquium* spp.), latex-producing trees (e.g. *Dyera polyphylla*, *Palaquium* spp.), resin-producing trees (*Shorea* spp.), dye/tannin-producing plants (e.g. *Fibraur eatinctorial*), fibre plants (e.g. *Pandanus* spec., *Lepironia articulata*), medicinal plants (e.g. *Alseodaphne coriacea*, *Ilex cymosa*), and sago palms (*Metroxylon sagu*) can be milled locally to make starch.

CASE STUDY

Hutan Kemasyarakatan

Farmers in Jambi cleared peatland and planted oil palm, jelutung, coconut and coffee.

After coming into conflict with the local forestry office, ICRAF facilitated a solution where the land was re-planted with mango (*Mangifera indica*), durian (*Durio zibethinus*), jelutung and nutmeg (*Myristica fragrans*). ICRAF helped the farmers obtain a Community-based Forest Management (Hutan Kemasyarakatan/ HKM) permit.

KEY PRIVATE SECTOR ENTRY POINT:

Investment in processing and export companies trading in low-emission-alternative commodities.

Market-driven approaches are more likely to be self-sustaining, and therefore represent an important long-term opportunity.

This can be enabled by:

- **Market studies and feasibility analyses for potential alternative crops**
- **Concessional finance for building processing facilities for high potential alternatives**
- **Sensitisation and training of farmers (government and NGO extension)**

^{xxiii}The Tropical Landscapes Finance Facility issued Asia's first corporate sustainability bond to fund PT RLU to develop its plantations and strengthen conservation and community partnership programs. A second tranche of funding expected in late 2018 will include rubber outgrower and plasma schemes.

Indonesia is the world's only commercial supplier of jelutung latex, with a single international buyer. *Jelutung Dyera* was historically a commercially important species and has already been planted as part of peatland restoration and alternative livelihood activities in Jambi. There is a single Indonesian company, PT Sampit in Sampit, Central Kalimantan, exporting Jelutung. There is one remaining international buyer for Jelutung latex, Lotte Co, a multi-national with headquarters in South Korea and Japan. Between 2010 and 2015, Indonesia shipped an average of 150 mt per year.¹⁰⁵ As a comparison, during peak production in the early 20th century, the United States alone averaged 14,000 mt imports annually.¹⁰⁶ Without significant market demand, jelutung is unlikely to be a commercially viable alternative to oil palm or rubber.

KEY PRIVATE SECTOR ENTRY POINT:

Rubber companies and their supply chains explore payment agreements for maintaining jungle rubber.

Work by ICRAF, Bridgestone and their partners suggest this may have potential. As more rubber companies make NDPE commitments, this could form part of a zero-net-deforestation approach.

This can be enabled by:

- Facilitation of discussions with the new rubber plantation company in Jambi, PT RLU (and their JV partner Michelin)
- Co-funding Payments for Ecosystem Services for 'jungle rubber'

RESPONSIBLE & JURISDICTIONAL SOURCING



- Incent emissions reduction activities by producers

For over 20 years, companies have used certification to encourage responsible practices by producers.

Certification typically involves a standard, third-party auditors, and a governance system that defines the process, including approval of auditors, review and update of the standards, rules for communication, grievance procedures etc. In the late 1980s, the Rainforest Alliance launched the world's first forestry certification program, followed by the FSC in 1994, and many other multi-stakeholder, voluntary standards in forestry and agriculture over the past two decades followed.

Sustainably certified oil palm, tissue and cinnamon are available from Jambi producers. According to available information, there are 54,829 ha of RSPO certified oil palm estates in Jambi province, belonging to RSPO members Asian Agri, GAR, Wilmar, Sime Darby and Triputra Agro Persada. This is equivalent to approximately eight percent of the oil palm plantation area recorded in Jambi province in 2015.^{xxiv} These companies are also ISCC certified. Lontar Papyrus (Sinar Mas Group) is the only pulp mill in Jambi, and it is certified under the LEI standard, which is endorsed by PEFC. One of its subsidiary suppliers is PT Wirakarya Sakti, which manages the largest certified forest in Indonesia, and exclusively supplies Lontar⁰⁷. Lontar produces 100 percent LEI/PEFC certified pulp from logs, and 100 percent LEI/PEFC certified tissue (of which 70 percent is from its own pulp and 30 percent is procured from the market)⁰⁸. Cassia Co-Op, a cinnamon processing and export company, has Rainforest

^{xxiv}Calculated using companies and area reported Dinas Paekebunan Provinsi Jambi, Statistik Perkebunan Tahun 2015 (hardcopy), cross-referenced with the RSPO database on certification <https://rspo.org/certification>

CASE STUDY

RSPO Certified Smallholders

Jambi is home to one of the world's first RSPO certified independent smallholder groups.

Gapoktan Tanjung Sehati is an RSPO pilot project and received the second RSPO group certificate for independent smallholders in the world. Based in Merangin district, they have 350 members with 450 ha of palm oil, which they can deliver to PT Sari Aditia Loka (SAL), PT Agrindo Indah Persada (a Wilmar Group company) or PT Bebeko.

They were supported by NGO Yayasan Setara to implement the RSPO P&C, starting in 2009, and received their group certificate in 2014.

PLEDGE

Produce-Protect Criteria

The 2015 pledge by M&S and Unilever contained the following criteria for recognising jurisdictional initiatives:

- 1. A strategy for how to reduce emissions from forests and other lands whilst increasing agricultural productivity and improving livelihoods**
- 2. A system for measuring and monitoring reductions in GHG emissions from deforestation and an established baseline**
- 3. A commitment to adhere to social and environmental safeguards and monitor these efforts**
- 4. High-level political commitment to, and support for, the compact's design and implementation from government partners**
- 5. Stakeholder engagement in the compact's development and implementation; and Location in a country with an ambitious national UNFCCC target (currently called an Intended Nationally Determined Contribution or INDC).**

Alliance certification though at the time of its certification covered less than 0.5 percent of Jambi's cinnamon farmers.¹⁰⁹

The Indonesian Sustainable Palm Oil (ISPO) is a standard and certification system, established by the Indonesian government. Initially under the Director General of Estate Crops (Ministry of Agriculture) in 2015 it was placed it under the Co-ordinating Ministry of Economic Affairs. The standard is based on existing Indonesian laws and regulations, and is audited by government-approved certification bodies. The government is seeking global recognition for ISPO. As of August 2017, 16.7 percent of oil palm plantations in Indonesia were ISPO certified.¹¹⁰

Jurisdictional certification is a new concept based on local government committing to carry out low-emission rural development, reduce deforestation, respects the rights of the indigenous community and support farmer participation in sustainable commodity supply chains. The local government establishes and leads a multi-stakeholder working group with representatives from companies, farmers, the indigenous communities and NGOs, who together will identify and agree on the risks, solutions and sustainable targets at jurisdictional level, such as reducing deforestation, farmer empowerment, developing support for rules and regulations, etc. The local government develops or adopts a transparent monitoring system.

Jurisdictional certification is in the pilot stage for the palm oil sector in Indonesia. RSPO is piloting it in Seruyan, Central Kalimantan (Indonesia), Musi Banyuasin, South Sumatra (Indonesia) and Sabah (Malaysia). Furthermore, the Ecuadorian government announced in 2017 its intention to adopt and implement the RSPO principles and criteria at the national level, which is also being referred to as a jurisdictional approach. In August 2017, RSPO issued a tender for the development of a certification system to enable the jurisdictional approach to certification.

Provincial commitments followed by district-level implementation of jurisdictional approaches shows early success in South Sumatra. A provincial-level green growth plan was developed in 2016 and launched in May 2017. The head of Musi Banyuasin district, in South Sumatra,

has committed to achieve jurisdictional certification by 2020, starting with Lalan sub-district in 2018. Project partners include IDH and WRI, as well as five foreign companies planning to co-finance the work. Stakeholders are working towards developing a verified sourcing area. Batangahri has been identified as a target sustainable district in Jambi province.

Groundwork for a jurisdictional approach in Jambi has been set out in an agreement between IDH and the Jambi Governor, signed in September 2017.

As part of this agreement, IDH will support the province to develop a Green Growth Plan.¹¹¹ The approach includes developing production, protection and inclusion compacts, agreements between farmers, companies and governments to enhance the sustainability and productivity of land and secure community livelihoods by diversifying their income sources in exchange for natural resource protection. IDH is focused on palm oil, rubber, and coffee and will link the compacts in Jambi to international markets and the financial sector.¹¹²

Preferential sourcing by global buyers is seen as critical, to incent private sector and government to take action within a jurisdiction.

In December 2015, Marks & Spencer (M&S) and Unilever pledged to 'prioritise our commodity sourcing from areas that have designed and are implementing jurisdictional forest and climate initiatives.'¹¹³ Following this commitment, a working group of experts, referred to as the 'Brain Trust' and coordinated by the US department of State, developed an expert assessment guide to assist practitioners assess whether a jurisdictional program should qualify for preferential sourcing. Separately, in late 2017 The Earth Innovation Institute launched the Produce-Protect Platform, an online dashboard with interactive maps and data^{xxv} for Brazil, Peru, Colombia, Mexico and Indonesia, allowing companies to identify jurisdictional initiatives. Discussions with retailers and manufacturers as part of this study identified concerns regarding the practical implementation of the jurisdictional approached in day to day company operations: Retailers don't normally have supply chain traceability to jurisdictions and therefore can't give preferential treatment, and even if they could, long-term purchase agreements for commodities carry operational risks.

^{xxv}Timeseries data is provide (where available) on deforestation and agricultural value, population, rural population, indigenous area, life expectancy, human development index, life expectancy, average income, poverty, birth mortality rate, forest cover, deforestation, carbon stored in forest, avoided deforestation, crop area, production, extractives, landcover, protected areas, cattle heads, cattle density, and pledges.

CASE STUDY

Blockchain for Palm Oil

Blockchain technology ensures that each transaction recorded in a ledger is digitally signed and secure.

In a palm oil supply chain, this technology could be used for traceability, either complementing or replacing existing methods.

The Technology Innovation Blockchain Lab has proposed that independent smallholders would use a mobile scanner to identify, self-grade and scan their FFB.

Traders would use a blockchain app to record the grade and quantity of FFB received from independent smallholders.

The mill would use the data transferred from the trader to verify the farm location (e.g. outside of the forest estate), and would update the transaction (including mill grading) in the app. In this model, payment would be made directly to the independent farmer.

Traceability has become an important part of company sustainability strategies, as a tool for risk management and supplier engagement approach. For manufacturers, this typically means tracing back to a mill and the known catchment area attached to the mill (also called a 'supply shed'). Mapping tools such as GFW's PALM Risk analysis or The Forest Trust's (TFT's) Starling can be used, e.g. to assess past and present forest loss in supply sheds. Unilever¹¹⁴ and Nestle¹¹⁵ became the first consumer goods companies to publish lists of palm oil mills in February 2018. Integrated traders/processors/plantation companies Wilmar¹¹⁶ and Bunge (formerly IOI)¹¹⁷ also publish mill lists. Mills themselves are working on traceability of their third-party suppliers (independent small and medium land holders), and can use software solutions such as Blunumber¹¹⁸, AkvoFlow¹¹⁹, Geotraceability¹²⁰ and Cocoa Trace and Palm Oil Trace¹²¹ (under development) to record farmer information on smartphones, which can be cross-referenced with geographic information such as forest loss, visualized and communicated to the downstream supply chain. In practice, traceability work is often undertaken through supplier questionnaires, field visits and spreadsheets, though software solutions such as String¹²² have sought to automate data collection and analysis. Work on applying blockchain technology to agriculture supply chains has also begun, focused on secure transactions between smallholder farmers and mills (see case study).

KEY PRIVATE SECTOR ENTRY POINT:

Global buyers preferentially source commodities from Jambi province.

Many companies already have policies in place to do this, though work is needed on implementing it in practice.

This can be enabled by:

- **Brokering offtake agreements between buyers and companies operating in Jambi (e.g. Produce-Protect compacts)**
- **Ensuring the Jambi jurisdictional approach is consistent with the Produce-Protect criteria, and registering the jurisdiction in the EII Platform**
- **Convening practitioners to identify ways to practically implement the jurisdictional sourcing approach**

NEXT STEPS

In Jambi province, oil palm, rubber, pulpwood, cinnamon and coffee are the most significant agricultural commodities, and the private sector companies associated with these will be an important part of the emissions reduction strategy.

Landscape approaches for emissions reductions include site-level activities by a number of companies, as well as jurisdiction-wide approaches that convene private sector, government, NGO and other stakeholders to scale impact.

The ISFL is uniquely positioned to bring its convening power, blended finance and collaborative approach to reducing emissions in Jambi province.

The findings from this rapid diagnostic study can be used by the BioCF and the ISFL team to help identify which private sector entry points and enabling activities to pursue further in the Jambi ISFL program. This may include, but is not limited to:

- Providing technical assistance to test or scale-up private sector activities that reduce emissions
- Lending through DFI to companies and/or banks
- Convening private sector engagement at the district and provincial-level
- Activities to improve the policy and regulatory environment for private sector, reduce compliance costs and minimize the distortionary effects of public spending

This approach is consistent with the MFD framework.

In the next phase, work will include determining the emissions reductions potential of the proposed activities, livelihood impacts, the financing mechanisms for the proposed activities, and roles and responsibilities for implementation.

ANNEX 1

Key Private Sector Forest Commitments

Private sector commitments to tackle deforestation in their production and supply chains are an important tool to leverage change, as they are implemented through day to day procurement of critical supplies and ingredients. For the purposes of this study, we have reviewed the commitments made by companies operating in Jambi on the following:

- NDPE pledges first launched in December 2013 by Wilmar and Unilever, and now at least over 500 companies globally, to remove deforestation from their agricultural commodity supply chains.
- The Consumer Goods Forum 'Zero Net Deforestation' Pledge, has a commitment to achieve zero net deforestation by 2020. This is endorsed by over 400 CGF members including consumer goods manufacturers and retailers from around the world.
- The New York Declaration on Forests pledges to halve the rate of deforestation by 2020, to end it by 2030, and to restore hundreds of millions of acres of degraded land and was signed by 37 governments, 20 sub-national governments, 53 multi-national companies, 16 groups representing indigenous communities and 63 non-government organizations. Over 190 organizations have now become signatories.
- Membership of roundtables that operate voluntary certification. While the standards offer different levels of protection for land use change, and membership does not mean all areas are certified, it is an indication of the company's commitment to protect High Conservation Values and High Carbon Stock.

Given the opaque, complex and dynamic nature of palm oil and pulp and paper supply chains, it is not possible to definitively identify downstream manufacturers and retailers that are sourcing from Jambi producers. Further, as the CGF Zero Deforestation Pledge includes over 400 companies, these are not all listed here. Instead, a sample of downstream companies likely to be sourcing from Jambi has been provided.

Table 1: Jambi Rubber Companies with Forest Commitments

Rubber company	Factories	Plantations	NDPE Policy	SNR-i WG	NY Forest Declaration
PT RLU (Barito/Michelin JV)	1	Approx. 70,000 ha	✓	✓	
Halcyon Agri	2	No		✓	

Table 2: Jambi Rubber Buyers with Forest Commitments

Rubber Buyers	Tire Manufacturer	Car Manufacturer	NDPE Policy	SNR-i WG ^{xxvi} /FSC	NY Forest Declaration
Michelin			✓	✓	
Bridgestone			✓	✓	
Pirelli			✓	✓	
Continental				✓	
Goodyear				✓	
Yokohama				✓	
Apollo				✓	
Nokian				✓	
GM			✓		

Table 3: Jambi Palm Oil Companies with Forest Commitments

Palm Oil Company	Mills	Inti	Plasma	Total	NDPE Policy	RSPO Member	NY Forest Declaration
Royal Golden Eagle (Asian Agri/Apical)	4	18,038	25,023	43,061	✓	✓	✓
Sinarmas (Golden Agri Resources, PT Smart)	5	14,523	25,224	39,747	✓	✓	✓
Astra Agro Lestari	3	5,847	26,149	31,996	✓		
Triputra Agro (TAP)	1	5,973	7,458	13,431		✓	
Sime Darby (Minamas)	1	2,851	5,776	8,627	✓	✓	✓
Wilmar	2	5,785	218	6,003	✓	✓	✓

Table 4: Palm Oil Buyers Potentially Linked to Jambi with Forest Commitments

Palm Oil Buyers	Trader	Manufacturer	Retailer	NDPE Policy	CGF Zero Net Deforestation	NY Forest Declaration	RSPO Member
ADM				✓			✓
Cargill				✓		✓	✓
LDC				✓			✓
Wilmar				✓		✓	✓
Unilever				✓	✓	✓	✓
Mondelez				✓	✓	✓	✓
P&G				✓	✓	✓	✓
Nestle				✓	✓	✓	✓

^{xxvi}While Forest Stewardship Council (FSC) certification is technically available for rubber plantations, in practice it is not being used by the tire industry. The Sustainable Natural Rubber Initiative (SNR-i) is a voluntary and collaborative industry project, which has defined a set of five value chain criteria for a voluntary verification system targeted on a wide stakeholder participation, on a self-certification basis.

Palm Oil Buyers	Trader	Manufacturer	Retailer	NDPE Policy	CGF Zero Net Deforestation	NY Forest Declaration	RSPO Member
Mars				✓	✓	✓	✓
Pepsi				✓	✓	✓	✓
Kao				✓	✓	✓	✓
Johnson & Johnson				✓	✓	✓	✓
SC Johnson					✓	✓	✓
Yves Rocher Group				✓	✓	✓	✓
Danone				✓	✓	✓	✓
General Mills				✓	✓	✓	✓
Kellogg's				✓	✓	✓	✓
Grupo Bimbo				✓	✓	✓	✓
L'Oreal				✓	✓	✓	✓
Tesco				✓	✓		✓
M&S				✓	✓	✓	✓
Delhaize/Royal Ahold				✓	✓	✓	✓
Walmart				✓	✓	✓	✓
McDonalds				✓		✓	✓
Sobeys				✓	✓	✓	✓

Table 5: Jambi Forest Products Companies with Forest Commitments

Pulp & Paper Company	Mills	Plantations	NDPE	FSC or PEFC Member	NY Forest Declaration
Lontar Papyrus (Sinar Mas Forestry/APP)	1 ^{xxvii}		✓	✓ ^{xxviii}	✓
PT WKS (APP)		293,812 ha (gross), planted 174,200 ha	✓	✓	✓
PT Rimba Hutani Mas			✓		
PT Tebo Multi Agro			✓		

^{xxvii}Lontar Papyrus has one pulp mill and a one adjacent paper mill in Jambi.

^{xxviii}Lontar Papyrus and PT WKS have LEI certification, which is endorsed by PEFC. In 2007, APP was disassociated from the FSC after it came out that APP had cleared areas known to be critical forest habitat.

Table 6: Pulp, Paper, Board and Tissue Buyers with Forest Commitments^{xxix}

Pulp & Paper Buyers	Paper product	Packaging	Retailer	ND^{xxx}	CGF Zero Net Deforestation	NY Forest Declaration	FSC/PEFC Sourcing
Xerox							✓
National Geographic							✓
Mondi				✓			✓
Danone				✓	✓	✓	✓
Unilever				✓	✓	✓	✓
Kraft (Mondelez)				✓	✓	✓	
Mattel				✓			✓
KFC							✓
Lego							✓
Disney					✓		✓
Hasbro				✓			✓
Acer							
HP				✓			✓
Staples							✓
Office Depot							✓
Walmart				✓	✓	✓	✓
Carrefour				✓	✓		✓

^{xxix}These companies may no longer be buyers from APP, as they are some of the 130 companies targeted by a Greenpeace campaign in 2011 'The Ramin Paper Trail', which identified illegally sourced, protected tropical hardwoods in their supply chains that they had purchased through APP's Indah Kiat Perwang's mill in Riau, and called on buyers to drop APP as a supplier. The Jambi Lontar Papyrus Mill was not mentioned in the campaign, though its parent company PT Pindo Deli Pulp and Paper Mills was. A number of these companies have committed to sourcing FSC, and Lontar is not FSC certified.

^{xxx}The 'no peat, no exploitation' part of the NDPE pledges has mainly been adopted by oil palm supply chains, therefore for pulp, paper board and tissue supply chains, we include only the 'No Deforestation' element in the table

Case Study References

Project	Further Details
Global Forest Watch Project lead: WRI	Forest - http://www.globalforestwatch.org/map Fires - http://fires.globalforestwatch.org/home/ Commodities - http://fires.globalforestwatch.org/home/
Vietnam Low Carbon Rice Project Project lead: AusAID	http://blogs.edf.org/climatetalks/files/2016/04/EDF-Project-Brief-Summary.pdf
Lingkar Temu Kabupaten Lestari/Sustainable Districts Project lead: LTKL	https://www.idhsustainabletrade.com/uploaded/2016/11/Musi-Banyuasin-Jurisdictional-Certification-Plan-1.pdf http://opengovindonesia.org/files/LP191OGcOKi6Y2VZLMpc_Session%204_Dodi%20Reza%20Alex%20Noerdin.pdf
PT Tania Seletan Project lead: Wilmar	https://www.tfaz2020.org/wp-content/uploads/2016/11/Wilmar-Financing-Sustainable-Smallholder-Replanting-2016.pdf
Smallholder Credit Scoring Project lead: Financial Access/SNV Berbak Green Prosperity Partnership (BGGP)	http://www.snv.org/public/cms/sites/default/files/explore/download/fact_sheet_berbak_palm_oil_investment_june_2016.pdf
Sinar Mas Moratorium Project lead: Asia Pulp & Paper/Golden Agri Resources/TFT	APP - https://www.asiapulppaper.com/sustainability/vision-2020/forest-conservation-policy Golden Agri Resources - https://goldenagri.com.sg/wp-content/uploads/2016/01/GSEP-English.pdf
Biodiversity Enrichment Project lead: PT Humisindo Makmur	Teuscher, M., Gérard, A., Brose, U., Buchori, D., Clough, Y., Ehbrecht, M., Hölscher, D., Irawan, B., Sundawati, L., Wollni, M. and Kreft, H. (2016). Experimental Biodiversity Enrichment in Oil-Palm-Dominated Landscapes in Indonesia. <i>Frontiers in Plant Science</i> , [online] 07. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5065973/
Sustainable Commodities Conservation Mechanism Project lead: Lestari Capital/Forest Carbon	http://www.conservationfinancealliance.org/news/2017/9/16/lestari-capital-webinar
Salat Orangutan Conservation Project lead: PT Sawit Sumbermas Sarana/The Orangutan Land Trust	http://orangutan.or.id/press-release-bos-foundation-establishes-an-orangutan-conservation-area-on-salat-island/
Fire Free Alliance Project lead: APRIL Group	http://www.inside-rge.com/fire-free-alliance-formed-ffvp
District Firefighters Project lead: PT WKS (APP/Sinar Mas)	http://www.naylornetwork.com/ppi-otw/articles/index-v2.asp?aid=371984&issueID=44690

Project	Further Details
<p>Community Sourcing Project lead: PT Xylo</p>	<p>https://www.ifc.org/wps/wcm/connect/5283cc80470e3178838dd7b2572104ea/Sustainable+Plantation+Wood+Supply+2010.pdf?MOD=AJPERES</p>
<p>Community Plantation Partnership Project lead: PK WKS/Sinar Mas Forestry</p>	<p>https://www.ifc.org/wps/wcm/connect/5283cc80470e3178838dd7b2572104ea/Sustainable+Plantation+Wood+Supply+2010.pdf?MOD=AJPERES</p> <p>http://www.sinarmasforestry.com/community_programmes_involvement.asp</p>
<p>Tropical Landscapes Finance Facility (TLFF) Project lead: ADM Capital Foundation</p>	<p>https://tlffindonesia.org/</p>
<p>PES Jungle Rubber Project lead: ICRAF/ World Agroforestry Centre</p>	<p>Villamor, G. and van Noordwijk, M. (2011). Social Role-Play Games Vs Individual Perceptions of Conservation and PES Agreements for Maintaining Rubber Agroforests in Jambi (Sumatra), Indonesia. <i>Ecology and Society</i>, 16(3).</p>
<p>Hutan Kemasyarakatan Project lead: ICRAF/ World Agroforestry Centre</p>	<p>http://blog.worldagroforestry.org/index.php/2017/06/15/people-matter-peat/</p>
<p>RSPO Certified Smallholders Project lead: Yayasan Setara</p>	<p>https://www.rspo.org/members/2201/Gapoktan-Tanjung-Sehati</p>
<p>Produce-Protect Criteria Project lead: M&S and Unilever</p>	<p>http://tfa2020.org/wp-content/uploads/2015/12/01122015-__Produce-Protect-CGF-statement.pdf</p>
<p>Blockchain for Palm Oil Project lead: The Technology Innovation Lab</p>	<p>http://www.worldbank.org/en/about/corporate-procurement/business-opportunities/administrative-procurement/distributed-ledger-technology-or-blockchain-services</p>

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