TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

TRADE Hub Indonesia Scoping Studies

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The UK Research and Innovation Global Challenges Research Fund (UKRI GCRF) Trade, Development and the Environment Hub is working with over 50 partner organisations from 15 different countries. The project aims to make sustainable trade a positive force in the world by focusing on the impact of the trade of specific goods and seeking solutions to these impacts.

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Executive Summary

The TRADE Hub Indonesia project is focusing on trade in oil palm and coffee, which are both important agricultural commodities for Indonesia, as well as on trade in certain wildlife species. The palm oil industry is one of the leading sectors supporting Indonesia's economic growth, particularly in advancing rural economies. However, challenges to achieving sustainable trade persist, especially in regard to reconciling socioeconomic development with environmental externalities. In recent times, palm oil producers and consumers have become increasingly concerned with issues surrounding the trade-offs and impacts of trade and commodity development. These include challenges and opportunities for improving sustainable production and maintaining or enhancing benefits while reducing trade-offs and externalities. Coffee faces similar challenges, including legality and sustainable trade issues, expansion into the forest estate, and smallholder livelihoods.

The main goal of TRADE Hub activities in Indonesia is to address trade-offs in the global trading of palm oil and coffee. The project is expected to deliver benefits for the country whilst reducing adverse impacts on high-risk forested landscapes and rural communities. It is also expected to enhance information relating to both legal and illegal wildlife trading in Indonesia, particularly for the most commonly exported species. Understanding relevant actors, power relations, and benefit sharing in the context of trade may help in addressing illegal trade issues and contributing to efforts for sustainable trade.

To ensure project activities contribute to this goal, it was essential to understand existing conditions surrounding the three study commodities, so the Indonesia TRADE Hub team conducted a scoping study accordingly. In Indonesia, a scoping study was conducted for each of the project's work packages to understand prevailing conditions and identify research gaps. Comprehensive scoping analyses and feedback provided the basis for the project to move forward. The aim of the scoping study was to map baseline information and data critical for project implementation and achieving greater outcomes and impacts. This report presents scoping study findings on palm oil, coffee, and wildlife trading in Indonesia.

Work Package 1

Work Package 1 (WP1) focuses on legal and illegal wildlife trading. For now, information is limited to the trade of songbirds in Indonesia, but we will also focus on the gecko and wild meat trades, as until now information on these has been lacking. By assessing the online marketplace, we expect to provide on-the-ground insights beyond currently available statistics. Songbirds are the most traded and popular species in Indonesia's online markets. From a total of 12,678 online advertisements, we found 10,743 related to the songbird trade. Around 10,810 birds from 141 species, 46 families, and 11 orders were advertised during the period from 22 August to 21 September 2019. The most frequently advertised orders were *Passeriformes* and *Psittaciformes.* Looking more specifically, we found the most frequently advertised species were lovebirds (*Agapornis spp.*), white-rumped shamas (*Copsychus malabaricus*), island canaries (*Serinus canaria*), zebra doves (*Geopelia striata*), and oriental magpie-robins (*Copsychus saularis*). These five most frequently advertised species represented approximately 70% of all individuals. We recorded conservation status for later selection of case studies and research activities.

Work Package 2

WP2 in TRADE Hub Indonesia focuses on oil palm and coffee, the two main agricultural commodities in this study.

Palm oil

Indonesia is the world's largest palm oil producer. Demand for palm oil drives massive expansion of oil palm plantations in Indonesia, and trade-offs are unavoidable (Pirard et al. 2017). One of TRADE Hub Indonesia's main goals is to address trade-offs between economic development and the environment in Indonesia. Following this goal, it was necessary to understand the impacts of oil palm development on forested landscapes and the important actors involved in the governance of this commodity. We found links between oil palm and deforestation, where an estimated 450,000 hectares are converted annually for oil palm plantations (Austin et al., 2017). Approximately one third of this area is forest estate. As domestic and global demand for palm oil continues to grow, threats to the remaining forest will increase further. Evidence on biodiversity loss and decline, potential human-wildlife conflicts, and threats to food security are well documented in the body of literature.

The palm oil value chain in Indonesia is complex (Pacheco et al. 2017). A study by Purnomo et al. (2018) revealed that the most powerful actors in the palm oil value chain are refinery owners, mill owners, and oil palm developers, who secure the highest distribution of added value, and the ability to determine standards and procedures for upstream to downstream palm oil trading. Meanwhile, smallholder growers are the weakest actors in the value chain in terms of the distribution of added value and power, and as such are the most vulnerable group. A major challenge for smallholders is securing sustainability certification. This is due to their lack of capacity and resources, and the legality requirements needed to comply with standards.

We identified 35 actors from 10 different groups relevant to oil palm governance in Indonesia. An analysis of power relations revealed the private sector, the Indonesian Palm Oil Association (GAPKI), national government ministries: the Ministry of Agriculture (MoA), Ministry of Environment and Forestry (MoEF), and Ministry of Agrarian Affairs and Spatial Planning (BPN), and subnational governments to be the most powerful actors. A network analysis mapped the links between various actors in oil palm governance in Indonesia. Four participating actors: MoA, GAPKI, the Ministry of National Development Planning (BAPPENAS), and the Indonesian Sustainable Palm Oil (ISPO) Commission were identified as key actors. These key actors have competing interests in development and conservation, which make efforts to strive for sustainability more challenging.

Coffee

Coffee production is the principal driver of recent deforestation in some parts of Indonesia, particularly in Bukit Barisan Selatan National Park (BBSNP) in southern Sumatra (O'Brien and Kinnaird, 2003; Gaveau *et al.*, 2009) . The expansion of coffee plantations is a major threat to the habitats of key species, including the Sumatran tiger, elephant and Sumatran rhino. This situation is exacerbated by coffee's vulnerability to climate change, which is forcing growers to establish new coffee plantations in upland regions. This leads to increased land-use change risks with associated implications for biodiversity and ecosystem services. In Lampung province, coffee is the second largest export commodity. Approximately 20,000 of Lampung's 285,000 tons of Robusta was sourced from illegal cultivation areas in BBSNP. Around 40% of the coffee growing illegally inside BBSNP was planted between 1990 and 2000 (Gaveau *et al.*, 2009). Around 44% of farmers with coffee plantations in the forest live in villages around BBSNP, while 56% are outsiders who come

from various regions to grow coffee there. On average, each farmer has 1-2 hectares of land designated for coffee production.

We mapped the supply chain and relevant stakeholders involved in the coffee sector using BBSNP and southern Sumatra as our case study region. The stakeholder mapping exercise revealed the supply chain to be complex and opaque. There are multiple levels of traders and trading companies, all engaged in the buying, selling, processing and movement of coffee. Coffee grown illegally inside the national park enters a complex supply chain early on and contaminates all subsequent stages of the supply chain, making full traceability and tracking of illegal coffee extremely challenging.

Various sustainability efforts have been conducted; in 2014, around 7,000 tons of certified coffee was produced in West Lampung. This was approximately 14% of the district's total Robusta production (West Lampung Central Statistics Agency (BPS) 2015). There is little known evidence on the effectiveness of different schemes in reducing the environmental impacts of coffee production.

Work Package 3

Social impacts of agricultural and wildlife trading are the focus of WP3. During the scoping study, the WP3 team conduct literature review on socioeconomic impacts following systematic protocol from WP3 global with adaptation to the need of Indonesia hub. The scoping aims to identify what possible intervention needs to be done within TRADE Hub Activities to deliver better change for sustainable trade. We reviewed 41 relevant articles from 209 collected articles from using ISI Web Knowledge's database. In addition, we reviewed 10 selected non-journal articles published by CIFOR. Results revealed both positive and negative socioeconomic impacts of oil palm development for rural community. It indicated that oil palm development benefiting the rural community's livelihood in many ways, especially in terms of improved/gained household income and access. It also suggested that various externalities of oil palm development related to the rural community such as conflicts (mostly due to violation community right or land dispute between the company and local or indigenous community, and dispute between company versus workers due to violation of worker's right), and raising inequality due to unfair benefit sharing among stakeholders. We identified that independent smallholders as important target from direct stakeholder for WP3 interventions. We also found that three main barriers for smallholders to implement sustainable trade that need to be addressed are technical barrier (how to maintain yield and productivity), access to finance and compliance to sustainable standard. Results of the review may become the reference to support activities design within WP3 in Indonesia.

Work Package 4

WP4 focuses on agricultural and wildlife trade policies in Indonesia, specifically on the roles traded commodities play for forested landscapes and rural communities. One part of the ongoing study is the development of a conceptual framework that frames plausible drivers through which palm oil trading is defined, and their possible relations to resulting trade outcomes. The four categories of palm oil trading drivers include: endowment, markets, institutions, and trade policies. Trade outcomes are framed through six typologies: economic growth, job creation, poverty alleviation and prevention, income, food security, and sustainability, which includes deforestation, biodiversity, and environmental issues. These aforementioned typologies are critical to strike a balance between social-economic and biophysical matters to enable a unified assessment of trade, development and the environment, as TRADE Hub seeks to achieve. In terms of relevance, these matter to countries producing palm oil which at the same time are largely forested. Current research

on palm oil usually portrays the oil palm sector as either damaging or beneficial for the environment and rural livelihoods, but rarely looks at the complexity and the dynamics of the oil palm sector comprehensively from a broad scope (Hospes et al. 2017). Research trends, mainly on the sustainability of palm oil production, have risen to an imbalance in palm oil research that is not comprehensive and is often unclear (Hansen 2015). In regard to wildlife trading, we found three trade chains: legal, quasi-legal, and illegal. These chains involve various actors who will contribute to defining stakeholder roles and economic impacts in trade policies. Reviews of legal instruments show international and domestic wildlife trading is perceived to be well regulated in Indonesia. The Government of Indonesia (GoI) has carried out many law enforcement efforts, including its establishment in 2014 of a specialized Directorate General under MoEF, i.e. the Directorate General of Law Enforcement. However, illegal trading and trafficking continue to occur. Legal reforms, capacity strengthening, improved intergovernmental collaboration, and legal and regulatory awareness are all critical to addressing existing issues.

Work Package 5

WP5 focuses on land use models that can support trade modelling activities within TRADE Hub Indonesia. The Indonesia team reviewed various trade models it expected to be useful, and decided on four types of land-use modelling: 1) Land Use Change Driver Modelling (LUDM); 2) Land Use Change Scenario Modelling (LUSM); 3) Land-Based Development Scenario Modelling for Decision Support (LDDS); and 4) Land-Based Development Scenario Modelling for Negotiation Support (LDNS). We are reviewing Dinamica EGO as an example of LUDM; FALLOW and InVEST as examples of LUSM; GLOBIOM and system dynamics models as examples of LDDS; and LUMENS, developed by ICRAF, as an example of LDNS. The latest modelling type is land-use development modelling for decision and negotiation support, which will be useful for developing policy scenarios for policy makers. The Indonesia team has experience in developing and utilizing land-use modelling, which it will develop based on the sustainable agriculture and wildlife commodity trade business scenarios recommended by later findings of TRADE Hub Indonesia.

Work Package 6

WP6 focuses on studying private sector solutions and impacts. The scoping work has reviewed the various commitments, initiatives and standards of private sector operators in Indonesia. It also follows the typology and characteristics of the main private initiatives to promote zero deforestation by Lambin et al. (2018). In the review, these initiatives are grouped into four types: 1) collective aspirations towards minimizing biodiversity impacts and social impacts, such as the Consumer Goods Forum and One Planet Business for Biodiversity (OP2B); 2) certification schemes for sustainable palm oil, such as the Roundtable on Sustainable Palm Oil (RSPO); 3) company pledges towards minimizing biodiversity impacts and social impacts, such as sustainable palm oil manifestos and sustainable policies by corporate groups or individual companies; and lastly 4) adoption of codes of conduct by corporate groups or individual companies, such as Unilever and Nestle. A general assessment of efficiency and challenges was identified as a part of the scoping study. We found different degrees of success for effective implementation and adoption of standards and translation of commitments into expected outputs and outcomes. However, various challenges hamper the effective realization of commitments. Among other things, these include a lack of coherent legal frameworks, transparency and incentives.

Work Package 7

WP7 focuses on the oil palm sector, specifically on identifying existing Indonesian public sector initiatives and approaches on minimizing biodiversity, zero habitat loss, and

preventing harm to local people in connection with globally traded commodities. The findings show that GoI has committed to supporting the implementation of international conventions, as reflected by the promulgation of relevant laws. Major laws and regulations on oil palm plantations and ISPO are already in place. Over the last two years, President Jokowi has issued three different presidential instructions to improve forest and peatland governance, protect natural forests and peatlands, prevent deforestation and land degradation, improve crop productivity, and accelerate efforts to promote and attain the country's sustainable palm oil targets. These presidential instructions also specify key actors and necessary programs. In addition, GoI has led many initiatives including essential ecosystem areas or *Kawasan Ekosistem Esensial* (KEE), and protection of high conservation value (HCV) forests. Despite government-led initiatives, most efforts to protect HCV and high carbon stock areas are still driven by markets and voluntary certification.

Work Package 8

Various web-based trade platforms have been reviewed through big data analyses in the scoping paper for WP8, and analysis results will provide important guidelines for further TRADE Hub activities. Web addresses, developers, donors, data providers, data sources, types of spatial coverage, and commodity data availability are included in a database of these platforms. Twenty-nine platforms were selected for the review. Around 97% of the platforms provided data and/or visualization on international trade for more than one country; 93% of platforms contained data and or visualization of Indonesian trade, while data on coffee and palm oil were found in 79% and 90% of platforms respectively. However, data for wildlife was only available in 31% of platforms. There were 159 actors involved across the 29 platforms. These consisted or organizations (95%) and individuals (5%) playing different roles from developers and data providers, to financiers. A single actor might be engaged in more than one platform or play more than one role in a single platform as well as across multiple platforms. Approximately 41% or 65 actors were data providers, 30% were developers, and 14% were financiers. A social network analysis recommends potential data providers and developers to work with in future studies.

Work Package 9

WP9 focusses on capacity building for internal and external actors or team members. In the scoping study, we identified key actors and key networks for targeted stakeholders in WP9 activities. Capacity building topics for internal group including multifunctionality of oil palm landscape and oil palm supply chains. In addition, various trainings of new tools and methods that are used or going to be used for Trade Hub Global can be offered to improve capacity of Trade Hub Indonesia. For external group, the scoping study resulted in four types of key institutional networks for TRADE Hub capacity building: government regulators; financial institutions; the private sector; and an NGO network. First, the government regulator with the greatest potential for engagement was the Indonesia Green Growth Program (IGGP) hosted by the Ministry of National Development Planning (BAPPENAS). Second is the financial institution network, where the Indonesia Sustainable Finance Initiative was seen as having the greatest potential for engagement. This network brings together Indonesian banks pioneering 'Sustainable Banking' to promote and implement inclusive sustainable finance practices. Third, in the private sector network, the Indonesian Palm Oil Association (GAPKI) has a central role in the palm oil industry. Lastly, the NGO network consisting of WWF was identified as the most relevant network. The WP9 team has also mapped various training activities on sustainable trade and financial investment. Based on the literature review, critical topics in the context of sustainable trade and financial investment are climate finance, green bonds, green economy, green finance, green funds, sustainable finance, sustainable investment, and sustainable practices. TRADE Hub

knowledge products that can contribute to this capacity building include: a) Connection of investment and global trade on sustainable principles in palm oil, coffee and wildlife trade; and b) financial regulatory tools, products and services in palm oil investment and trade decision making at district, provincial and national scales, which incentivize/disincentivize sustainable smallholder production.

Events and meetings

The TRADE Hub Indonesia team organized a project kick-off workshop in Jakarta on 4 March 2020, and a provincial-level workshop in West Papua province on 19 February 2020. Essentially, the aims of these workshops were to introduce TRADE Hub to key stakeholders, communicate findings, and gain perspectives, insights, contexts, and feedback on the project, framework, and findings. The Jakarta kick-off workshop involved 154 participants, while 85 participants attended the workshop in West Papua. Participants included representatives of key institutions ranging from academic/ research institutions, government, financial institutions, private sector operators and business associations. Both workshops went well and achieved their objectives. Key stakeholders in Indonesia's palm oil, coffee, and wildlife trades welcomed the project. The TRADE Hub project raised issues that aligned with key stakeholders' interests and tasks. Key stakeholders participating in both workshops were involved in discussions and provided critical input and insights.

In addition to organizing events, the TRADE Hub Indonesia team also conducted stakeholder consultations between December 2019 and February 2020. The team discussed the latest issues in sustainable trade, and informed 19 key stakeholders occupying prominent positions in central government institutions, such as at the Coordinating Ministry for Economic Affairs, the Ministry of Trade, Ministry of Environment and Forestry, the Oil Palm Plantation Fund Management Agency (BPDKS), and Ministry of Home Affairs, about the TRADE Hub research project. These key stakeholders welcomed the TRADE Hub Indonesia team and showed support for its research focus. The project is expected to contribute to science-based policy making and will continue its engagement with key stakeholders in government and other relevant institutions to ensure important actors are kept informed and invited to participate.

Contents

xi

List of figures

List of tables

List of abbreviations

ACP	: Actor-centered Power
APKASINDO	: Asosiasi Petani Kelapa Sawit Indonesia - Indonesian Palm Oil Smallholder's Association
ASPEKPIR	: Asosiasi Petani Kelapa Sawit PIR - Indonesian Palm Oil NES Smallholder's Association
BAPPENAS	: Kementerian Perencanaan Pembangunan National - Ministry of National Development Planning
BPDP KS	: Badan Pengelola Dana Perkebunan Kelapa Sawit - The Indonesian Oil Palm Estate Fund
BPN	: Kementerian Agraria dan Tata Ruang - Ministry of Agrarian Affairs and Spatial Planning
BRG	: Badan Restorasi Gambut - Peatland Restoration Agency
CIFOR	: Center for International Forestry Research
CITES	: The Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMEA	: Kementerian Koordinator bidang Perekonomian - Coordinating Ministry in Economic Affairs
CPO	: Crude Palm Oil
CPOPC	: Council of Palm Oil Producing Countries
DMSI	: Dewan Masyarakat Sawit Indonesia
DPR	: Dewan Perwakilan Rakyat - People Representative Council
FFB	: Fresh Fruit Bunch (Oil Palm)
FoKSBI	: Forum Kelapa Sawit Berkelanjutan Indonesia (Forum for Sustainable Palm Oil Indonesia)
FONAP	: Forum for Sustainable Palm Oil
GAPKI	: Gabungan Pengusaha Kelapa Sawit Indonesia - Indonesian Palm Oil Association
GAR	: Golden Agri-Resources
GDP	: Gross Domestic Product
GGGI	: Global Green Growth Initiatives
HCS	: High Carbon Stocks
HCV	: High Conservation Value
ICRAF	: World Agroforestry
IDH	: The Sustainable Trade Initiative
IFC	: International Finance Corporation
INOBU	: Yayasan Penelitian Inovasi Bumi - Foundation for Earth Innovation Research
IOPRI	: Indonesian Oil Palm Research Institute
IPB University	: Bogor Agricultural University
ISCC	: International Sustainability & Carbon Certification
ISPO	: Indonesia Sustainable Palm Oil Commision
IUCN	: International Union for Conservation of Nature
KADIN	: Kamar Dagang Indonesia - Indonesian Chamber of Commerce and Industry
MoA	: Kementerian Pertanian – Ministy of Agriculture
MoEF	: Kementerian Lingkungan Hidup dan Kehutanan - Ministry of Environment and Forestry
MoT	: Kementerian Perdagangan - Ministry of Trade
KPO	: Kernel Palm Oil

KSP   : Kantor Staf Presiden - Presidential Staff Office
LDDS   : Land-based development scenario modelling for decision support
LDNS   : Land-based development scenario modelling for negotiation support
LUDM   : Land use change driver modelling
LUSM   : Land use change scenario modelling
NES   : Nucleus-Estate Scheme (of oil palm)
NGOs   : Non-Governmental Organizations
OP2B   : One Planet Business for Biodiversity
PASPI   : Palm Oil Agribusiness Strategic Policy Institute
POIG   : Palm Oil Innovation Group
RA   : Rainforest Alliance
RCCC UI   : Research Center for Climate Change University of Indonesia
RSPO   : Roundtable on Sustainable Palm Oil
SNA   : Social Network Analysis
SPKS   : Sarikat Petani Kelapa Sawit - Association of Oil Palm Farmers
TRADE Hub   : Trade, development and the environment Hub
UNILA   : University of Lampung
USAID   : United States Agency for International Development
WALHI   : Wahana Lingkungan Hidup Indonesia - Indonesian Environmental
                Platform
WCS   : Wildlife Conservation Society
WWF   : World Wild Fund for Nature

1. Introduction

Trade-offs are inevitable when economic growth is driven by trade in agricultural commodities and wildlife species. The biodiversity and social impacts associated with trade constitute intractable challenges to implementing sustainable trade. To overcome these challenges, the Trade, Development and the Environment Hub (TRADE Hub) project will attempt to enhance the relevance and promote the uptake of our research, and support decision makers at all levels to develop and implement relevant policies and regulations.[1] Indonesia is one of the focus countries for TRADE Hub, where the main focus is on the trade in agricultural commodities (palm oil and coffee) as well as wildlife species.

Palm oil is an important agricultural trade commodity and is the second largest agricultural product for Indonesia's economy (Dermawan and Hospes 2018) after rubber.[2] Indonesia is the world's largest producer of palm oil and contributes more than 50% of global production (Sharma et al. 2018). Indonesia is also major exporter and consumer, ranking first and second respectively (Byerlee et al. 2017). Increasing demand for palm oil has resulted in massive oil palm plantation expansion in Indonesia, which delivers important economic development, but also has associated environmental and socioeconomic impacts. This expansion is driving deforestation in Borneo and a decline in orangutan populations (Meijaard et al. 2018). It causes tenurial conflicts and social exclusion of indigenous communities, and inequitable benefit sharing between actors (Sheil et al. 2009; Rist et al. 2010; Pacheco et al. 2017).

Another key agricultural commodity from Indonesia is coffee. Indonesia has been one of the leading producers of coffee for centuries, and is a significant player in the global trade (TPSA Project 2018; Neilson 2013). Indonesia's coffee production is dominated by smallholders (Arifin 2010; Ibnu 2017). Coffee farming is associated with impact on forests. In the face of climate change, the risk to coffee production in Indonesia is increasing (TPSA Project 2018; Bunn et al. 2015; Killeen and Harper 2016), and driving the threat of new coffee plantation expansion in upland regions.

Indonesia is one of the main Asian countries acting as a source and transit place for international wildlife trading (Traffic International 2008; Baker et al. 2013), and is considered a 'wildlife trade hotspot' (Nijman 2010; Traffic International 2008). The export value of trade in wild animal and plant species was estimated to be USD 374 million in 2015, increasing to USD 580 million in 2017 (MoEF 2018). Despite Indonesia applying rules and regulations to govern the trade in wildlife, illegal trading and trafficking continue to occur (Hanif 2015). The value of this illegal trade has been estimated at USD 900 million per year.[3] The real value is, however, remains unknown and could well be higher than this estimate (Lubis 2017).

Palm oil, coffee, and wildlife are critical in the context of Indonesia's trade. Increasing demand attracts more actors to become involved in value chains and incentivizes them to invest in and expand the industry. Climate change is having detrimental impacts on production volume and quality, which impacts upon farmer income and welfare (Sujatmiko and Ihsaniati 2018). Competing interests in economic development and conservation make reconciliation and sustainability efforts more challenging. The oil palm industry, for example, is one of the leading economic sectors with rural development potential. However, it has significant sustainability challenges, such as how to minimize the environmental and

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[1] UKRI GCRF Trade Hub Proposal.
[2] https://www.tribunnews.com/nasional/2019/06/26/empat-dari-sepuluh-produk-ekspor-andalan-indonesia-adalah-komoditas-pertanian
[3] http://ppid.menlhk.go.id/siaran_pers/browse/1203

socioeconomic trade-offs of plantation development, particularly its associated impacts on forest landscapes and rural communities. The main goal of the TRADE Hub project in Indonesia is to formulate recommendations and strategies for reconciling the trade-offs associated with the global trade in palm oil and coffee. In addition, the project is also expected to enhance information relating to legal and illegal wildlife trading in Indonesia, particularly for the most commonly exported species. Understanding relevant actors, power relations, and benefit sharing in the context of trade may help in addressing illegal trade issues and contributing to efforts for sustainable trade.

The Indonesia TRADE Hub team has formulated a country-level Theory of Change (Annex 1). This will constitute the guideline for developing and implementing valuable project activities that drive change. Two impact areas of TRADE Hub Indonesia are: (1) improved benefits and reduced impacts from the oil palm and coffee trades; (2) better wildlife trade governance and reducing illegal wildlife trading. These two impact areas are being explored following the Indonesia context, focusing on the trade in two agricultural commodities (palm oil and coffee), and wildlife commodities (songbirds and snakeskins) framed through six trade outcomes.

TRADE Hub activities in Indonesia commenced by improving understanding of at-risk forested landscapes and associated supply chain risks in order to guide sustainable palm oil and coffee production. Business cases will be developed for sustainable commodity production that can be demonstrated and adopted by rural communities in high-risk forested landscapes. New knowledge will be generated for decision makers to better apply sustainability principles for commodity production and trade from high-risk forested landscapes. This will involve early career researchers and professionals. The Hub will provide improved tools and products to support sustainable investment decisions in palm oil, coffee, and wildlife trade, which can be adopted by Indonesian financial regulatory authorities. The Hub will conduct value chain studies for wildlife trade. It will then engage government regulators and private enterprises to support better incorporation of sustainability information into decision making for production and trade. The Hub will improve the capacity of early career researchers and students on how global trade can deliver benefits to people and the environment.

To ensure project activities contribute to achieving goals and outcomes, it was essential to understand existing conditions surrounding the three study commodities, so the Indonesia TRADE Hub team conducted a scoping study accordingly. A scoping study was conducted for each of the project's work packages in order to understand the prevailing status, identify research gaps, and provide important feedback for the global project. The aim of the scoping study was to map baseline information critical for project implementation to achieve greater outcomes and impacts. This report provides findings from the scoping study for each of the work packages. We hope it can provide a fundamental understanding of the palm oil, coffee and wildlife trades in Indonesia.

2. Summary of topics and methodologies

A scoping study was conducted for each of the work packages, Table 1 shows a summary of topics, key scoping questions, and methodologies utilized for each work package.

Table 1. Summary of scoping study topics, key scoping questions, and methodologies for each work package.

Work Package	Topics	Key scoping questions	Methodology	Co-Author
WP1 Wild species in trade	Songbird trade in Indonesia.	What is the most traded songbird in Indonesia, especially for domestic trade?	Big data analysis (web data extraction of the online marketplace)	CIFOR 1. Beni Okarda 2. Ahmad Dermawan 3. Usman Muchlish
WP2 Domesticated species in trade	Overview of oil palm and coffee in Indonesia.	What is the link between oil palm development with deforestation and forest degradation? What is the biodiversity impact of oil palm and coffee development? Stakeholder mapping	Oil palm 1. Literature review 2. Actor-centred power 3. Social Network Analysis Coffee 1. Literature review	Oil palm by CIFOR 1. Herry Purnomo 2. Sonya Dyah 3. Ahmad Dermawan Coffee by WCS and UNILA team
WP3 Social impacts	Socio-economics impact of oil palm trade in Indonesia.	1. What are the identified well-being impacts? (Focus on poverty in terms of money (income/expenditure, SDG1), global Multi-dimensional poverty index (MPI), food security/nutrition, and health. The global MPI includes living conditions, health (including food issues), and education.) 2. What are the wider social-economic impacts? 3. How do these impacts differ across supply chain actors? 4. What are the main drivers of change in these effects on well-being/poverty? 5. What scenarios of change towards sustainable trade do TRADE Hub want to look at?	A literature review based on protocol from WP3 at global level.	1. Agus Andrianto (CIFOR) 2. Sonya Dyah Kusumadewi (CIFOR) 3. Herry Purnomo (CIFOR)
WP4 Trade policies and economics impacts	1. Palm oil trade policy. 2. Wildlife trade chains.	1. What are the existing trade policies of palm oil and coffee in Indonesia? 2. What are the existing wildlife trade chains in Indonesia?	1. Systematic review 2. Literature review	Sonny Mumbunan (RCCC UI)
WP5 Modelling trade scenarios	Land-use modelling to support policy scenarios for rural	What is the available land-use modelling tools and their uses?	Review of existing modelling tools	1. Sonya Dewi (ICRAF) 2. Betha Lusiana (ICRAF) 3. Tania Benita (ICRAF)

Work Package	Topics	Key scoping questions	Methodology	Co-Author
	development at the national and sub-national levels in Indonesia.			4. Harry Aksomo (ICRAF)
WP6 Private sector solutions and impact	Platforms, initiatives, and policies led by the private sector aimed to prevent and mitigate biodiversity and habitat losses.	1. What are existing platforms, initiatives and policies led by the private sector that aim to prevent and mitigate biodiversity and habitat losses? 2. To what extent are issues around the protection of wildlife and illegal trade addressed by private sector initiatives and policies?	Literature review including publication and document review from existing research at CIFOR	1. Heru Komarudin (CIFOR) 2. Michael Brady (CIFOR)
WP7 Public sector solutions and impact	Major policies and regulations governing natural resource management, biodiversity conservation, environment associated with forests, oil palm, and coffee plantations, and wildlife.	1. What is the state of knowledge of existing public sector initiatives and approaches towards minimizing biodiversity loss, zero habitat loss, and preventing harm to local people in connection to global trade?	Literature and document review	Heru Komarudin (CIFOR)
WP8 Innovation, technology, and outreach	Trade database and/or visualizations.	1. What are the existing tools and web platforms, and who are the potential partners?	Big data mining and analysis.	1. Herry Purnomo (CIFOR) 2. Dyah Puspitaloka (CIFOR) 3. Andree Ekadinata (ICRAF)
WP9 Capacity building	Capacity building for sustainable investment decisions.	1. What is the existing institutional network related to the capacity building of sustainable investment decisions? 2. What are the capacity building needs of government regulators, private enterprises and financial regulators in Indonesia in order to include sustainability criteria in investment and trade decision making?	Literature review and internal discussions.	1. Suria Darma Tarigan (IPB University) 2. Iskandar Siregar (IPB University) 3. Miftah Rahman (IPB University) 4. Ken Dara Cita (IPB University)

3.   Key findings

This chapter elaborates on the scoping work for each WP. More detailed reports for each WP are available in the annexes.

3.1. Work package 1 – Wild species in trade

3.1.1. Rationale

During 2015-2017, birds were the most traded wildlife species from Indonesia (MoEF 2018). The CITES database recorded export volumes of birds from Indonesia, which have tended to increase over the last three years.[1] In addition to international demand, a cultural heritage of bird keeping and songbird competitions in Indonesia has contributed to the country's active bird trade (Jepson et al. 2011; Harris et al. 2017). Consequently, the study selected birds as the focus species group in TRADE Hub research activities. The scoping study was carried out to further understand the bird trade in Indonesia, with its results expected to guide the selection of focus species for the case study.

3.1.2. Methodology

We monitored and assessed online songbird trading. A study by Morgan and Chng (2018) suggested that with Internet use now entering the mainstream in Indonesia, it has become relatively easy to sell various wildlife species, including protected ones. Consequently, monitoring and assessment of the online songbird trade in Indonesia was critical to provide insights for TRADE Hub activities focusing on both legal and illegal wildlife trading. A web-based big data extraction was conducted by targeting OLX, a well-known online marketplace in Indonesia. OLX was selected because it is one of the largest online marketplaces in the country, and its data is open and could be extracted using available tools. We used Web Scraper, an open-source Google Chrome extension tool for web data extraction. We also used the pre-processing tools Stop Word NLTK and N-gram modules to support the process. Annex 2 provides a description of the methods used.

3.1.3. Findings

- From a total of 12,678 online advertisements, we found 10,743 related to the songbird trade. Around 10,810 birds from 141 species, 46 families, and 11 orders were advertised during the period from 22 August to 21 September 2019.
- Our findings confirm TRAFFIC's snapshot surveys in key bird markets stating that around 86,000 birds were traded in Indonesia, Malaysia, Singapore, Thailand, and Vietnam in 2014-2018 (TRAFFIC 2019).
- The most frequently advertised orders were *Passeriformes* and *Psittaciformes*.
- The most frequently advertised species were lovebirds (*Agapornis spp.*), white-rumped shamas (*Copsychus malabaricus*), island canaries (*Serinus canaria*), zebra doves (*Geopelia striata*), and oriental magpie-robins (*Copsychus saularis*). These five most frequently advertised species represented approximately 70% of all individuals.
- The wild bird trade, according to Rentschlar et al. (2018), has been a major driver of species loss in Indonesia. In the past it was driven by the tradition of bird keeping in Java. Now, the demand for songbirds is rising throughout the country.[2]

- Lovebirds, white-rumped shamas, island canaries, and oriental magpie-robins are used most frequently for songbird competitions, while zebra doves have close ties to the Javanese tradition of bird keeping.
- Even though advertisements came from 163 districts and 24 provinces, almost 90% of them were from Java. The bird trade does occur elsewhere in Indonesia where Kalimantan, for example, has a significant trade. By extrapolation, this may occur in other areas as well (Rentschlar et al. 2018).
- Total offering prices averaged approximately USD 23,000 daily, with a minimum total of USD 14,000 and a maximum total of USD 47,000.
- There were 687 individuals from 29 species included in the IUCN Red List being advertised, and 201 individuals from 17 species included in the protected species list in Minister of Environment and Forestry Regulation No. 106/2018.

3.2. Work package 2 – Domesticated species in trade

3.2.1. Palm Oil

3.2.1.1. Rationale

Indonesia is the world's largest palm oil producer, demand for palm oil drives massive expansion of oil palm plantations in the country. Despite delivering notable economic development impacts (Pacheco et al. 2017), oil palm expansion in Indonesia has associated environmental impacts, relating particularly to deforestation and biodiversity loss (Kissinger, Herold and Sy 2012; Dislich et al. 2017; Gaveau et al. 2018; Meijaard et al. 2018). Trade-offs between economic development and environmental conservation in the oil palm sector of Indonesia are unavoidable (Pirard et al. 2017; Purnomo et al. 2020). One of TRADE Hub Indonesia's main goals is to address the economic development and environmental trade-offs in Indonesia's palm oil trade. Therefore, as a starting point for achieving this goal, it was necessary to understand the key problems with and impacts of oil palm development. The scoping study for oil palm in the context of WP2 began by understanding its impacts by reviewing links between oil palm development, deforestation and biodiversity loss in Indonesia.

As the oil palm sector is well established in Indonesia, an understanding of existing oil palm governance was key information for TRADE Hub. Governance is generally defined as being how policies and decisions are made and implemented, where a wide variety of actors with different purposes and objectives sustain coordination and coherence (Purnomo et al. 2018). To gain a better understanding of oil palm governance, we conducted stakeholder mapping along with a power analysis. The key to achieving good governance is maintaining the relative power balance between actors (Purnomo et al. 2018), so a power analysis was useful for determining those actors with the greatest potential to improve governance (Krott et al. 2014). In addition, to better understand the interactions between actors in oil palm governance, we conducted a Social Network Analysis (SNA) focusing on inter-actor relations (Hanneman and Riddle 2005).

3.2.1.2. Methodology

There were two main objectives in the oil palm scoping study under WP2: first, to understand the links between oil palm development, deforestation and biodiversity loss; and, second, to determine those actors supporting economic development or environmental conservation for sustainable oil palm governance. To achieve the first objective, we carried out a literature review, while second objective involved conducting a power analysis using an Actor-Centered Power (ACP) approach (Krott et al. 2014) and a Social Network Analysis

(Hanneman and Riddle 2005) using Kumu software. These methodologies are detailed in Annex 3 and 4 of the complete report.

3.2.1.3. Findings

Links between oil palm development, deforestation and biodiversity loss

- As tree cover has been lost at an unprecedented pace, there has been a disproportionate loss of forest-dependent species. Regions with high values for biodiversity significance show intermediate levels of loss across large regions of the forests of continental and insular Southeast Asia (Hill et al. 2019).

- Palm oil expansion has long been associated with forest loss in Indonesia. Sumatra and Kalimantan are the regions where most expansion of oil palm plantations has occurred since the 1990s. Since 2010, expansion has also been taking place in Papua. These regions are where most of Indonesia's remaining forest is located. Despite slowing expansion due to various sustainability policies and initiatives, the risk of forest conversion for oil palm development remains in these regions due to the growing demand for palm oil.

- Various studies suggest the conversion of forests for oil palm plantations causes biodiversity loss due to altered or lost habitats, the removal of species deemed to be pests, and direct loss due to burning for plantation development. Species populations and densities are declining in most taxonomic groups in oil palm plantations compared to forests. Forest conversion to oil palm also leads to increased human-wildlife interactions and threats to food security, especially for forest-dependent communities.

- Oil palm development in Indonesia is driven by both international and domestic demand, and its expansion under various pressures is expected to continue in Indonesia following international and domestic demand.

- Since 2009, oil palm expansion has occurred with smallholder-managed plantations developed through various management schemes, and by private companies through their concessions. Studies have reported both smallholders and private companies to be agents for forest conversion to oil palm plantations.

- Oil palm plantations in Indonesia cover approximately 14 million hectares, with an expansion rate of around 450,000 hectares annually, around one third of which is into the forest estate.

- The status of oil palm plantations as the main driver of deforestation in Indonesia is changing. Studies suggest huge number of forests in Indonesia are being converted into oil palm plantations; however, findings show that most new plantations are being developed in non-forested areas (cleared or degraded lands).

Value chain analysis of palm oil in Indonesia

- The palm oil value chain in Indonesia is complex. There are three main upstream actors in oil palm plantations: smallholders, private companies, and state-owned companies. A study by Pacheco et al. (2017) identified business models determined by land access (companies as landholders, or local people as landholders), and smallholder roles (nucleus-plasma systems, joint-venture systems or independent growers). Generally, there are four oil palm plantation business models (Pacheco et al. 2017):

  1. Medium and large-scale estates managed by companies;

2. Nucleus estate and smallholder schemes (NES) involving companies as landholders and corporate farmers as out-growers;
3. Joint-venture schemes (*Kemitraan)* involving companies as plantation managers and locals as landholders; and
4. Independent medium- and small-scale smallholders.

- According to Indonesian regulations, companies are allowed to establish integrated mills with a minimum 1,000-ha planted area with mature palms. Meanwhile, independent mills can be established if fresh fruit bunches (FFBs) are sourced from independent growers.

- Once FFBs are milled, the resulting crude palm oil (CPO) is transported to a refinery to produce refined palm oil as the industry raw material. Much of the processing and refining takes place in Indonesia, Malaysia, and Singapore, while most manufacturing takes place in consumer countries, particularly China. Palm oil uptake is highly fragmented between various types of consumer goods industries. Figure 1 shows a simplified value chain for palm oil in Indonesia (Pacheco et al. 2017).
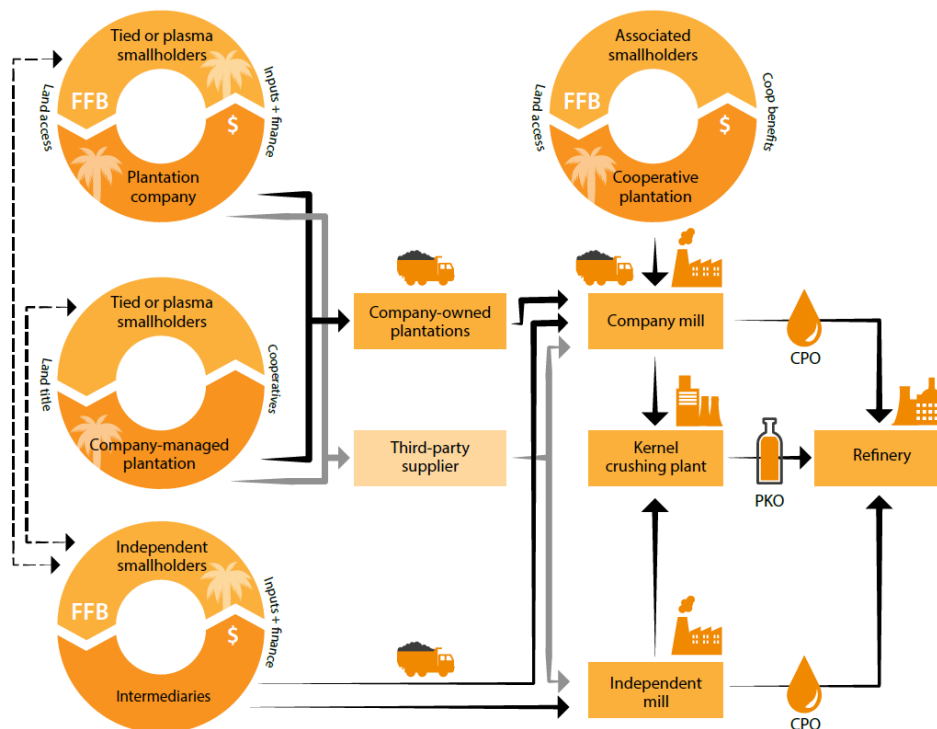
Figure 1. Simplified value chain for palm oil in Indonesia (Pacheco et al. 2017).

- A study by Purnomo et al. (2018) revealed the most powerful actors in the oil palm value chain to be refinery owners, mill owners, and oil palm developers, who secure the highest distributions of added value and have the ability to determine standards and procedures for upstream to downstream palm oil trading. Meanwhile, smallholder growers are the weakest actors in the value chain in terms of the distribution of added value and power. Intermediaries play important roles in supply chains from small- or medium-scale independent smallholders, where farmers lack their own transportation, and the economy of scale and capacity to sell directly to palm oil mills.

8

- Smallholders are important, but also the most vulnerable group of actors in Indonesia's oil palm sector. There are various types of smallholders due to the heterogeneous character of business models that differ significantly across landscapes. Smallholder typologies are characterized by their land ownership, decision making, negotiation power, share in production and price risk, and share in costs and benefits. Generally, Indonesian smallholders are classified either as independent or tied smallholders. Independent smallholders are farmers without fixed contracts with any companies or mills, whereas tied smallholders are linked to private or state-owned companies through various partnership schemes, such as NES, out-grower, or joint venture schemes.

- Different types of smallholders face different opportunities and challenges. Tied smallholders are incentivized through benefits such as reduced transaction costs, market access for increased productivity, formalized land tenure, and improved access to funding, and other forms of capital, such as better planting materials and technical knowledge. On the other hand, they have less freedom in decision making, and in some cases report a lack of transparency in contractual agreements and unequal benefit sharing. Although independent smallholders have more freedom in managing their plantations, challenges include less or limited institutional, technical and financial support; lack of knowledge on best practices and technologies; and no access to good planting materials. Independent smallholders have significantly lower yields, and limited access to markets. They are also highly dependent on local traders or local mills to sell their FFBs. Consequently, independent smallholders are the most economically vulnerable actors in value chains. Evidence shows that tied farmers tend to generate better incomes than independent smallholders. This is likely due to company support improving their capacity and resources through technical assistance.

- Another challenge for smallholders is achieving the compliance necessary for securing sustainability certification. Smallholders lack the technical capacity and/or financial resources to comply with standards, and legality issues relating to compliance have become a significant challenge.

Initiatives for sustainable oil palm in Indonesia
- Various public and private sector initiatives have been implemented in Indonesia to reduce impacts on forests and biodiversity. Although standards and certification schemes have had little impact on reducing forest loss in peatlands or on active fire detection rates, they have lowered deforestation (Carlson *et al.*, 2018). Sustainability regulations and policies in Indonesia are often conflicting and suffer from very weak or slow implementation on the ground. This has become major barrier in Indonesia, with no clear strategy on how existing environmental policies will align with, or can support the country's development goals.

Actor analysis for oil palm governance in Indonesia
- More than thirty-five relevant actors from 10 different groups have been identified in Indonesia's oil palm chain of governance (Daemeter Consulting 2015; Pacheco et al. 2017; Pirard et al. 2017; Purnomo et al. 2018; Setiawan et al. 2016). These actors are as follows:
  1. National government agencies
     - The President (through the Presidential Staff Office/KSP),
     - The Ministry of National Development Planning (BAPPENAS),
     - The Ministry of Agriculture (MoA)
     - The Ministry of Environment and Forestry (MoEF)

- The Coordinating Ministry for Economic Affairs (CMEA)
- The Ministry of Finance (MoF)
- The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (BPN)
- The Ministry of Trade (MoT)
- The National Parliament (DPR)
- The Oil Palm Plantation Fund Management Agency (BPBDKS)
- The Peatland Restoration Agency (BRG),
- The Indonesian Sustainable Palm Oil Commission (ISPO);

2. Local governments
   - District governments
   - Provincial governments;

3. The private sector
   - The Indonesian Palm Oil Association (GAPKI),
   - The Indonesian Biofuel Producers Association (APROBI),
   - The Indonesian Chamber of Commerce and Industry (KADIN);

4. Farmers
   - The Union of Oil Palm Farmers (SPKS)
   - The Indonesian Palm Oil Smallholders' Association (APKASINDO),
   - The Indonesian NES Oil Palm Farmers' Association (ASPEKPIR);

5. Academia such as
   - IPB University;

6. Research organizations and thinktanks
   - The Palm Oil Agribusiness Strategic Policy Institute (PASPI),
   - The Indonesian Oil Palm Research Institute (IOPRI);

7. Industry associations/roundtables
   - The Indonesian Palm Oil Council (DMSI),
   - The Roundtable on Sustainable Palm Oil (RSPO);

8. Intergovernmental organizations
   - The Council of Palm Oil Producing Countries (CPOPC),
   - The Global Green Growth Institute (GGGI);

9. Non-governmental organization (NGOs)
   - The Sustainable Trade Initiative (IDH),
   - World Wild Fund for Nature (WWF),
   - Yayasan Penelitian Inovasi Bumi - Foundation for Earth Innovation Research (INOBU),
   - Daemeter Consulting,
   - Yayasan Kehati,
   - Greenpeace,
   - Wahana Lingkungan Hidup Indonesia - Indonesian Environmental Platform (WALHI);

10. International organizations and donor agencies such as

o IFC,
o USAID.

- Based on an analysis of interests, actors are perceived to have different interests in the economic development and environmental conservation aspects of sustainable palm oil. We also found some actors to be neutral. Table 2 provides an illustration of actor interest groups.

Table 2. Actor interest groups in sustainable oil palm governance in Indonesia.

Interest Group 1 – Economic Development		Interest Group 2 – Environmental Conservation		Interest Group 3 – Neutral
Actor	Level of interest	Actor	Level of interest	Actor
BAPPENAS	High	MoEF	High	President
MoA	High	BRG	High	DPR
CMEA	High	RSPO	High	ISPO
MoF	High	WWF	High	Academia
MoT	High	Greenpeace	High	GGGI
BPDP KS	High	WALHI	High	IDH
District governments	High			INOBU
Provincial governments	High			Daemeter
Private sector associations	High			Yayasan Kehati
Farmer associations	High			International organizations and donor agencies
IOPRI	High			
CPOPC	High			
DMSI	High			
PASPI	Moderate			

See abbreviation below[3]

- A power relations analysis using ACP identified the most powerful actors in oil palm governance to be the private sector (GAPKI); national government ministries, the Ministry of Agriculture (MoA), Ministry of Environment and Forestry (MoEF), and Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (BPN); and local governments at both provincial and district levels. A few corporations lead the oil palm sector, especially in processing and trade. These are Golden Agri International group

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[3] Abbreviations: **BAPPENAS**: The Ministry of National Development Planning; **MoA**: The Ministry of Agriculture; **MoF** (The Ministry of Environment and Forestry); **CMEA**: The Coordinating Ministry for Economic Affairs; **MoF**: The Ministry of Finance; **BPN**: The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency; **MoT**: Ministry of Trade; **DPR**: The National Parliament; **BPDPKS**: The Oil Palm Plantation Fund Management Agency; **BRG:** The Peatland Restoration Agency; **ISPO**: The Indonesian Sustainable Palm Oil Commission; **GAPKI**: The Indonesian Palm Oil Association; **APROBI**: The Indonesian Biofuel Producers Association; **KADIN**: The Indonesian Chamber of Commerce and Industry; **SPKS**: The Union of Oil Palm Farmers; **APKASINDO**: The Indonesian Palm Oil Smallholders' Association; **ASPEKPIR:** The Indonesian NES Oil Palm Farmers' Association; **IPB University:** Bogor Agricultural University; **PASPI**: The Palm Oil Agribusiness Strategic Policy Institute; **IOPRI**: The Indonesian Oil Palm Research Institute; **DMSI**: The Indonesian Palm Oil Council; **RSPO**: The Roundtable on Sustainable Palm Oil; **CPOPC**: The Council of Palm Oil Producing Countries; **GGGI**: The Global Green Growth Institute; **IDH:** The Sustainable Trade Initiatives; **WWF**: World Wild Fund for Nature; **INOBU**: Yayasan Penelitian Inovasi Bumi - Foundation for Earth Innovation Research, **WALHI**: Wahana Lingkungan Hidup Indonesia - Indonesian Environmental Platform.

(GAR), AAA Oils and Fats (PT Sari Dumai Sejati), Intercontinental Oil and Fats (Musim Mas) and the Wilmar Group.[4]

- Among the three most powerful national government ministries, the Ministry of Agriculture is the only one with a direct role in palm oil policy making and implementation in Indonesia. Nevertheless, the other two have important roles in licensing processes. Local governments play an important role in oil palm plantation licensing processes at the local level.

- Results of the Social Network Analysis of actors in oil palm governance chains based on degree of centrality, closeness centrality (eigenvector), and betweenness centrality are shown by Table 3. Degree of centrality value explains how many ties that actor has (Hauck, Schmidt and Werner 2016). Closeness centrality interprets the accessibility of an actor, and Eigenvector measures are useful in finding the most central actors. Betweenness shows which actors connect most often with others in the network (Hanneman and Riddle 2005). The various oil palm governance actors in Indonesia were connected to each other according to the network analysis based one Eigenvector analysis (Figure 2). The four key actors identified in the oil palm governance network in Indonesia are the Ministry of Agriculture (MoA), the Indonesian Palm Oil Association (GAPKI), the Ministry of National Development Planning (BAPPENAS), and the Indonesian Sustainable Palm Oil Commission of (ISPO). Based on social network analysis, the engagement needs to be done both for environment conservation and economic development actors since they have connected each other

Table 3. Value of degree, closeness/Eigenvector, and betweenness centrality of oil palm social network analysis in Indonesia (ranked)

Degree centrality			Closeness centrality/Eigenvector			Betweeenness		
Rank	Actors	Value	Rank	Actors	Value	Rank	Actors	Value
1	MoA	69	1	MoA	0.039	1	MoA	0.039
2	GAPKI	64	2	GAPKI	0.038	2	BAPPENAS	0.039
3	BAPPENAS	64	3	APROBI	0.037	3	ISPO	0.026
4	APROBI	63	4	ISPO	0.036	4	District government	0.022
5	ISPO	62	5	District government	0.036	5	Provincial government	0.022
6	District government	60	6	KADIN	0.036	6	MoEF	0.018
7	KADIN	60	7	BAPPENAS	0.035	7	GAPKI	0.017
8	IPB University	58	8	Provincial government	0.034	8	APROBI	0.016
9	Provincial government	58	9	IPB University	0.034	9	KADIN	0.015
10	RSPO	55	10	RSPO	0.034	10	MoF	0.014
11	SPKS	53	11	SPKS	0.032	11	IPB University	0.013
12	APKASINDO	52	12	APKASINDO	0.032	12	APKASINDO	0.009
13	ASPEKPIR	52	13	ASPEKPIR	0.032	13	SPKS	0.009
14	USAID	50	14	USAID	0.031	14	ASPEKPIR	0.009
15	IDH	49	15	IDH	0.031	15	RSPO	0.008
16	Greenpeace	48	16	Greenpeace	0.031	16	MoT	0.007
17	INOBU	47	17	INOBU	0.031	17	CMEA	0.006
18	WWF	47	18	WWF	0.031	18	USAID	0.005
19	Daemeter	47	19	Daemeter	0.031	19	CPOPC	0.004

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[4] https://trase.earth/flows?toolLayout=1&selectedContextId=5&selectedBasemap=satellite

Degree centrality			Closeness centrality/Eigenvector			Betweeenness		
Rank	Actors	Value	Rank	Actors	Value	Rank	Actors	Value
20	WALHI	47	20	WALHI	0.031	20	BPN	0.004
21	Yayasan Kehati	46	21	Yayasan Kehati	0.03	21	IDH	0.004
22	MoF	44	22	IFC	0.028	22	GGGI	0.003
23	IFC	43	23	GGGI	0.027	23	BPDP KS	0.003
24	KLHK	43	24	CPOPC	0.025	24	DPR	0.003
25	GGGI	42	25	MoF	0.024	25	Greenpeace	0.002
26	CPOPC	40	26	IOPRI	0.024	26	Yayasan Kehati	0.002
27	IOPRI	37	27	PASPI	0.024	27	INOBU	0.002
28	PASPI	37	28	MoEF	0.023	28	WWF	0.002
29	BPDP KS	36	29	DMSI	0.023	29	Daemeter	0.002
30	DMSI	35	30	BPDP KS	0.022	30	WALHI	0.002
31	MoT	35	31	MoT	0.019	31	President	0.002
32	CMEA	34	32	CMEA	0.019	32	IOPRI	0.001
33	BPN	29	33	BPN	0.016	33	PASPI	0.001
34	DPR	22	34	DPR	0.011	34	BRG	0.001
35	President	19	35	President	0.008	35	IFC	0.001
36	BRG	13	36	BRG	0.007	36	DMSI	0.001
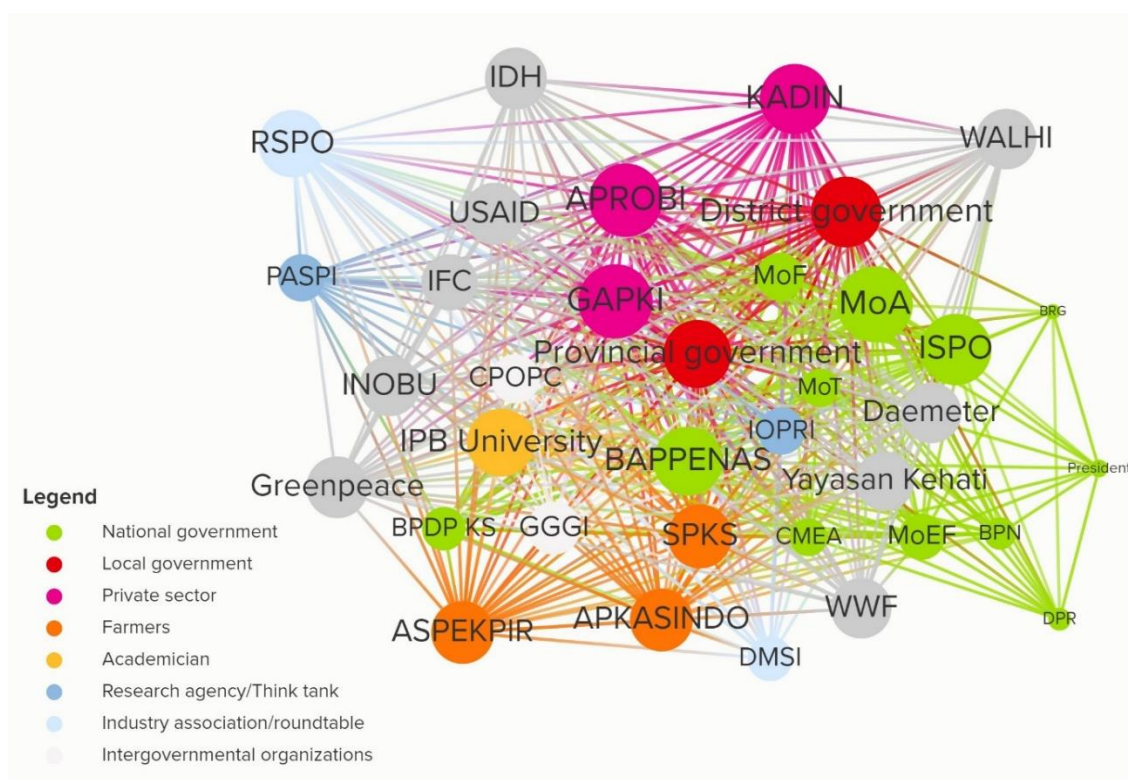
Figure 2 Social network map of oil palm actors in Indonesia based on closeness centrality/Eigenvector See abbreviation below[5]

[5] Abbreviations: **BAPPENAS**: The Ministry of National Development Planning; **MoA**: The Ministry of Agriculture; **MoF** (The Ministry of Environment and Forestry); **CMEA**: The Coordinating Ministry for Economic Affairs; **MoF**: The Ministry of Finance; **BPN**: The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency; **MoT**: Ministry of Trade; **DPR**: The National Parliament; **BPDPKS**: The Oil Palm Plantation Fund Management Agency; **BRG:** The Peatland Restoration Agency; **ISPO:** The

3.2.2. Coffee

3.2.2.1.Rationale

The scoping study for coffee in Indonesia was focused on Bukit Barisan Selatan National Park (BBSNP) in southern Sumatra. BBSNP is the third largest protected area in Sumatra, is situated in a key coffee producing region, and experiences heavy encroachment driven predominantly by coffee plantation expansion. The scoping work described the links between coffee production in BBSNP with deforestation and biodiversity loss. The scoping study also identified the role of coffee in local economies, supply chains and relevant stakeholders, as well as coffee certification in Lampung province. Figure 3 shows the map of BBSNP from a study by WCS in 2015. It shows the agricultural land identified in and surround the national park, also location where human-wildlife conflict occurred during 2008-2016.
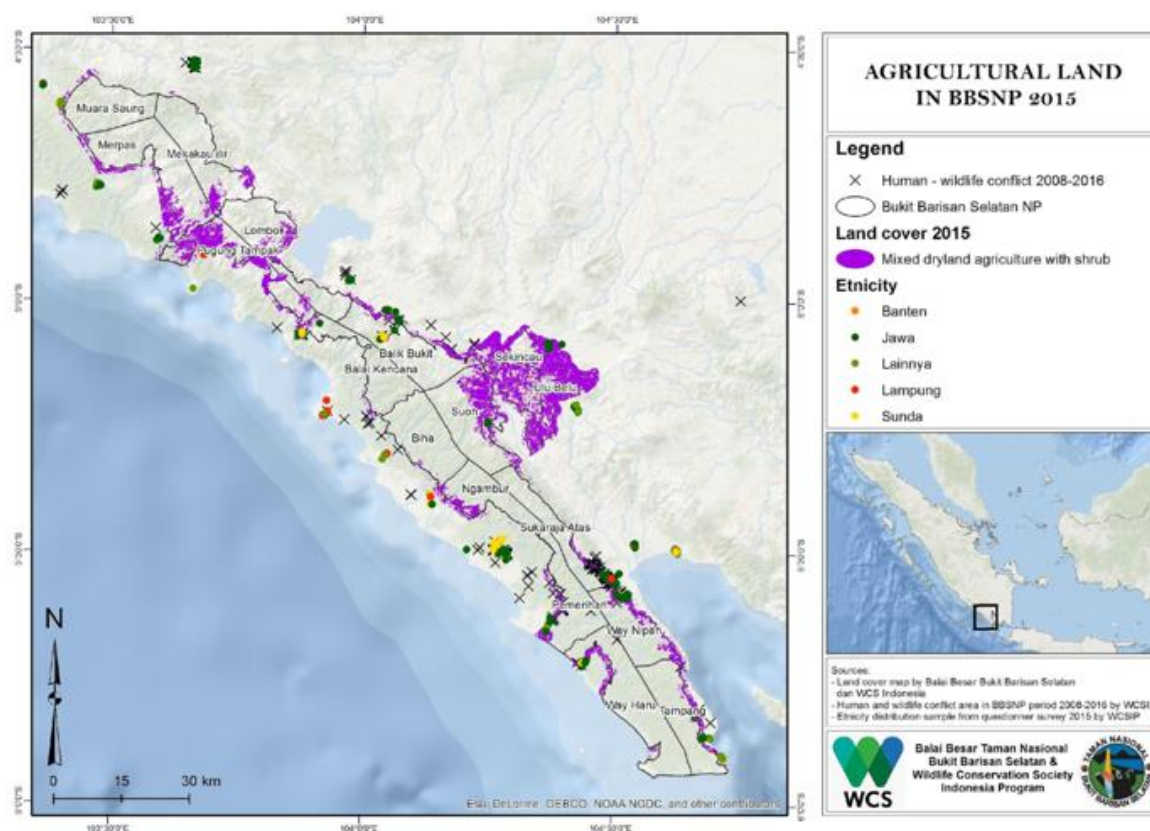
Figure 3. Location of Bukit Barisan Selatan National Park in southern Sumatra

3.2.2.2. Methodology

Data and information for the scoping study were obtained from a study of published and unpublished literature, including grey literature, combined with primary data collection conducted independently by Lampung University and WCS over the previous five years. Impacts of the coffee trade on biodiversity were described through the literature review,

while its deforestation and forest degradation impacts were determined through an analysis of literature assessing the linkages between coffee farming and deforestation combined with the results of spatial analyses and field research conducted in a coffee landscape in BBSNP. Stakeholder mapping was combined with Supply chain mapping conducted in landscapes around BBSNP and mapping of key stakeholders at the national level. Complete results are presented in Annex 5.

3.2.2.3. Key findings

Links between coffee development, deforestation and loss of biodiversity

- In general, there are two ways in which coffee development and trade can affect biodiversity. First, directly through the farm expansion. For example, using case studies from BBSNP, the direct consequences of deforestation from expansion of coffee production areas are a shrinking of the forest cover and forest fragmentation, as well as subsequent loss of habitats. Secondly, coffee production intensification can affect biodiversity more than traditional farming practices, which tend to consider biodiversity.

- Coffee is vulnerable to climate change. Impacts can include geographical shifts in land suitability, which could lead to the establishment of new coffee plantations in upland areas, and an increased new land conversion risk, including natural forest, with subsequent implications for biodiversity and ecosystem services. The risks coffee expansion poses to forested areas is demonstrated in Lampung province, where approximately 20,000 of Lampung's total Robusta production volume of 285,000 tons was sourced from illegal cultivation areas inside BBSNP (Gaveau *et al.*, 2009). Based on WCS land-use analysis, there were already 36,541 ha of non-forested land in BBSNP in 2000 (11.5% of the total area), with the majority classified as dryland agriculture (6.36% of the total park area). The study shows that in BBSNP, the total area categorized as artificial habitat increased by an average 1,398 ha a year to 15.4% of the total park area in 2005, 17.2% in 2011, and 18.11% in 2015. The extent of artificial habitat in park buffer zones had already reached 51% by 2000, increasing to cover 68.35% of the total buffer zone area by 2015.

Coffee farming systems in BBSNP and their roles in local economies

- There are a variety of community coffee farming systems inside BBSNP. Around 40% of illegally grown coffee inside the park was planted between 1990 and 2000, 22% before 1990, and the remainder after 2000. Around 44% of farmers with coffee plantations inside the forest are classified as encroachers and live in villages around BBSNP, while 56% are outsiders who come from various parts of Lampung province to grow coffee there, particularly during planting or harvest seasons (around 4% of these come in from Java). On average, each farmer has 1-2 hectares of land designated for coffee production. The majority of farmers (60%) secured land by purchasing it from locals, 26% from clearing forest estate (12% inheriting it from their parents), and 2% through a co-management or profit-sharing system. The majority of farmers inside BBSNP apply a simple shade farming system. Only a few farmers apply a more complex-shade farming system, which provides them with more benefits, due to the additional incomes they secure from various shade-tree products such as pepper, durian, avocado, candlenut, parkia, cinnamon, and banana.

- Coffee is Lampung province's second largest export commodity. In 2018, the province exported 139 tons of coffee to 27 destination countries. A World Conservation Society (WCS) socioeconomic survey of coffee farmers involving 425 respondents in 14 villages

in the northern part of BBSNP from 2018 suggests the majority of farmers (around 91% of respondents) rely on coffee as their main source of income, with 76% owning their own coffee farms, and 15% working as farm laborers.

Supply chain and stakeholder analysis

- The stakeholder mapping exercise revealed coffee supply chains to be complex and opaque, starting from the producer-level, which is dominated by smallholders, to local collectors. There are multiple levels of traders and trading companies, all engaged in the buying, selling, processing and movement of coffee. Coffee grown illegally inside the national park enters a complex supply chain early on and contaminates all subsequent stages of the supply chain, making full traceability and tracking of illegal coffee extremely challenging. At both domestic and international levels, roasters inherit the supply chain complexities and illegality risks from interactions between farmers and traders during the earliest stages of trading in the landscape. A map of the supply chain and relevant stakeholders in BBSNP and southern Sumatra is presented in Figure 4 below.

- Smallholders are the most vulnerable actors in the supply chain. With low yields, low levels of input and per capita production, and frequently burdened by tied loans, smallholders have very little leverage in the supply chain.

- Other actors, including domestic/export processing companies appear to remain broadly constant. During a campaign in 2007, for example, ten of the companies identified as being at risk of sourcing illegally produced coffee were major exporters or domestic roasters. Despite varying levels of commitment to sustainability initiatives and support for certification, such efforts are failing to address ongoing deforestation driven by coffee expansion, or individual company supply chain risks.

- There is a little evidence to suggest these efforts have been effective in reducing the adverse impacts of coffee production on forest cover within BBSNP park boundaries.

Figure 4. Diagram showing the coffee supply chain around Bukit Barisan Selatan National Park.

16

Coffee certification in Lampung province

- Rainforest Alliance (RA), Fair Trade (FT), UTZ and 4C form the mainstream of global certification systems in Indonesia.

- The implementation of coffee certification in Lampung province, particularly in West Lampung district, can be divided into two periods based on the number of companies involved. From 2005 to 2010, PT Indo Cafco began coffee certification in cooperation with the district government and farmer groups. The company started with UTZ certification in 2005, adding RA and 4C certification in 2008. From 2010, other companies began coffee certification using diverse approaches in the district. In 2014, five additional companies had initiated coffee certification – PT Nestlé Indonesia, Louis Dreyfus Company, PT Nedcoffee Indonesia Makmur Jaya, PT Indocom Citra Persada, and PT Samson Jaya (Fitriana 2019).

- Approximately 7,000 tons of certified coffee was produced in 2014. This represented around 14% of total Robusta production in West Lampung district (48,000 tons) (BPS West Lampung 2015).

3.3. Work Package 3 – Social impacts

3.3.1. Rationale

One of the impact areas of the TRADE Hub toward sustainable oil palm trade in Indonesia is to improve benefits and reduce impacts from the oil palm trades for people surrounding high-risk landscape. Thus, it is important to understand how the trade-off is going on at the community level in Indonesia to determine what needs to be improved and activities to address that in TRADE Hub. Those scope of work is the focus of social impact studies under Work Package 3 (WP3).

3.3.2. Methods

The literature review was carried out following the protocol by the WP3 global team with adaptation to the need of the Indonesia hub. Relevant peer-reviewed articles were searched using ISI Web of Knowledge's database. There were 209 publications from the year 2000 until now were found. After screening by several selection criteria, we found that 39 articles are relevant to the Indonesia context. Grey literature (non-journal articles) was searched in the CIFOR library and found 10 grey literature were relevant. After that, we conducted content analysis using Nvivo software. First step was to explore what most discussed issues, so we ran word frequency query to the literature. Results suggested three main topics: 1) Positive socio-economic impact, 2) Negative socio-economic impact, and 3) Barriers for sustainable practice for smallholder farmers. Last step was to analyse content of identified peer-reviewed articles and grey literature. The content of literature was coded based on three topics suggested in previous step. Results from this step were guide us to do further reading.

3.3.3. Findings and recommendations

- Various positive and negative socio-economic impacts of oil palm development to rural community in Indonesia. Results are summarized in table below:

Table 4. Identified socio-economic impacts of oil palm development to rural community in Indonesia

Positive Impacts	Negative impacts
- Employment opportunity, - Generating more income for farmers, - Better public facilities, infrastructure, and access.	- Human right violation, - Conflicts, - Inequity power and benefit-sharing between stakeholders e.g. migrant vs local/indigenous community, - Threatened food security for the forest-dependent community.

- Research team identified that the key driver of inclusive growth through oil palm development is involvement of smallholders. Independent smallholder is the most important direct stakeholder of oil palm in the rural area for WP3 intervention in Indonesia. Independent smallholders are now reported to be emerging in many places in Indonesia despite various challenges towards implementation of sustainable practice. Three most important barriers to address are technical barriers (how to maintain yield and productivity), access to finance, and compliance with sustainability standards.

- There is recommendation on importance to develop a business case that may give on the ground evidence of pathway to achieve sustainable smallholders practice in Indonesia towards sustainable trade. Other recommendation is that intervention in the research activities should carefully design, by considering the heterogeneity of smallholders and baseline socio-economic conditions in the rural area. Thus, study towards smallholder typology is important. WP2 scoping work suggested that smallholder behaviour may link to deforestation, so study on behaviour toward ecological sustainability is also important.

3.4. Work Package 4 – Trade policies and economic impacts

3.4.1. Rationale

The general objective of research was to understand global trades, the benefits they deliver for countries participating in trades, and those producing trade commodities, and whether they reduce impacts on high-risk forested landscapes and rural communities. In the case of palm oil, this objective raised a research question about the impacts of the palm oil trade on forested landscapes and rural communities. This question brought about the need to understand relations between the palm oil trade and trade outcomes in the context of the selection of palm oil as a commodity. Accordingly, the WP4 team developed a conceptual framework to interpret evidence associated with linkages between trade and trade outcomes for palm oil. The framework was derived from the TRADE Hub logical framework; thematic work on trading for development and global value chains (World Bank 2020) and tropical deforestation and commodity supply chains (WEF and TFA 2017); and the methodological approach for frameworks developed for systematic reviews to create evidence maps from Cheng et al. (2017) and McKinnon et al. (2016).

3.4.2. Methodology

A conceptual framework (Ekayana, Alfath and Mumbunan, in progress), is being developed from a series of meetings and consultations with palm oil trade experts and stakeholders, and from the outcomes of Focus Group Discussions (FGDs) held between December 2019 and March 2020. It conceptually frames plausible drivers through which palm oil trading is

defined, and their possible relations to resulting trade outcomes. With this framework, we expect to identify plausible relations between the trade in palm oil and trade outcomes (see Figure 5). The four categories of palm oil trading drivers include: endowment; markets; institutions; and trade policies. Trade outcomes are framed through six typologies: economic growth; job creation; poverty alleviation and prevention; income; food security; and sustainability, which includes deforestation, biodiversity, and environmental issues. We argue that: (i) analytically, framing typologies of trade outcomes needs to strike a balance between social-economic and biophysical matters to enable a unified assessment of trade, development and the environment as TRADE Hub seeks to achieve; and (ii) in terms of relevance, these matter to countries producing palm oil, which at the same time are largely forested. Current research on palm oil usually portrays the oil palm sector as either damaging or beneficial for the environment and rural livelihoods, but rarely looks at the complexity and the dynamics of the palm oil sector comprehensively from a broad scope (Hospes et al. 2017). Research trends, mainly on the sustainability of palm oil production, have risen to an imbalance in palm oil research that is not comprehensive, with the linkages between the trade in palm oil and trade outcomes complicated and often unclear, with little elucidation in the research of the mechanisms connecting them (Hansen 2015). A recent article proposed an inter and transdisciplinary framework for palm oil production, but did not focus on palm oil trade and trade outcomes (Hospes et al. 2017).

Figure 5. Conceptual framework for palm oil trade and trade outcomes.

3.4.3. Key findings
Palm oil trade chains in Indonesia

1. Trade drivers

- The palm oil trade sector consists of four fundamental trade-driver categories: endowment, markets, institutions, and trade networks (World Bank 2020).

- Endowment on palm oil production comprises financial aspects and technical capacities provided (Nurfatriani et al. 2019), as well as investment financing from government and the private sector (Parmudya, Hospes and Termeer 2016; Pramudya 2017). Infrastructure such as roads are an important component of the endowment (Felix 2019).

- Markets - Access relating to the ease of trade in the palm oil market depends on trade policies (Marks et al. 1998). Competitiveness of the palm oil market is affected by trade policies as they affect Crude Palm Oil competitiveness (Rifin 2010). Supporting trade policies have been directly related to deforestation (Lopez et al. 2005) by driving market demand for oil palm plantations (Pendrill et al. 2019). Growing demand for palm oil-based biodiesel has resulted in the biodiesel market as an alternative market (Mukherjee et al. 2014). Market demands in net palm oil-producing countries are mainly due to price advantages and growing biodiesel needs (Carter et al. 2007).

- Institutions - Regulations through institutions such as the Roundtable on Sustainable Palm Oil (RSPO) affect palm oil trading (McCarthy 2012). Standard certification through third-party institutions is often used as a standard in palm oil (Von Geibler 2013). Regulations on palm oil trading in certain countries are deemed insufficient to solve social and environmental problems raised (Khatarina 2018) with biodiesel regulations becoming more important with the growth in demand for palm oil feedstock for biodiesel (Caroko et al. 2011). Legality has also become a key element of palm oil trading where, despite many regulations, weak enforcement has led to illegal plantations (Pramudya, Hospes and Tameer 2018).

- Trade networks - May consist of Global Value Chains (GVC) which involve multiple stakeholders (Tong 2017). GVC has implications for economic growth and social and environmental sustainability (Pacheco et al. 2017). Another vital part is supply chains which concern the networks between companies and their suppliers to produce and distribute palm oil to buyers as current production networks have become globalized supply chains (McCarty et al. 2012).

b. *Trade outcomes*

- Outcome typologies consist of economic growth, job creation, poverty alleviation and prevention, income, food security, and sustainability, which includes deforestation, biodiversity, and other environmental issues.

- Trade balance, an important element of economic growth, looks at the difference between imports and exports, where growing concern for the sustainability of palm oil farming affects import demand for palm oil, and as a consequence, the economies of exporting countries (Jafari et al. 2017).

- Job creation - Palm oil investment helps generate formal and informal jobs and boosts economic output. However, those that benefit are mainly skilled migrants and not local poor (Obidzinski et al. 2014). Hence in-migration is another factor for job creation from palm oil trading, where development for expansion of the palm oil trade has meant employment driven migrations (Sandker 2017).

- The palm oil trade has impacted upon poverty alleviation efforts increasing rising returns for labor and land, and has had indirect effects through household investment, local government revenue and rural economic and social infrastructures (Edwards 2019). It may also result in poverty prevention.

- Income resulting from the palm oil trade may consist of indirect and direct income (Krishna et al. 2018; Widianingsih et al. 2019). There has been a positive impact from oil palm plantations on income levels with improvements in rural incomes (Chalil et al. 2019). However, to some extent palm oil expansions have been socially and environmentally costly (Budidarsono et al. 2012).

- Despite major negative consequences of palm oil for food security in certain regions, food security in the tropics may improve greatly from the palm oil sector carrying out environmentally sustainable certified small-scale palm oil production (Azhar et al. 2017).

- Sustainability - Zero deforestation commitments by private companies and moratoria may result cumulatively in a significant reduction in deforestation (Mosnier et al. 2017). This is necessary as the estimated value of lost ecosystem services is higher than the profits of newly established oil palm plantations (Acosta and Curt 2019). The international trade drives biodiversity threats in developing nations (Lenzen et al. 2012), while land-use change leads to losses of ecological functions (Teuscher et al. 2015). The biodiversity footprint of palm oil has also grown substantially due to growing demand, and that demand drives policies that lead to unintended shifts in environmental impacts (Tobben et al. 2018).

- The environment is an element of sustainability, that has experienced significant degradation from both input and output sides of palm oil trade activities (Chavalparit et al. 2006). Fires and haze have also resulted from palm oil trade activities as a consequence of deforestation and open burning due to the increasing demand for land for oil palm expansion (Othman, 2003). Finally, GHG emissions arising from land-use change, production and farming may vary for RSPO palm oil due to previous land use in peat soil areas (Bessou et al. 2014).

Wildlife trade chains in Indonesia

Reviews of reports and grey literature were conducted to collect information on wildlife trade chains in Indonesia. There are three wildlife trade chains in Indonesia. These are as follows:
- Legal wildlife trade chains

    Domestic wildlife trade chains begin with the catcher, and end, via the seller, with the end buyer, while international wildlife trade chains begin with the catcher and end, via the exporter, with the legal importer. Both chains involve a series of intermediaries, the number of which is generally lower for legal than for illegal trade chains.

I. Legal wildlife trade chains

(a) Domestic

| Catcher | → | Intermediaries | → | Seller | → | Buyer |

(b) International

| Catcher | → | Intermediaries | → | Exporter | → | Legal importer |
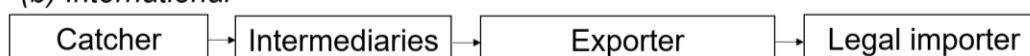
Figure 6. Legal wildlife trade chains.

- Quasi-legal wildlife trade chains

Quasi-legal domestic and international wildlife trade chains are similar in structure to legal ones in terms of actors and stages involved. The difference being they operate beyond the margin of legality, and on the fringes of legal trade in species, and therefore share elements of illegal trade chains. Traders in quasi-legal wildlife trade chains, for example, may exceed quotas, trade without licenses, or pass caught specimens off as captive-bred. Such actions are probably enabled by weak, or an absence of legal trade regulations, quota assessments, effective species management plans, or harvesting guidelines.

II. Quasi-Legal wildlife trade chains

(a) Domestic

| Catcher | → | Intermediaries | → | Seller | → | Buyer |

Beyond legal

(b) International

| Catcher | → | Intermediaries | → | Exporter | → | Legal importer |
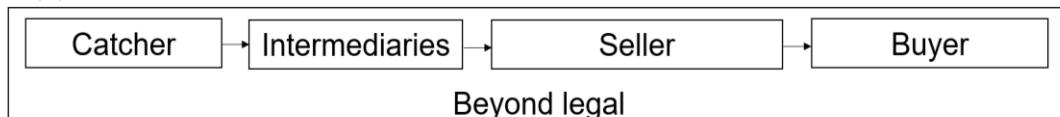
Beyond legal
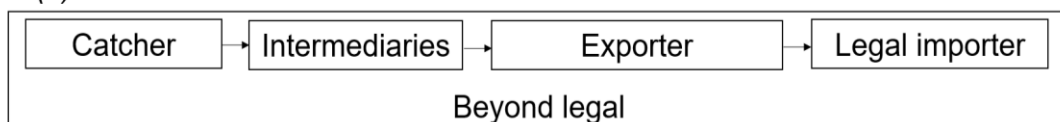
Figure 7. Quasi-legal wildlife trade chains.

- Illegal wildlife trade chains

These chains are generally more complex; domestic illegal wildlife trade chains from the hunter to the final buyer involve species receptacles in addition to a series of intermediaries, while international illegal wildlife trade chains involve smugglers as well as a series of intermediaries between the hunter and illegal importer. Intermediaries may vary contingent on trade routes and species, among other things.

III. Illegal trade chains

(a) Domestic

| Hunter | → | Intermediaries | → | Domestic receptacle | → | Final buyer |

(b) International

| Hunter | → | Intermediaries | → | Smuggler | → | Illegal importer |

Figure 8. Illegal wildlife trade chains.

All three chains involve actors that should become considerations when defining the stakeholders in trade policies and their economic impacts. Among other relevant reports, three by WCS were selected that explain the impacts of wildlife trading and trade impacts in Indonesia.

Economic value of the wildlife trade in Indonesia

Global demand for wildlife species and its products is estimated to be worth billions of USD per year. One study revealed that major drivers of wildlife commodity trading from 2006-2011 were luxury goods and food, traditional medicines, and pets and entertainment. Only a small part of the trade was driven by subsistence, culture, or research and education

23

purposes. (Baker et al. 2013). Asia is the primary source of wildlife commodities for the global market (Nijman 2010; Baker et al. 2013). Indonesia is a significant source and transit point for international wildlife trading (Traffic International 2008; Baker et al. 2013), and considered a 'wildlife trade hotspot' (Nijman 2010; Traffic International 2008). The value of Indonesia's wildlife trade, wild animal and plant species exports was USD 374 million in 2015 and increased to USD 580 million in 2017 (MoEF 2018). The most frequently traded wildlife species in 2017 were birds and reptiles (see Table 5) with values exceeding USD 124 million and 96 million respectively. Meanwhile, in 2017 the Government of Indonesia collected approximately USD 1 million equivalent in non-tax revenues from the domestic trade activities, including trapping, hunting, and transporting wild species (MoEF 2018b).

Table 5. Export value of wildlife commodities by taxa.

Species group	Export value (in USD x million)	Total number of exporters (in business units)	Major importers
1. Amphibians	9.7	12	France, Japan
2. Arthropods	1.6	11	USA, Germany, Singapore, South Korea
3. Birds	124	32	Bangladesh, Oman, Pakistan, Taiwan
4. Coral	2.8	64	USA, UK, Germany, France, Thailand, Netherlands, Belgium, Poland
5. Fish	22	42	China, Taiwan, Japan, Singapore
6. Mammals	1.4	25	Thailand, USA, Germany
7. Reptiles	96	100	Hong Kong, Japan, Singapore, Thailand, China, USA, Czech Republic, Taiwan

Source: MoEF (2018a)

Legal context of the wildlife trade in Indonesia

Indonesia has applied a set of rules and regulations for wildlife trading, while the international wildlife trade is regulated under the Convention on International Trade in Endangered Species (CITES) (Nijman 2010). CITES is global-scale convention that controls the import and export of wild flora and fauna between member countries. Trade controls cover species listed under CITES, which are separated into three Appendices: Appendix I, II and III. Indonesia signed CITES in 1973 and ratified it in 1978 through Presidential Decree No. 43/1978. The management authority for CITES in Indonesia is now MoEF, which has the authority to regulate export and import schemes for wildlife commodities and document international trade activities (Hanif 2015).

At the national level, wildlife trading is regulated under a natural resources conservation framework, with the highest-level piece of legislation being Law No. 5/1990 on Conservation of Natural Biological Resources and their Ecosystems. The latest regulation is Minister of Environment and Forestry Regulation No. 20/2018 on Protected Flora and Fauna Species, which lists 921 flora and fauna species as protected. Trading and trafficking of these protected species are illegal under this regulation and subject to legal sanctions including fines and prison terms. The only exceptions are for research, science, and conservation purposes, with an applicable permit from the Minister.

Government Regulation No. 7/1999 regulates the preservation of flora and fauna species, and includes the utilization and trading of wildlife species. Provisions in this regulation allow the trading of captive-bred wildlife species of second generation or above. For non-protected species, traded individuals can be sourced from captive breeding or caught from the wild. The trader should have a legally registered business entity, and any transportation is subject to a written permit.

In addition, Minister of Forestry Decree No. 447/2003 [6] stipulates administrative procedures for capturing or removing flora and fauna species from the wild, including species listed under CITES Appendices or protected under national legislation. It stipulates that wild flora and fauna may only be collected or trapped outside conservation areas, and that the government sets annual quotas for wild-caught species based on scientific recommendations. It also affords special attention to certain species that may only be traded or exchanged with other countries with permission from the President.

This legislation suggests both international and domestic wildlife trading seem well regulated in Indonesia. GoI has also undertaken many law enforcement efforts, including enforcement of environmental and forestry laws. A specialized Directorate General (DG) of Law Enforcement under MoEF was established in 2014, with combatting illegal wildlife trading and trafficking included under its main tasks (Tacconi, Rodrigues and Maryudi 2019). Nevertheless, illegal trading and trafficking in wildlife still persists in Indonesia (Hanif 2015). The Ministry's law enforcement efforts are often constrained by budget and field personnel limitations (Tacconi, Rodrigues and Maryudi 2019). Lubis (2017) highlighted legal loopholes and inconsistencies relating to regulations governing the wildlife trade. The Government conducted 187 wildlife seizure and confiscation operations between 2015 and April 2018, these resulted in the seizure of 12,966 illegally traded individual animals or body parts. The value of illegally traded wildlife has been estimated at around USD 900 billion (IDR 13 trillion) annually.[7] However the real value remains unknown, and could well be higher (Lubis 2017).

3.5. Work Package 5 – Modelling Trade Scenarios

3.5.1. Rationale

The main goal of TRADE Hub Indonesia is to ensure benefits from commodity trading, while reducing adverse impacts on high-risk forested landscapes and their rural communities. TRADE Hub Indonesia activities are designed to find the best solutions for addressing trade-offs between economic development and environment conservation in two land-based commodities, i.e. oil palm and coffee. Sustainability scenarios will be developed for all trade activities, starting from land use, to commodity production and impacts on livelihoods and the environment. Modelling trade scenarios will provide projections and information under different scenarios for decision makers and stakeholders. The Indonesia team carried out reviews on land-use modelling to identify research gaps and needs to support policy scenarios for rural development at the subnational and national levels in Indonesia.

3.5.2. Methodology

We selected and reviewed four groups of land use models: 1) Land-Use Change Driver Modelling (LUDM); 2) Land-Use Change Scenario Modelling (LUSM); 3) Land-Based Development Scenario Modelling for Decision Support (LDDS); and 4) Land-Based

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[6] Prior to being merged in 2014, The Ministries for Environment and Forestry were separate entities.
[7] http://ppid.menlhk.go.id/siaran_pers/browse/1203

Development Scenario Modelling for Negotiation Support (LDNS). In addition to these four groups, we also reviewed several models ICRAF has been involved in either directly or indirectly over the last 20 years. The complete review is provided in Annex 8 of the report.

3.5.3. Findings

Generally, some exchanges of components and techniques occur from one group to another, especially when components are developed in a modular manner. Nested decision making can be supported by nested models. Such technical and policy engagement processes across models are feasible and recommendable to tap the maximum benefits of a modelling exercise across scales and objectives in engaging a broad range of stakeholders in multilevel land governance. Table 6 below presents details for each of the models reviewed.

Table 6. Types of land use models.

Type of land use models	Description	Example
1. Land-use change driver modelling (LUDM)	This aims to understand the underlying drivers or proximate drivers of deforestation and land use/cover changes, without attempting to accommodate any scenarios to project future changes and/or the ex-ante impacts of changes. LUDM mostly uses empirical models; or underlying drivers mostly use econometrics or regression analysis, while proximate drivers are mostly spatially explicit in nature and use withers logistic regression to machine learning techniques, e.g. neural networks. LUDM for proximate drivers makes use of timeseries land use/cover maps as key input data, produced from remotely sensed imagery, through advances in Remote Sensing and GIS techniques.	Dinamica EGO
2. Land-use change scenario modelling (LUSM)	This aims to project future land use changes, simulate a few scenarios and produce ex-ante impacts of projected land uses under particular scenarios.	Agent-based or semi agent-based models: 1. FALLOW (Van Noordwijk 2002) 2. LUDAS (Le et al. 2008) 3. LUCES (Suwarno et al. 2018) Another model that is widely used in Indonesia: 1. InVEST (Integrated Valuation of Ecosystem Services and Tradeoffs)
3. Land-based development scenario modelling for decision support (LDDS)	Decision Support models in land uses have been widely developed but less widely used compared to the high expectation behind the model building. However, there are a few models that have been successful in influencing decision making.	Mostly at the national level: 1. GLOBIOM 2. System Dynamics models, such as IPOS (Indonesian Palm Oil Simulation) model (Purnomo et al. article under review)
4. Land-based development scenario modelling for negotiation support (LDNS)	LDNS enables potential users, including scientists, to reach out and articulate needs. Scientists, for example, may address their needs for scientific-based foresighting analysis for climate change mitigation, which then evolves to green growth and low carbon development.	LUMENS (Land Use Planning for Multiple Environmental Services) developed by ICRAF

3.6. Work Package 6 - Private sector solutions and impacts

3.6.1. Rationale

The WP6 scoping study in Indonesia aimed to address the following research question: 'What is the state of knowledge of corporate commitments to zero biodiversity loss, zero habitat loss or doing no harm to local people?' As the Indonesia team's scoping study will link to a global WP6 work plan, scoping work by the WP6 team in Indonesia covered assessments of existing private sector-led supply chain actors, and included sustainability initiatives, platforms, compacts and public-private partnerships.

3.6.2. Methodology

The Indonesia team conducted a review of private sector-led platforms, initiatives and aimed at preventing and mitigating biodiversity and habitat loss resulting from agricultural commodity development. In addition, the review covered the extent to which private sector initiatives and policies address wildlife protection and illegal trading issues. The scoping study mostly involved reviewing relevant literature (electronic databases, reference lists, journals, corporate websites, etc.), relevant publications, and interview notes from a recent CIFOR oil palm project (the USAID-funded Governing Oil Palm for Sustainability project). The review followed the typologies and characteristics of the main private initiatives for promoting zero deforestation from Lambin et al. (2018). During the review, these initiatives were grouped into the following four types:

1. Collective aspirations
2. Certification schemes
3. Company pledges
4. Codes of conduct adoption

Detailed methodologies and results are presented in Annex 9. Most initiatives, platforms and standards listed in the scoping were focused on oil palm.

3.6.3. Findings

- Various private sector commitments, initiatives and standards have been made that function as safeguards for preventing biodiversity and habitat loss, and respecting local communities. These were classified under four typologies: 1) collective aspirations; 2) certification schemes for sustainable palm oil; 3) company pledges; and 4) commitments to responsible business through codes of conduct (see Table 7 below).

- Degrees of success have varied in terms of how effective the implementation and adoption of standards have been, and how commitments have translated into expected outputs and outcomes. Persistent challenges hamper effective realization of commitments. These challenges include: a lack of coherent legal frameworks (e.g. HCV and HCS set ups); performance monitoring constraints resulting from unclear definitions and criteria for achieving verifiable outcomes; different sustainability visions among stakeholders; a lack of transparency, particularly for corporations; and a lack of incentives.

Table 7. Private sectors commitments, initiatives and standards.

Example	Profile and Initiators
1. Collective aspirations towards minimizing biodiversity and social impacts	
1.1. Consumer Goods Forum	A network of CEOs and senior management from more than 400 retailers, manufacturers, service providers and others who announced a resolution to halt deforestation in November 2010.
1.2. One Planet Business for Biodiversity (OP2B)	A unique international cross-sectoral, action-oriented business coalition on biodiversity with a specific focus on agriculture, launched at the United Nations Climate Action Summit in New York on 23 September 2019. Current members are 19 major companies including Danone, DSM, Kellogg's, L'Oreal, Unilever, Migros, and Nestlé.
1.3. Palm Oil Innovation Group (POIG)	Established in 2013, this is a multi-stakeholder initiative that strives to achieve the adoption of responsible palm oil production practices by key players in the supply chain through developing and sharing a credible and verifiable benchmark that builds upon the Roundtable on Sustainable Palm Oil (RSPO) as well as creating and promoting innovations. The group was initiated by progressive palm oil producers such as Musim Mas, New Britain Palm Oil, Agropalma, and leading NGOs such as Forest Peoples Programme, WWF, Wetlands and Rainforest Action Network.
1.4. Forum for Sustainable Palm Oil (FONAP)	A platform for the exchange of information and ideas on the production and procurement of certified sustainable palm oil. It currently has 52 members and supporters, including small, medium-sized and multinational companies as well as non-governmental organizations, consultancy companies, and associations. The aim of FONAP is to boost the proportion of certified palm oil, palm kernel oil and their derivatives and fractions significantly on the German, Austrian and Swiss markets. Agrarfrost Germany, Borneo Orangutan Survival (BOS) Deutschland e.V. International Sustainability & Carbon Certification (ISCC), Solidaridad and WWF Deutschland are among the members of this forum.
1.5. *Forum Kelapa Sawit Berkelanjutan Indonesia (FoKSBI)*	A national multi-stakeholder platform established in 2014 and led by the Indonesian MoA aiming to define and address the underlying root causes of limiting the achievement of sustainability goals in the oil palm sector and to coordinate existing public and private sector initiatives focused on the sustainability of palm oil. Members of this forum include government agencies, universities, international development partners, private sector actors, civil society, and NGOs.
2. Certification Schemes for Sustainable Palm Oil	
2.1. Roundtable on Sustainable Palm Oil (RSPO)	RSPO was established in 2004 to promote sustainable production of palm oil. It unites stakeholders from the seven sectors of the palm oil industry: oil palm producers, processors or traders, consumer goods manufacturers, retailers, banks/investors, and environmental and social non-governmental organizations (NGOs), to develop and implement global standards for sustainable palm oil. RSPO principles and criteria for sustainable palm oil production were issued in 2013 and revised in 2018. These consist of seven principles applicable to sustainable palm oil production worldwide, comprising legal, economic, environmental, and social aspects
2.2. The International Sustainability and Carbon Certification (ISCC)	ISCC was established in 2006 and aims to contribute to the sustainable cultivation, processing and use of different kinds of biomass in members' products. The ISCC's 202 sustainability requirements document (ver. 3.0, 2016) sets out six sustainability principles decided through a multi-stakeholder process.
2.3. Rainforest Alliance 2017	This standard is applicable for crop and cattle production systems worldwide. It includes all crops and cattle products produced within a

Example	Profile and Initiators
Sustainable Agriculture Standard	farm's limits with an emphasis on crops and/or products of production systems that are commercialized or intended for commercialization. It recognizes the challenges posed by climate change and seeks to address these challenges by actively promoting climate smart agriculture and improving the resilience of farms and farming communities.
3. Company pledges towards minimizing biodiversity and social impacts	
3.1. Sustainable Palm Oil Manifesto	Signed in July 2014, this initiative brought together leading palm oil growers, traders, and end users such as Sime Darby Plantation, IOI Corporation Bhd., Kuala Lumpur Kepong Bhd., Musim Mas Group, Asian Agri, Apical, and Cargill, who are committed to setting higher sustainability standards in addition to the RSPO Principles and Criteria.
3.2. Sustainability policies by corporate groups or individual companies	Examples of sustainability policies for oil palm by major companies include those of Wilmar International Ltd (2013), Golden Agri Resources (2011 and 2015), Musim Mas (2014), Asian Agri (2015), and Sime Darby (2008 and 2016).
4. Commitments to responsible business through the adoption of codes of conduct	
4.1. Codes of conduct by corporate groups or individual companies	Examples of codes of conduct by notable corporate groups are those of Unilever's Responsible Sourcing Policy (2014 and 2017) and Nestlé's Responsible Sourcing Standard (2018).

3.7. Work Package 7 – Public sector solutions and impacts

3.7.1. Rationale

WP7 aims to identify existing Indonesian public sector initiatives and approaches towards minimizing biodiversity loss, zero habitat loss, and preventing harm to local people in connection to global trade commodities such as palm oil. Together with WP6, WP7 will assisted the Trade Hub project in achieving Outcome 5, i.e. government regulators and private enterprises engaged in palm oil, coffee, and wildlife commodity production and trade better incorporate sustainability information into decision making. In order to do so, WP7 identified major central and regional government policies and regulations governing natural resource management, biodiversity conservation, and social safeguards. It also discussed specific stipulations relevant to potential impacts resulting from oil palm plantation expansion, as well as relevant government agency, NGO, and development project initiatives or approaches for preventing biodiversity and habitat loss and harm to local people.

3.7.2. Methodology

We conducted a desk review of GoI policies and regulations that support the implementation of international conventions. These included major laws and regulations governing plantation and industry operations, and protection of biodiversity and local people. We also reviewed safeguard policies, such as ISPO and presidential instructions, for preventing biodiversity loss and undue harm to local people. We reviewed which ministries, government agencies, and regional heads are linked to strategies and actions specified in Presidential Instruction No. 6/2019 on the National Action Plan for Sustainable Palm Oil, and assessed relevant programs and initiatives in order to provide a comprehensive analysis.

3.7.3. Findings

- GoI has issued policies and regulations aimed at managing and protecting biodiversity and ecosystems across agriculture and forest landscapes. To support the

implementation of international conventions, in 1994, GoI ratified the United Nations Convention on Biological Diversity by issuing Law No. 5/1994, stating its full commitment to conservation, protection and global cooperation. The IBSAP (Indonesian Biodiversity Strategy and Action Plan 2015-2020), aimed to achieve various Aichi Targets.

- GoI has ratified two international covenants ensuring that people's economic, social and cultural rights are protected, respected and recognized. It issued Law No. 11/2005 on Ratification of the International Covenant on Economic, Social and Cultural Rights, and Law No. 12/2005 on Ratification of the Covenant on Civil and Political Rights. GoI has also ratified conventions regarding international labor organizations, among others including Law No. 6/2012 on the convention on the protection of the rights of all migrant workers and their family members.

- Major laws and regulations governing plantations and industry operations, and the protection of biodiversity and local people that affect oil palm plantation development are shown in Table 8 below. A more detailed analysis of their substance and articles is available in Annex 9.

Table 8. Major laws and regulations affecting oil palm plantation practices.

No.	Laws and regulations	Substance and articles relevant to the protection of biodiversity and prevention of habitat loss
1	Law No. 5/1990 on Conservation of Natural Biological Resources and their Ecosystems	This law highlights the importance of conserving natural resources and their conservation, and provides a basis for subsequent regulations relevant to how natural resources and ecosystems should be sustained for the sake of human wellbeing, actors responsible for doing so, and penalties for failing to comply with the law.
2	Law 32/2009 on Environmental Protection and Management	This law specifies measures for protecting, conserving and managing the environment in systematic and integrated ways. It stipulates measures including planning, utilization, control, maintenance, supervision and law enforcement.
3	Law No. 41/1999 on Forestry	While its provisions are mostly relevant to how forests are governed, planned, protected and managed, this law specifies different types of forests, including production forests that can be converted for other non-forestry uses (Article 19) including oil palm businesses.
4	Law No. 39/2014 on Plantations	This law defines how sustainability principles are understood and adopted in the plantation sector, and asserts that plantation development is intended for increasing the wellbeing of the people, generating foreign exchange, providing employment, protecting business as well as local people, and ensuring responsible business practices.
5	Law No. 26/2007 on Spatial Planning	This law outlines procedures for allocating land across various production and conservation zones for use at different levels of government (national, provincial, and district). It guides the planning, implementation and oversight of land (spatial) uses across levels, actors and sectors. This law is key to the development of land-based investments, including agriculture and plantations.
6	Law No. 18/2013 on Prevention and Control of Forest Degradation	This law was enacted in 2013 amid concern over increased forest damage due to illegal logging, mining and plantations (primarily oil palm plantations),

No.	Laws and regulations	Substance and articles relevant to the protection of biodiversity and prevention of habitat loss
		resulting in state losses and having severely damaging environmental and social impacts, and causing global warming. The law was designed specifically to enforce existing polices and to provide a stronger basis for tackling extraordinary, organized and cross-border crime in the forestry and plantation sectors.
7	Law No. 5/1990 on Conservation of Natural Biological Resources and their Ecosystems; Law No. 32/2009 on Environmental Protection and Management; State Minister for Environment Regulation No. 29/2009 on Guidelines for the Conservation of Regional Biodiversity	These pieces of legislation require permit holders to set aside areas within oil palm plantation concessions. Similar to HCV, those areas with high conservation value, and of ecological, social, and/or cultural importance – referred to as *Kawasan Ekosistem Esensial* (KEE) or essential ecosystem areas – are designated as areas to be protected from conversion for plantations. They also provide the basis for establishing such essential ecosystem areas.
8	Government Regulation No. 104/2015 on Procedures for Changing Forest Estate Designation and Function	This regulation provides a basis for preventing and tackling encroachment into the forest estate, and includes oil palm expansion.
9	Government Regulation No. 46/2017 on Environmental Economic Instruments	This regulation sets out a number of economic instruments aimed at incentivizing relevant actors, including companies, central and local governments to conserve the environment, enrich biodiversity, and prevent destructive activities.
10	Government Regulation No. 10/2010, Government Regulation No. 104/2015 and Minister of Environment and Forestry Regulation No. P.51/ Menlhk/Setjen/ KUM.1/6/2016 on Procedures for Changing Forest Estate Designation and Function	These pieces of legislation legalize the use of forests and the conversion of forest estate for other non-forestry purposes. They specify that lands categorized as production forests, either forested or non-forested, can be converted into oil palm plantations.
11	Presidential Regulation No. 88/2017 on Resolution of Tenurial Issues over State Forest Estate, and Minister of Environment and Forestry Regulation No. P.83/Menlhk/Setjen/Kum.1/10/ 2016 on Social Forestry	These regulations outline mechanisms for resolving tenure issues when people, either individually or in a group, control areas of state forest estate illegally and use them for settlements, public and social facilities, or plantations.

- The major regulations affecting the oil palm sector are laid out in Minister of Agriculture Regulation No. 11/2015 on the Indonesian Sustainable Palm Oil (ISPO) certification system, which sets out sustainability principles and criteria for large-scale plantation development and CPO processing companies, and for tied and independent smallholders. The system is mandatory for companies, but is voluntarily for smallholders and companies producing CPO for renewable energy.

- Over the last two years, President Jokowi has instructed different ministries and government agencies, including governors and district heads, to improve the governance of forests and peatlands, protect natural forests and peatlands, prevent deforestation and land degradation, improve crop productivity, and accelerate efforts to promote and attain the country's sustainable palm oil goals. These requirements have been laid out in three different presidential instructions:

1. Presidential Instruction No. 8/2018 on a Moratorium on New Oil Palm Licenses and Improving Oil Palm Crop Productivity;
2. Presidential Instruction No. 5/2019 on a Moratorium on New Licenses and Improvement of Primary Forest and Peatland Governance; and
3. Presidential Instruction No. 6/2019 on the National Action Plan for Sustainable Palm Oil.

- In relation to Presidential Instruction No. 6/2019, we identified the Coordinating Ministry for Economic Affairs, the Ministry of Finance, the Ministry of National Development Planning, the Ministry of Agriculture, the Ministry of Environment and Forestry, the Ministry of Agrarian Affairs/ National Land Agency, the Ministry of Foreign Affairs, the Ministry of Home Affairs, the Geospatial Information Agency, as well as governors and district heads to be key stakeholders in implementing the strategies and action specified in the instruction.

- Programs relevant to Presidential Instruction No. 6/2019 include: updating, integrating and compiling oil palm plantation land cover spatial data; enhancing biodiversity conservation across oil palm landscapes; enhancing the capacity of smallholders in adopting good agricultural practices and ISPO standards; improving the governance of oil palm plantations and resolving any related disputes; and lastly, accelerating ISPO certification and increasing Indonesia's access to global CPO markets.

- Through the Ministry of Environment and Forestry, GOI is striving to conserve and protect biodiversity outside conservation areas through its policy on *Kawasan Ekosistem Esensial* (KEE) or essential ecosystem areas. KEEs are areas of ecological significance outside conservation areas, that if conserved and protected, would support the sustainability of life and be essential for biodiversity conservation and community wellbeing. The Minister of Agrarian Affairs and Spatial Planning issued Circular Letter No. 10/SE/VII/2015 on Issuing Licenses for High Conservation Value Forests.

- Different initiatives, aimed at protecting areas inside oil palm concession boundaries that are essential to biodiversity conservation, are underway and involve central, provincial and district governments in some provinces across the country. A collaborative essential ecosystem area protection model is currently being developed in West Kalimantan. However, despite the apparent potential of the government-led KEE policy, most of efforts to protect high conservation value (HCV) and high carbon stock (HCS) areas are still being driven by markets and voluntary certification.

3.8. Work Package 8 – Innovation, technology, and outreach

3.8.1. Rationale

TRADE Hub Indonesia's WP8 is expected to support the enhancement of trade transparency and research on impacts. Its objectives are to disseminate findings on and resources for existing platforms. In addition, it is expected to produce a tool or mobile application during the Trade Hub project lifetime. Consequently, as a starting point, it was necessary to conduct a scoping study to explore existing platforms that provide databases and visualizations relating to trade, with a specific focus on themes and topics relevant to the TRADE Hub project. For the scoping study, the Indonesia team focused on identifying existing platforms and the actors involved (data providers, developers, and financiers/donors), and their roles across the network. Finally, the team produced a

database of existing platforms, along with maps of stakeholders and potential partners (data providers and developers).

3.8.2. Methodology

Data mining was conducted through the Google search engine using Google Chrome version 77.0.3865.90 combined with NCapture for Chrome; an extension for capturing and importing webpages for qualitative data analysis in the data analysis software, NVivo. Keywords used were "trade data visualization", "trade database", *"visualisasi data perdagangan"*, and *"database perdagangan"*. Following data analysis, platforms were selected, and their developers, data providers, and financiers/donors were identified. Next, a Social Network Analysis (SNA) was conducted using the Kumu data visualization tool in order to gain a greater understanding actors' roles. The SNA was limited to 'data provider' and/or 'developer', to align with study objectives. A complete report is available in Annex 10.

3.8.3. Findings

- The data mining resulted in 314 data entries with a composition of: 33% entries linked directly to platforms (33%), entries categorized as news and general articles (28%); entries related to journals, books, reports, and scientific articles (25%), and others, such as vacancies and procurement (2%).

- Twenty-nine (29) platforms were selected for the review. Data collected from each platform included: web address, developer(s), donor(s), data provided, data source, type of spatial coverage, and commodity data availability. A full list of the national and international platforms reviewed is available in Annex 10.

- Of the 29 platforms, approximately 97% provided data on and/or visualizations of international trade for more than one country, while around 93% contained data on and/or visualizations of Indonesian trade.

- Data for coffee was found in 79% of the platforms, data on palm oil in 90%, while data on wildlife was only available in 31% of the platforms.

- There were 159 actors involved across the 29 platforms. These comprised organizations (95%) and individuals (5%) playing different roles from developers, and data providers, to financiers. A single actor might engage in more than one platform, or could play more than one role in a single platform as well as in multiple platforms (see Figure 9). Around 41% or 65 actors were data providers, 30% were developers, and 14% were financiers.

- Based on the SNA, we identified the top 20 developers and data providers for trade platforms based on centrality degree calculations (in-degree, out-degree, and Eigenvector). Results are summarized in Table 9 below. In-degree measurement recognizes the popularity of the nodes, which is influenced by the higher numbers of connections they have (see Figure 10). However, as this is not an absolute guarantee of the importance of the stakeholder, a combination of degree and Eigenvector were used (see Figure 11). The Eigenvector recognizes that the most important information would flow to important neighbors—which signaled the importance of a stakeholder would be between the importance of its neighbors (Mohammad et al. no date; Hagan et al. 2015).

Table 9. Top 20 developers and data providers for trade platforms.

	Developer and Data Provider Rank		
Rank	In-degree	Out-degree	Eigenvector
1	Vizzuality	Vizzuality	World Resources Institute
2	World Resources Institute	World Resources Institute	Center for Global Development
3	Center for Global Development	Center for Global Development	Google
4	Google	Google	University of Maryland
5	University of Maryland	University of Maryland	Vizzuality
6	The Jane Goodall Institute	The Jane Goodall Institute	The Jane Goodall Institute
7	Transparent World	Transparent World	Transparent World
8	USAID	USAID	USAID
9	The Tilia Fund	The Tilia Fund	The Tilia Fund
10	Blue Raster	Blue Raster	Blue Raster
11	ScanEx	ScanEx	ScanEx
12	ESRI	ESRI	ESRI
13	Danida	Danida	Danida
14	Bobolink Foundation	Bobolink Foundation	Bobolink Foundation
15	Norwegian Ministry of Climate & Environment	Norwegian Ministry of Climate & Environment	Norwegian Ministry of Climate & Environment
16	OSFAC	OSFAC	OSFAC
17	UK Aid	UK Aid	UK Aid
18	Netherlands Ministry of Foreign Affairs	Netherlands Ministry of Foreign Affairs	Netherlands Ministry of Foreign Affairs
19	UNEP	UNEP	UNEP
20	Carto	Carto	Carto
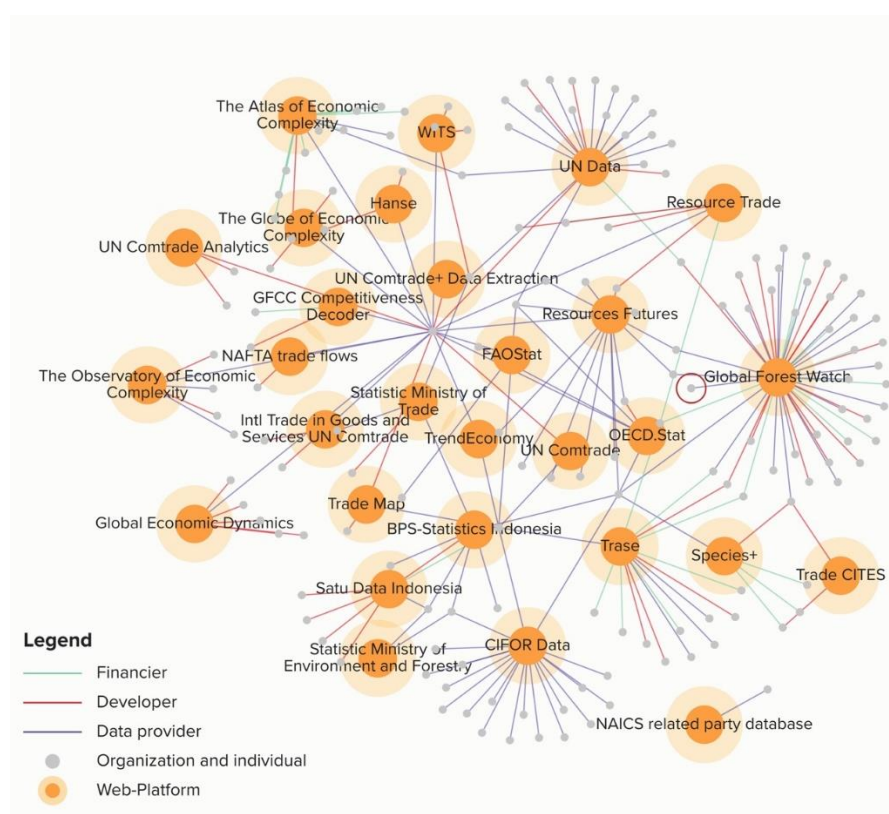
Figure 9. Map of organizations and individuals and their connections to the platforms they support. Find more details on this map at https://embed.kumu.io/2dfc6a4b98c399c17b3b266836cf5dbe
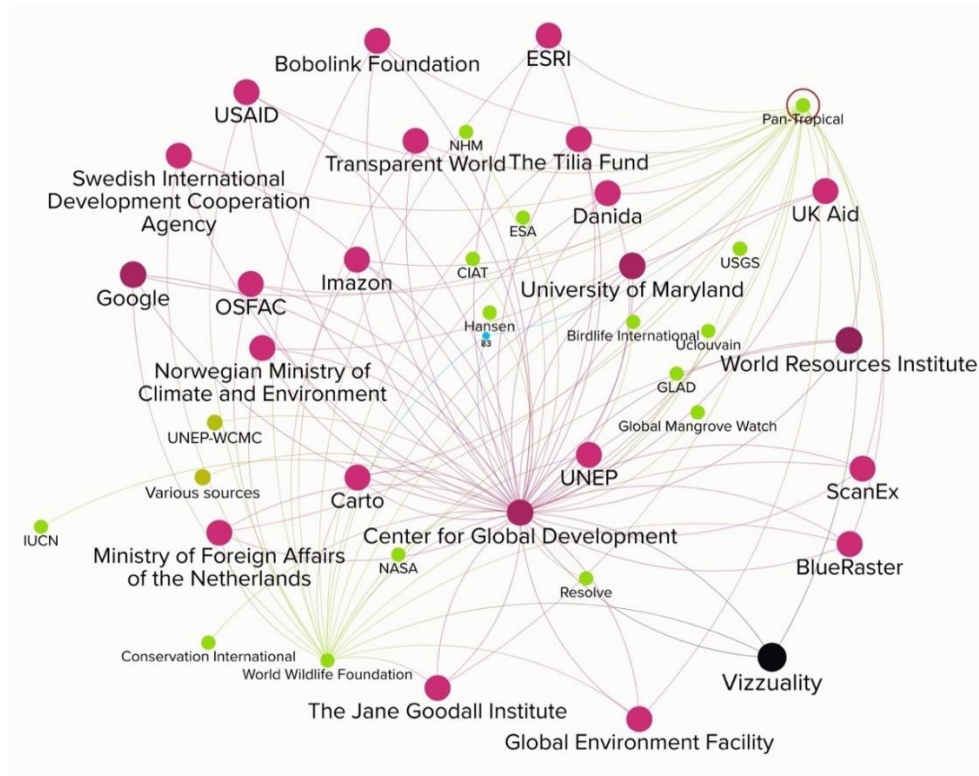
Figure 10. Map of developers and data providers across 29 platforms based on in-degree value.
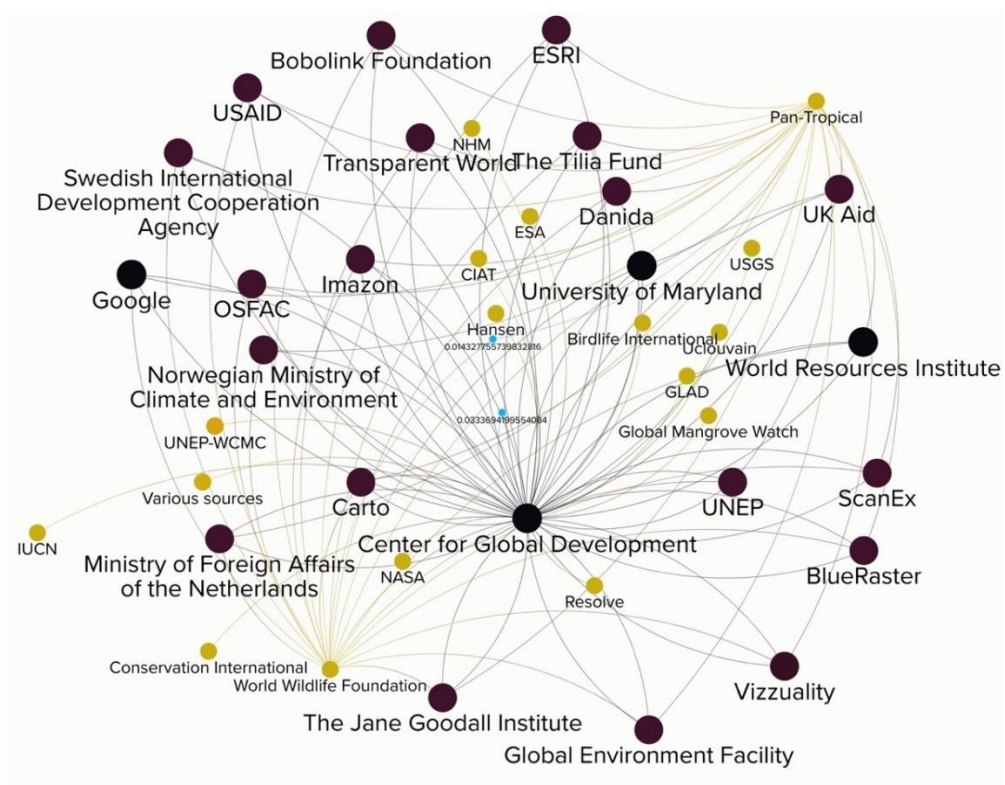
Figure 11. Map of developers and data providers based on Eigenvector calculations..

3.9. Work Package 9 – Capacity building

3.9.1. Rationale

Indonesia, a country with abundant natural resources, is one of the key players in the trade of agricultural commodities and wildlife. However, there is still lack of understanding among stakeholders on how the global trade in palm oil contributes not only to economic development but also to environmental sustainability (biodiversity loss, habitat loss and local people). To create effective communication and relationships, it was necessary to identify knowledge gaps for each stakeholder in each commodity. Stakeholder mapping and training needs assessments were needed to identify knowledge gaps for each stakeholder in order to support effective planning, and later, to achieve the desired project outcomes. Capacity building is one of the activities planned for the TRADE Hub project, to help public policymakers and other relevant stakeholder guide investment decision making along supply chains towards supporting sustainable development and the environment.

3.9.2. Methodology

Stakeholder mapping and training needs assessments for capacity building were carried through a desk study and literature review, and internal discussions among the research team regarding existing institutional networks, and capacity building needs. A complete report is provided in Annex 11.

3.9.3. Findings

1. Key actors were identified for the palm oil, coffee, and wildlife trade sectors (see Figures 12, 13, and 14). Actor identification was important to determine which stakeholders should be targeted for capacity building. These actors were grouped into four categories: 1) Government, 2) Private Sector, 3) Civil Society Organization, and 4) Financial Institution.

Government	Private Sector	Civil Society Organization	Financial Institution
•Ministry of Agriculture	•Palm Oil Producer Association (GAPKI)	•SPKS	•IFC
•Ministry of Environment and Forestry	•Biodiesel Producer Association (APROBI)	•Apkasindo	•BKPM
•Peatland Restoration Agency	•RSPO	•Aspekpir	•Bank Artha Graha
•CPO Fund	•PASPI	•IDH	•BRI Syariah
•Department of Agriculture and Plantations	•Sinar Mas	•WWF	•Bank Central Asia
•Council of Palm Oil Producing Countries	•Asosiasi Pengusahaan Hutan Indonesia	•INOBU	•Bank Mandiri
•Coordinating Ministry of Economic Affairs	•FSC Indonesia	•Daemeter	•Bank Muamalat
•ISPO Secretariat	•RSPO Auditing Consultant	•GGGI	•Bank Negara Indonesia
•IOPI		•Greenpeace	•Bank Jabar dan Banten
•Ministry of Trade			•Bank Rakyat Indonesia
•BAPPENAS			

Figure 12. Key actors in the palm oil sector.

36

Government	Private Sector	Civil Society Organization	Financial Institution
•Indonesian Coffee and Cocoa Research Institute •Coordinating Ministry of Economic Affairs •Aceh Department of Agriculture and Plantations •South Sumatra Department of Agriculture and Plantations •West Kalimantan Department of Agriculture and Plantations •Ministry of Trade •BAPPENAS	•Asosiasi Eksportir dan Industri Kopi Indonesia •PT Kapal Api •Nestlé	•UTZ/Rainforest Alliance	•BKPM •Bank Artha Graha •BRI Syariah •Bank Central Asia •Bank Mandiri •Bank Muamalat •Bank Negara Indonesia •Bank Jabar dan Banten •Bank Rakyat Indonesia

Figure 13. Key actors in the coffee sector.

Government	Private Sector	Civil Society Organization
•Ministry of Environment and Forestry •Indonesian National Police •Ministry of Law and Human Rights •Ministry of Finance •Papua Provincial Natural Resources Conservation Agency (BKSDA)	•Poachers •Intermediaries •Consumers •Exporters	•Profauna •Yayasan Kehati •Wildlife Conservation Society •Worldwide Fund for Nature •Burung Indonesia •International Animal Rescue •Conservation International •Yayasan Konservasi Alam Nusantara •Flora & Fauna International Indonesia

Figure 14. Key Actors in the wildlife trade.

2. Key institutional networks with potential for TRADE Hub Indonesia capacity building for sustainable investment have been identified. These are as follows:

a. Government regulatory network

- The Indonesia Green Growth Program (IGGP) hosted by the Ministry of National Development Planning (BAPPENAS) consists of three main activities: a) Capacity building, b) Green investment, and c) Green growth knowledge.

- Key actors relevant to sustainable investment decision making in relation to the oil palm industry are: the Ministry of Environment and Forestry (MoEF), the Coordinating Ministry for Economic Affairs (CMEA) and the Ministry of Finance (MoF). The specialized government regulator for capacity building is the State Administration Agency (LAN).

b. Financial institution network

The Indonesia Sustainable Finance Initiative, which brings together Bank Muamalat, Bank Artha Graha Indonesia, Bank Mandiri, Bank Central Asia, BRI Syariah, Bank Negara Indonesia, Bank Pembangunan Daerah Jawa Barat dan Banten, and Bank Rakyat Indonesia as the 'Pioneer on Sustainable Banking'. The initiative aims to promote and implement inclusive sustainable finance practices. Eight national banks in Indonesia with accumulative assets of up to 46% of the country's total banking assets, together with WWF-Indonesia, launched the 'Indonesia Sustainable Finance Initiative' (ISFI).

c. Private sector network

Based on a network analysis carried out specifically for the palm oil industry (Siregar et al. 2016), the Indonesian Palm Oil Association (GAPKI) has a central role in Indonesia's palm oil industry. This ties in with the actor analysis for oil palm governance in WP2, where GAPKI is one of most relevant and powerful actors in the industry.

d. NGO network

WWF-Indonesia was identified as the most relevant NGO network to be engaged with.

3. Based on the literature review, there are several training topics in sustainable trade and financial investment. These are: climate finance (n=3), green bonds (n=8), green economy (n=2), green finance (n=7), green funds (n=5), sustainable finance (n=18), sustainable investment (n=3), and sustainable practices (n=22). Full details of findings are available in Annex 11 of the report.

4.   Events and meetings

4.1.   TRADE Hub Indonesia kick-off workshop

The TRADE Hub Indonesia team presented a project kick-off workshop on 4 March 2020 in Jakarta entitled "Sustainable Trade: Palm Oil, Coffee, and Wild Species". The workshop was a platform for: launching the project; providing information on, and introducing TRADE Hub to relevant stakeholders; communicating the research framework and the results of scoping studies by the TRADE Hub team; collecting key discussion points and critical input from relevant stakeholders; and ascertaining various stakeholder perspectives regarding the issue of sustainable trade for palm oil, coffee, and wild species, and its potential role in supporting existing priorities, policies, and programs in Indonesia. The workshop involved 154 participants not including the invited speakers and CIFOR committee. Participants included representatives of academic/research institutions, business associations, consulting firms, financial institutions, government, independent experts, international agencies, journalists, NGOs/CSOs, and the private sector. Key stakeholders, such as the Deputy Minister for Food and Agriculture Coordination Affairs of the Coordinating Ministry for Economic Affairs, the

Head of the Forestry and Environment Research and Development Agency of the Ministry of Environment and Forestry, a representative for the Deputy for Trade and Industry Coordination Affairs, and many other key stakeholders played important roles as a resource-persons, discussants, or participants.

Figure 15. TRADE Hub Indonesia kick-off workshop (photo by CIFOR).

The workshop went well, and its objectives were achieved. Key stakeholders in the palm oil, coffee, and wildlife species trades in Indonesia were introduced to and welcomed the project. Most stakeholders showed support for the project, and hoped its findings and results will prove useful for resolving challenges and problems relating sustainable trading in Indonesia. The workshop also served as a communication and networking platform for the participants, where critical inputs from stakeholders were captured (see Table 10), and will become considerations for the final scoping study results, and for the implementation of project activities. The Indonesia research team hopes to establish a network and engage with stakeholders throughout the project process.

Table 10. Key input from the kick-off workshop.

Topics	Key inputs
Wild species trade in Indonesia: Online songbird trading (WP1)	- Needs to determine the scope of analysis, e.g. native species/non-native species, CITES list/not - Needs to specify the definition of songbird for filtering online surveys. Traders often use specific code for certain species - Important for impact is clear interventions such as behavior change (of traders), or improvement of policies on cyber-crime - Related to international trade, needs to work on policy harmonization at national and international level (CITES)

Topics	Key inputs
	- Buyer education is important - Needs to support wildlife trade traceability
Palm oil trade: Trade-off between economic benefits and impacts for people and the environment (WP2, WP3 – Oil Palm)	- Need to focus more on socioeconomic impacts, especially for independent farmers - Business model/case for independent smallholders holding less than 2 hectares of land - Need to determine how to leverage ISPO internationally - Need to evaluate ISPO implementation on the ground - Definition of sustainability - Direction of the research should address future expansion/ deforestation trends that may not be due to large plantations
Sustainability for smallholders: Research in West Kotawaringin district, Central Kalimantan province (WP2, WP3 – Oil Palm)	- To measure smallholder readiness for ISPO - To determine what needs to be done to ensure sustainable behavior can be adopted broadly, including in partnership models between the private sector and farmers - Specific for Central Kalimantan: productivity and legality issues for smallholders
Supporting No Deforestation Coffee Development (WP2 Coffee) **Sustainable Coffee Farming and Biodiversity Conservation: Research in Bukit Barisan Selatan National Park (BBSNP), Lampung (WP3 Coffee)**	- More awareness raising of the project needs to be carried out at provincial and district levels - Needs facilitation for farmers with a clear incentive mechanism - Low productivity of Robusta production, needs more engagement with academics, businesses, government and NGOs at national and global levels. Hopefully TRADE Hub can also engage at the international level in relation to price determination, which still depends on international pricing - Needs policy harmonization between multiple sectors and levels of government, both for agriculture and trade/exports - Needs to determine how to educate farmer groups and improve community economies in rural areas e.g. extension services - Needs to capture governance traceability issues - Sustainability issues at the supplier level e.g. small-scale farmers may have unsustainable practices, but are still supplying to committed corporate groups - Specific for West Papua: recommendation for custom-based business models - Link benefits of ISPO to achievement of SDGs - Scale of assessment to prove sustainability and convince the European market, especially for ISPO (should assessment be farm-based/country-based?)
Trade policies and economic impacts (WP4)	- Needs to recommend various government policy options or schemes to incentivize smallholder farmers - Needs to consider dynamics of trade policy, commodity competitiveness and infrastructure availability - Needs to develop analysis on scenarios that include extreme events e.g. occurrence of pandemic outbreaks - Needs to focus on business-to-business arrangements beside public policy on trade - Implications on trade policy and impacts from acceptability of ISPO in the global market
Modeling approach for sustainable trade policy study (WP5)	- Needs to establish a generic model that can be utilized beyond the project's scope, by commodity or area - Needs to consider an implementation framework for modelling approach recommendations - Needs to consider other key stakeholders; the house of representatives/parliament at national and sub-national levels - Needs to consider reinvestment of palm oil and coffee trade revenue e.g. fees from businesses

Topics	Key inputs
Development of capacity building methods in sustainable investment and trade for the palm oil and coffee industries (WP9)	- Needs to capture palm oil and coffee trade in the SDGs framework - Needs to encourage *geographic indication* for possible trademarking of Indonesian coffee - Needs to consider relationships between all stakeholders, not only the TRADE Hub project and its related stakeholders - Needs to consider trickle-down effects for oil palm and coffee smallholder benefits

4.2. West Papua Workshop

CIFOR, IPB, and the West Papua Food Crops, Horticulture and Plantations Office jointly presented a workshop in Manokwari, West Papua province on 9 February 2020 entitled "Sustainable Oil Palm Plantations and Presidential Instruction No. 6/2019: Towards Sustainable Palm Oil Trading." The workshop was held to support efforts being made by various stakeholders to establish sustainable oil palm plantation management in Indonesia. The government is currently perfecting the ISPO standard, and has issued two instructions imposing moratoriums on new licenses for areas of natural primary forest and peatlands, and is evaluating existing permits and increasing the productivity of existing oil palm plantations. In 2019, President Jokowi issued Presidential Instruction No. 6/2019 on the National Action Plan for Sustainable Palm Oil (RAN-KSB) for 2019-2024, which provides opportunities for strengthening plantation governance through aspects ranging from increasing grower capacity, environmental management and monitoring, and governance and conflict management, to ISPO certification and strengthening market access.

Expectations from the workshop included gaining an up-to-date understanding of plantation and industry progress in West Papua, including opportunities and challenges facing oil palm actors in regard to compliance with sustainability principles, as well as important issues relating to sustainable palm oil trading. In addition, it aimed to identify opportunities and challenges in implementing the ISPO standard and other sustainability schemes in West Papua, to anticipate the implementation of Presidential Instruction No. 6/2019 on RAN-KSB for 2019-2024 and the Manokwari Declaration on sustainable development in indigenous territories. It also aimed to identify important issues relating to policies and practices that drive sustainable oil palm plantation in West Papua in order to formulate co-research and solution designs.

Figure 16. Workshop on sustainable oil palm plantations in Manokwari, West Papua.

The workshop was opened by Dominggus Mandacan, the Governor of West Papua, followed by an opening address by Yacob S. Fonataba, head of the West Papua Food Crops, Horticulture and Plantations Office. The workshop was divided into four sessions. There were 85 participants including representatives of academic/research institutions, business associations, financial institutions, government, journalists, NGOs/CSOs, and the private sector. Speakers and participants gave critical contextual insights into, and progress reports on sustainable development in West Papua envisioned through the Manokwari Declaration and Presidential Instruction No. 6/2019. The TRADE Hub project's research focus is timely and highly relevant to issues in West Papua. The provincial government conveyed its appreciation to CIFOR for organizing the workshop, and welcomed contributions to West Papua's efforts to set a unique example on sustainable development and conservation with acknowledgement of indigenous peoples' roles. Key points from the workshop were as follows:

Sustainable development commitments and global trade in sustainable palm oil

- The central government's commitment to realizing sustainable palm oil is reflected by the recent issuance of Presidential Decree No. 6/2019 on the National Action Plan for Sustainable Palm Oil, as well as other policies aimed at ensuring sustainability for the sector.

- The West Papua Provincial Government is also committed to sustainable development, as laid out in the 2018 Manokwari Declaration.

- The provincial government is committed to not issuing new palm oil licenses, and instead, will optimize the roles of and benefits from existing licensed oil palm company concessions.

- Reconciling interests in economic growth and environmental conservation in Indonesia's oil palm sector is possible, and could be achieved through product intensification, land swap scenarios, incentivizing sustainable practices, etc.

Oil palm plantation and industry development in West Papua

- As specified in Minister of Agriculture Regulation No. 833/2019, plantation area in West Papua accounts for 58,000 ha, or only 0.36% of the total national plantation area (16.3 million ha).

- Several companies have adopted nucleus estate - plasma smallholder schemes covering a plantation area of 19,800 ha. The province has no officially recorded independent smallholders.

- The contribution of oil palm to West Papua was highlighted. It remains unclear how the sector and oil palm companies have contributed to regional own-source revenues, employment, local communities, etc.

- One ISPO certified company, PT Henrison Inti Persada, shared its experiences and lessons learned from its adoption of sustainability practices and securing ISPO certification. It acknowledged that securing ISPO certification was a challenge for oil palm companies as they would have to deal with 7 principles, 48 criteria and 133 indicators for sustainable palm oil during a long and time-consuming process being awarded a certificate.

Social impacts and the search for a model for indigenous community-based oil palm development

- The West Papua Provincial Government, as stated in the Manokwari Declaration, is committed to protecting the rights and roles of indigenous communities or *orang asli Papua* by recognizing their existence, cultural values, customary land and customary institutions.

- Despite commitments and efforts to protect indigenous communities, evidence from the field demonstrates that cases of indigenous communities losing their lands through forced transfers to investors still continue, and communities are no longer able to access their own lands once those lands become subject to company HGU business use licenses.

- Considering the need to enforce a West Papua special region regulation (*Perdasus*), a model for indigenous community-based oil palm development was proposed.

Needs for collaborative, multi-stakeholder and transdisciplinary approaches

- Given the complexity of the oil palm sector, all actors involved in palm oil supply chains need to engage in collaborative measures to strengthen the sector's governance, and to agree on sustainability measures they wish to implement and goals they wish to achieve.

- Transdisciplinary approaches would offer oil palm sector stakeholders in Indonesia in general, and West Papua in particular, equally positioned and holistic views for dealing with complex issues, and overriding the limits of disciplinary fragmentation. Such

approaches occur when participating stakeholders work jointly to create or implement a concept or practice and move beyond their discipline-specific approaches.

- Science and research are key to shaping Indonesia's palm oil sustainability agenda. They provide scientific input and guidance, and complement actors' efforts in implementing action plans.

- Stakeholders participating in the workshop welcomed CIFOR's plan to carry out research focusing on the palm oil trade (particularly in West Papua and Central Kalimantan), as well as the coffee and wildlife trades (in other provinces) through the collaborative UKRI-funded TRADE Hub project.

Follow-up actions

- As part of the TRADE Hub project, together with its research partners CIFOR will: (1) carry out stakeholder mapping; (2) develop a strategy for engaging stakeholders in project processes, particularly key local government, private, and financial actors concerned with oil palm commodities; (3) review existing work on levers of change and barriers relating to private sector action on sustainable trade, and review the prevalence, implementation and efficacy of corporate sustainability practices and disclosure policies in relation to trade in palm oil; (4) organize a series of meetings to explore implications of key research findings; and (5) facilitate multi-stakeholder dialogues on sustainable trade.

4.3. Stakeholder Consultations

TRADE Hub is a global project involving 50 partners working on specific issues in particular geographic areas. Using Theory of Change (ToC), the project expects its research to produce greater impacts beyond conventional research. In Indonesia, the project focus is on three commodities: oil palm, coffee and wildlife species. As a part of its activities, the Indonesia team started identifying key stakeholders to engage through its scoping study, existing network and a posteriori knowledge. The team then held stakeholder consultation with key stakeholders between December 2019 and February 2020. The objectives of these meetings were to inform key stakeholders, introduce them to the TRADE Hub project, and initiate engagement in order to gain their input, insights, and support, and to invite them to a project kick-off meeting as well as future events and activities.

Figure 17. Meeting with Deputy of Food and Agriculture Affairs under the Coordinating Ministry for Economic Affairs

Figure 18. Meeting with the Ministry of Trade's Trade Analysis and Development Agency.

Figure 19. Meeting with the MoEF Natural Resource and Ecosystem Conservation team.

The project held meetings with the Deputy of Trade and Industry Affairs, and the Deputy of Food and Agriculture Affairs under the Coordinating Ministry for Economic Affairs; the Trade Analysis and Development Agency under the Ministry of Trade; the Directorate General of Natural Resources and Ecosystem Conservation under the Ministry of Environment and Forestry; the Oil Palm Plantation Fund Management Agency (BPDKS); the Ministry of Home Affairs; and the Coordinating Ministry for Economic Affairs. A total of nineteen stakeholders holding high-tier positions in central government institutions were involved in these meetings between December 2019 and February 2020. Key points from these stakeholder consultations are listed below.

Issues surrounding sustainable development, and trade in general

- The focal points of the new National Medium-Term Development Plan (RPJMN) for 2020-2024 are economic growth and sustainability. Its green economy focus is challenging because most economic growth is highly dependent on natural resources utilization.

- The MoEF's Directorate General of Natural Resources and Ecosystem Conservation is focusing on the sustainable use of legally-sourced natural resources, and addressing illegal practices.

Issues surrounding palm oil

- The issue of oil palm plantations inside the forest estate is an important one to address. The Ministry of Environment and Forestry has the authority to make decisions regarding this issue.

- Replanting is a key activity with funding from the Oil Palm Plantation Fund. However, gathering reliable data on smallholders remains a challenge.

46

- A positive campaign for Indonesian CPO is necessary to increase its selling value in the domestic market.

- Challenges include the low level of competitiveness of Indonesia's product compared to Malaysia's, and global value chain requirements.

Issues surrounding coffee

- Coffee grading at the farm level remains an issue. Farmers need partnership schemes involving farmers and buyers.

Issues surrounding the wildlife trade

- There are 500 captive breeding facilities for birds.

- Tokay geckos were mentioned as important species in trade, especially for export.

- A major challenge encouraging illegal trade chains is the complicated procedures involved for legal trading.

The key stakeholders in central government welcomed the TRADE Hub Indonesia team and its research focus. The Coordinating Deputy of Trade and Industry Affairs under the Coordinating Ministry for Economic Affairs suggested the trade aspect of TRADE Hub is very much related to its own tasks and responsibilities. The Ministry of Trade indicated its support and willingness to share trade data and information. Key stakeholders from the Ministry of Environment and Forestry expect the project to contribute to science-based policy making. Participants involved in the stakeholder consultation provided useful input and insights for the project to commence its work on sustainability and trade issues. The project will continue its engagement with key stakeholders in government and other relevant institutions, to ensure important actors are kept informed and invited to participate in project processes.

5. Conclusion

The TRADE Hub Indonesia team has conducted scoping studies for each of the work packages. All topics in the work packages has been discussed and aligned with the country-level work plan and logical framework. They have also been discussed with global WP leaders and been consulted with the main team at UNEP-WCMC. We presented our findings at the project kick-off workshop, the workshop in West Papua, and in stakeholder consultation. We have commenced informing, engaging, and inviting key stakeholders to be involved in the project. Overall, the project has received positive feedback, as well as acceptance and appreciation.

Findings:

Work Package 1 focused on legal and illegal wildlife trade chains, providing information on songbird trading in Indonesia beyond available statistics.

Work Package 2 focused on palm oil and coffee. Existing conditions, actors, and policies have been identified.

Work Package 3 focused on the social impacts of agricultural commodity. Relevant literature on social impact of oil palm have been collected.

Work Package 4 focused on agricultural and wildlife trade policies in Indonesia. Framework as well as trade drivers and outcomes have been identified.

Work Package 5 focused on land-use models to support trade modelling. The Indonesia team has reviewed and has experience with various trade models expected to be useful for the project.

Work Package 6 focused on private sector solutions and impacts. The work package provides a comprehensive review of various commitments, initiatives, and standards, as well as assessments of efficiency and challenges.

Work Package 7 focused on public sector strategy and policy. Findings cover analyses of major policies and regulations governing natural resource management, biodiversity conservation, and the environment and how they relate to palm oil.

Work Package 8 focused on identifying and reviewing various web-based trade platforms. Findings show data gaps and potential partners to engage with in developing trade platforms.

Work Package 9 focused on capacity building internally as well as externally. Key actors and networks, and potential training activities have all been mapped.

Finally, we hope the data and findings collected in the scoping study can provide insights as well as a solid foundation for commencing TRADE Hub activities in Indonesia. Research gaps have been identified, as have plans and strategies for the successful implementation of project activities.

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Annexes

Annex 1 - Theory of change TRADE Hub Indonesia

Simplified version of theory of change TRADE Hub in Indonesia

GOAL
Global trade delivers benefits for Indonesia while reducing impacts to high-risk forested landscapes and their rural communities.

OUTCOMES

OUTCOME 1
Improved understanding of at-risk landscapes and associated supply-chain risks to guide sustainable production.

OUTCOME 2
Business cases for sustainable commodity production are demonstrated and adopted by rural communities in high-risk forested landscapes.

OUTCOME 3
Early-career researchers and professionals generate new knowledge for decision makers to better apply sustainability principles to commodity production and trade from high-risk forested landscapes.

OUTCOME 4
Indonesian fiscal and financial regulatory authorities adopt improved tools and products to support sustainable investment decisions on palm oil and coffee trade.

OUTCOME 5
Government regulators and private enterprises engaged in palm oil, coffee and wildlife commodity production and trade, to better incorporate sustainability information into decision making.

OUTCOME 6
Enhanced policies, planning and management result in improved economic and environmental sustainability.

OUTPUTS

ACTIVITIES

WP8: Innovation, technology, and *outreach*

WP7: Public sector solutions and impact

WP6: Private sector solutions and impact

WP0: Co-design and MEL (Monitoring, Evaluation, and Learning System)

WP5: Modelling trade scenarios

WP9: Capacity building, training, and network development

WP1: Wild species in trade

WP2: Domesticated species in trade

WP3: Social impacts

WP4: Trade policies and economic impacts

Detailed version of theory of change TRADE Hub in Indonesia

GOAL

Global trade delivers benefits for Indonesia while reducing impacts to high-risk forested landscapes and their rural communities.

OUTCOMES

OUTCOME 1
Improved understanding of at-risk landscapes and associated supply-chain risks to guide sustainable production.

OUTCOME 2
Business cases for sustainable commodity production are demonstrated and adopted by rural communities in high-risk forested landscapes.

OUTCOME 3
Early-career researchers and professionals generate new knowledge for decision makers to better apply sustainability principles to commodity production and trade from high-risk forested landscapes.

OUTCOME 4
Indonesian fiscal and financial regulatory authorities adopt improved tools and products to support sustainable investment decisions on palm oil, coffee and wildlife trade.

OUTCOME 5
Government regulators and private enterprises engaged in palm oil, coffee and wildlife commodity production and trade, to better incorporate sustainability information into decision making.

OUTCOME 6
Enhanced policies, planning and management result in improved economic and environmental sustainability.

OUTPUTS

1.1. National assessment of forest intactness and commodity threats to identify priority landscapes and sectors.

1.2. Case studies provide analysis of corporate exposure to risk at national and global level from deforestation within supply chains in selected landscapes.

1.3. Case studies provide analysis of legal and illegal wildlife trade along with its socioeconomic and environmental risks.

2.1. Smallholder farmer typologies are synthesized in order to derive and predict behavioral characteristics of commodity expansion and associated forest conversion in forested landscapes.

2.3. Define and develop successful business cases for sustainable commodity production in a forested landscape at high risk of conversion.

2.2. Analysis of barriers/opportunities to apply and scale up sustainable practices of existing smallholder coffee/palm oil production (including certification) in selected landscapes (at high risk of deforestation).

3.1. Research on trade, agriculture, environment and stakeholder engagement is conducted by a PhD student.

3.2. Training modules are provided and delivered through specific fora, building on findings from 4.1, 4.2, 2.1, 2.2, 6.1, 6.2, 5.2.

3.3. Project results are validated through publication in reputable journals related to project theme.

4.1. Fiscal policy, public and private sector financial tools, products, services, at district, provincial and national scales, which incentivize/disincentivize sustainable smallholder production are identified and evaluated.

4.2. Information developed to support fiscal and financial regulatory authorities to develop controls/incentives that guide sustainable investment decisions along supply chains of two important commodities.

5.1. Key targets for knowledge products are identified using stakeholder network analysis.

5.2. Knowledge products are created, which translate research results into policy and practice, from farm to national levels.

5.3. Knowledge products are disseminated to decision makers through existing fora (e.g. industry associations, policy fora and in the private sector).

5.4. The uptake of recommendations from knowledge products and stakeholder engagement into policies, practices or approaches (public and private sector) is monitored and recorded during project lifespan, based on project logframe.

6.1. Recommendations and policy options defined for improving sustainable smallholder agriculture, linked to results of 2.2.

6.3. Scenarios are prepared to assess social, economic and environmental trade-offs associated with different public and private policy options at the landscape and national levels.

6.2. Analysis of barriers and costs associated with the implementation of ISPO/RSPO sustainability standards for smallholders (linked to 4.1. and 2.2.) and private company.

6.4. Analysis of politics and power dynamics related to market and regulatory demands for achieving sustainable production of commodities in high-risk deforestation landscapes.

ACTIVITIES

WP0: Co-design and MEL

WP1: Wild species in trade

WP2: Domesticated species in trade

WP3: Social impacts

WP4: Trade policies and economic impacts

WP5: Modelling trade scenario

WP6: Private-sector solutions and impact

WP7: Public-sector solutions and impact

WP8: Innovation, technology and outreach

WP9: Capacity building, training and network development

TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

Songbird Trade in Indonesia:
Scoping from an Online Marketplace

Scoping Study Work Package 1 TRADE Hub Indonesia

Beni Okarda, Ahmad Dermawan, Usman Muchlish

Center for International Forestry Research (CIFOR)

Photo by Bob Silver/flickr

Full text available by enquiry, contact person: Sonya Dyah (s.dyah@cgiar.org)

TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

Overview of Oil Palm Development and Impact to Forest Landscapes in Indonesia

Scoping Study Work Package 2 TRADE Hub Indonesia

Sonya Dyah Kusumadewi, Herry Purnomo, Ahmad Dermawan

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Photo by CIFOR

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TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

Actor Analysis of the Palm Oil Governance in Indonesia

Scoping Study Work Package 2 TRADE Hub Indonesia

Sonya Dyah Kusumadewi, Herry Purnomo, Ahmad Dermawan

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TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

The Impact of Coffee Trade to Biodiversity and Deforestation In Indonesia

Scoping Study Work Package 2 TRADE Hub Indonesia

Lampung University and Wildlife Conservation Society

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TRADE, DEVELOPMENT &
THE ENVIRONMENT HUB

Social Impacts of Oil Palm Trade in Indonesia

Scoping Study Work Package 3 TRADE Hub Indonesia

Sonya Dyah Kusumadewi, Agus Andrianto, Herry Purnomo

Center for International Forestry Research (CIFOR)

2020

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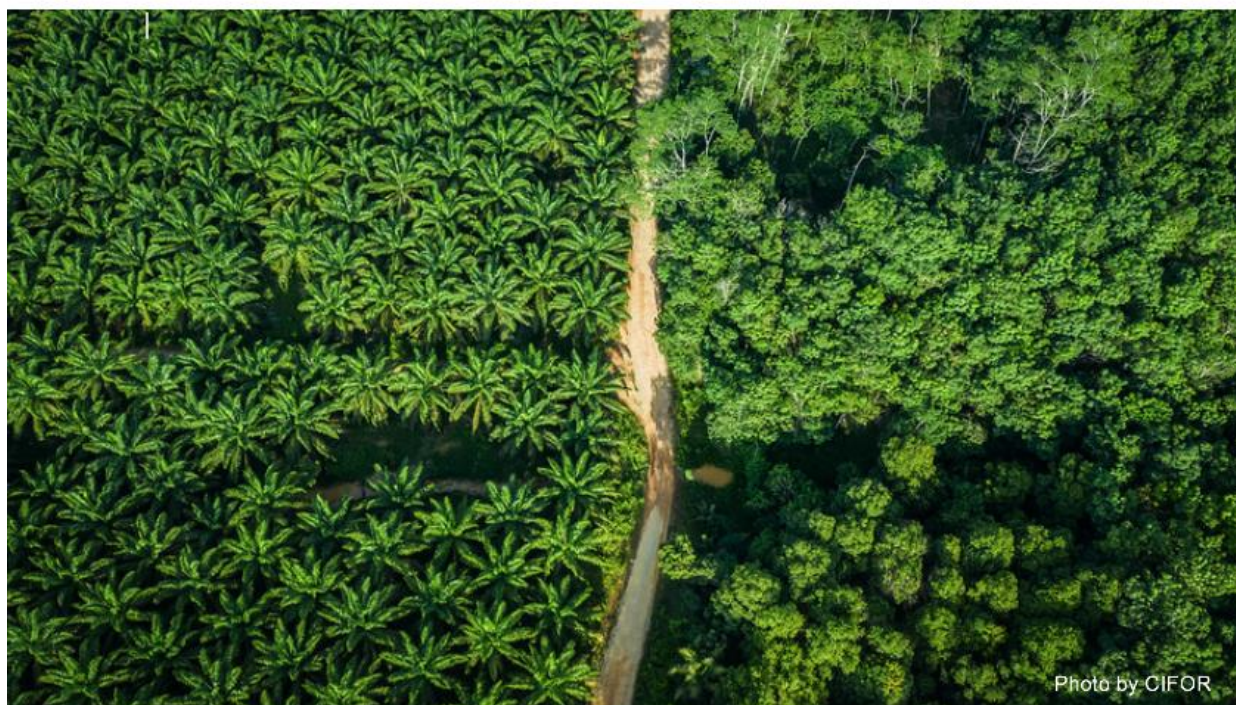Full text available by enquiry, contact person: Sonya Dyah (s.dyah@cgiar.org)

TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

Palm Oil Trade Policy and Wildlife Trade Chains in Indonesia

Scoping Study Work Package 4 TRADE Hub Indonesia

Sonny Mumbunan, Dewa Ekayana, Abdilla Alfath, Dhita Nabella

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TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

Land Use Modelling to Support Policy Scenarios for Rural Development at National and Sub-National Levels in Indonesia

Scoping Study Work Package 5 TRADE Hub Indonesia

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Full text available by enquiry, contact person: Sonya Dyah (s.dyah@cgiar.org)

TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

Corporate Sector Solutions and Impact (Country: Indonesia)

Scoping Study Work Package 6 TRADE Hub Indonesia

Heru Komarudin and Michael Brady

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Full text available by enquiry, contact person: Sonya Dyah (s.dyah@cgiar.org)

TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

Indonesia's Public Sector Strategy and Policies for Biodiversity Conservation Protection of Local People associated with Globally Traded Commodities (e.g. palm oil)

Scoping Study Work Package 7 TRADE Hub Indonesia

Heru Komarudin and Michael Brady

Center for International Forestry Research (CIFOR)

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TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

Innovation, Technology, and Outreach in Trade

Scoping Study Work Package 8 TRADE Hub Indonesia

Dyah Puspitaloka, Herry Purnomo, Andree Ekadinata

Center for International Forestry Research (CIFOR) and World Agroforestry Center (ICRAF)

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TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

Capacity Building

Scoping Study Work Package 9 TRADE Hub Indonesia

Suria Darma Tarigan, Iskandar Z. Siregar, Miftah Rahman, Ken Dara Cita

IPB University

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UKRI GCRF TRADE Hub
Research Workshop in Indonesia

Sustainable Trade: Palm Oil, Coffee, and Wild Species

Event Report

Center for International Forestry Research

March 2020

Full text available by enquiry, contact person: Sonya Dyah (s.dyah@cgiar.org)

Workshop

Strengthening the Governance of Plantations in West Papua towards Sustainable Palm Oil Trade

Event Report

Dyah Puspitaloka, Heru Komarudin and Sonya Dyah Kusumadewi

(Editors)

Center for International Forestry Research

2020

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16

Stakeholder Consultations

Meeting Report

2020

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TRADE HUB INDONESIA TEAM

- **End of the report -**