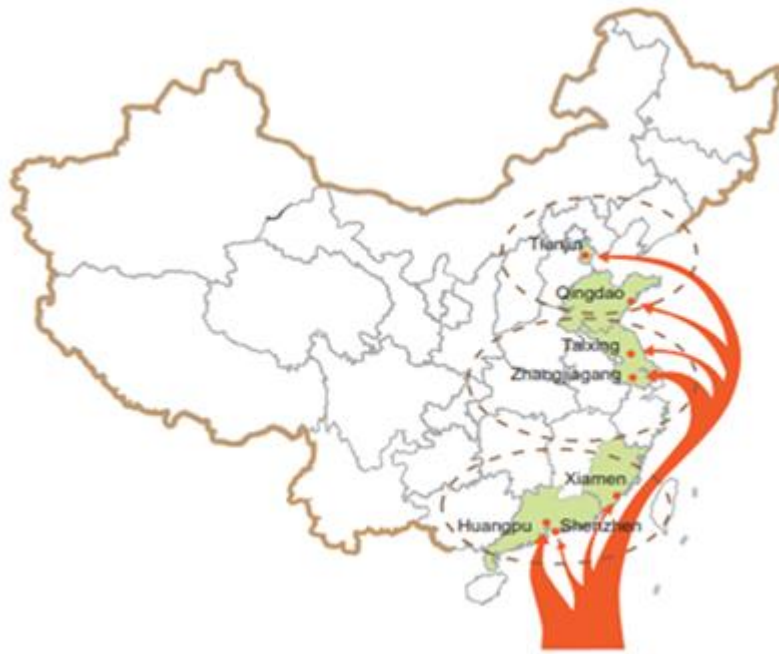


Sustainable Palm Oil: Trade and key players between Indonesia and China



proforest



Prepared by Segi Enam for Proforest and WWF Indonesia
Part 1: 18 October 2019, and part 2: 31 March 2020

Part 1

Abstract	3
Introduction	5
Methodology and Data	6
Methodology	6
Data	9
Limitations	11
Diagrams and Tables	12
1 Overview of the Indonesian Palm Oil Supply Chain	14
Production Basics	17
Overview of Indonesian Palm Oil Plantations	17
Summary of High-Risk Areas of Production	21
Environmental Risk Areas	22
Social Risk Areas	23
Overview of Plantation Ownership and Investment	27
Overview of Chinese Plantation Ownership and Investment	33
Key Sustainable Palm Oil Initiatives or Projects	35
Certification and Premiums	38
Other Supply Chain Basics	41
Trade Flow	42
Key Exporters and Importers	48
Estate and Smallholder Distribution	53
Supply Chain Initiatives	55
Key findings	58
Case Studies	61
Yihai Kerry (Wilmar China) & Wilmar International Limited	62
COFCO	64
Tianjin Julong	66
ZTE Agribusiness	67

References	68
Appendix A1: Wilmar’s Traceability Information on Palm and Laurics Products	69
Appendix A2: DCE Designated Delivery Warehouses (Tank Farms, Warehouses and Factory Warehouses) for RBD Palm Olein	71

Part 2

Baseline Mapping of Indonesia-China Sustainable Palm Oil Linkages

Introduction	74
Methodology and Data	73
Diagrams and Tables	77
1 Gender perspective	78
2 China trade deals and issues	83
3 Large plantation groups and China business connections	89
4 Indirect investment and Chinese capital flow to the Indonesian palm oil industry	92
7 RSPO premia and its drivers	96
8 Environmental and social risks in export regions	98
9 Trase data	106
10 Findings and recommendations	111
Recap of findings	111
Recommendations	115
References	117
Annex 1 - Clarification items	119
Annex 2 - SPOTT rating on gender	121
Annex 3 - China funding for selected plantations	123

Abstract

Part 1 of this report provides a baseline mapping study of Indonesia-China sustainable palm oil linkages. The linkages are investigated from several angles, from an overview of the trade relationship between Indonesia and China to a summary of key companies importing and exporting palm oil. The purpose of the report is to provide a comprehensive but concise overview of the relationship and stakeholders involved in the Indonesia-China trade of palm oil products. The study also includes an assessment of environmental and social risk areas as well as a summary of sustainability initiatives undertaken by Indonesia's largest plantation companies. In reviewing Chinese players in palm oil, some significant investors were identified; but the evidence points to stepwise progress, and the loss of large-scale investment ambitions. The study should serve as an important starting point for future research into more in-depth, location-specific linkages between Indonesia and China.

Part 2 of the report provides a deeper look into specific issues, including gender in palm oil, China trade issues and deals, and updates on Trase data for 2018.

Introduction

Palm oil is a versatile vegetable oil produced from the fruit of the oil palm tree. Originally from West Africa, oil is extracted from the pulp of the fruit as palm oil and from the kernel as palm kernel oil. Palm oil is used in a variety of ways, from commercial use in production of consumer goods such as soap and cosmetics and industrial lubricants, to food use as shortening, cooking oil, and margarine. Palm kernel oil is used exclusively in food production due to its lighter density.

This study focuses on the trade of palm products between Indonesia and China, covering the trade flows, key exporters in Indonesia, key importers in China, sustainability initiatives of producers and importer/end users, and a case study of key Chinese palm oil importers and refiners.

This study is critical due to the expansion of the Chinese economy and expected increase in demand for palm oil. The China Chamber of Commerce of Foodstuffs, Native Produce and Animal By-products (CFNA) estimates that palm oil demand in China will reach 8 million tonnes in 2020 and is likely to exceed 10 million tonnes by 2025. Uses of palm oil in China are generally limited to food, chemical, and industrial uses. In 2015, CFNA estimated that 4.3 million tonnes of palm oil (75% of China's total consumption) was used in food production. This was followed by 890,000 tonnes used in household chemicals (15% of total consumption) and 500,000 tonnes in other industrial applications (9%). In 2018, it was estimated that 57% of China's total consumption of palm oil was used in the food industry, and 43% was in industrial applications. Amongst them, palm oil consumption in the traditional food industry (instant noodles and leisure foods) is 1.3 million tonnes, accounting for 27% of total consumption, and that the modern food industry (Western fast food, baking, candy, chocolate, etc.) was also 1.3 million tonnes, accounting for 27% of total consumption. This was followed by 1 million tonnes consumed in the oleochemical industry (20% of total consumption) and 1.2 million tonnes used for the blending of oils and fats (25% of total consumption).¹

Palm oil has traditionally been used in non-food uses, primarily soap and detergents (using oleochemicals) and it is increasingly used for biodiesel. While some palm oil origin countries have blending mandates (including Indonesia and often pushed up when there is surplus palm oil), destination countries are less likely to mandate subsidies for imported palm feedstock. The palm oil industry frequently describes that biodiesel usage in China is on a voluntary basis and expands when palm oil feedstock price dips below the cost of gas oil.

¹CFNA, email interview with WWF China, Beijing, June 8, 2020.

Methodology and Data

Methodology

Module 1a: Overview of the Indonesian palm oil supply chain.

The study began with a high-level summary of the Indonesian palm oil supply chain from producer (plantation) to port, which may include millers, processors, refiners, and exporters. The summary should be used as a basic illustrative primer on the Indonesian palm oil supply chain.

Module 1b.1: Production basics.

The high-level summary provided in Module 1a is further supplemented by information on current Indonesian palm oil plantation areas by region (e.g. Sumatra, Kalimantan, Sulawesi, West Papua, latest year available is 2017) and distribution of planted areas by type from the Indonesian Department of Statistics' Palm Oil Statistics. Where available, information on yields and age of Indonesia's palm oil plantation sector was gathered from publicly available information.

Module 1b.2: Identify and provide a summary of high-risk areas of production.

Based on the production information, it is possible to identify key areas of high environmental and social risk. The identification of these high-risk areas is useful for stakeholders interested in understanding the impacts of their supply chains. To facilitate the identification of these risk areas, an indicative map of Indonesian oil palm plantations (from the World Resources Institute's Global Forest Watch database) is crossed with aboveground live woody biomass density maps (reflective of the spatial distribution of aboveground carbon) and the International Union for Conservation of Nature and Natural Resources' (IUCN) Red List maps for threatened terrestrial species. High environmental risk areas are identified based on the overlap and proximity of oil palm plantation areas to the 4th quintile of both maps. The threshold is set based on the risk of further environmental impact from oil palm plantations on high aboveground carbon and critical IUCN areas.

A similar exercise was conducted to identify areas of high social risk. The plantation map is considered together with a list of identified conflict areas from the Environmental Justice Atlas (EJA) and information on migrant concentrations in Indonesian provinces from BPS. Although social and labour mapping datasets are in their infancy (with limited coverage and flexibility), the authors hypothesise that labour migration can be used as a proxy for socioeconomic inequality and disruption in the form of labour rights issues. The EJA information provides an indication of areas where land conflict occurs (especially involving indigenous land rights) which are identified by researchers and activists in collaboration with local communities as a participatory community-led science project. Case studies are co-produced, and the information sourced from primary accounts, official reports, EIAs, interviews, and research. The EJA remains a work in progress.

Module 1b.3: Develop overview of plantation ownership and investment.

To further understand Indonesia's oil palm supply chain, the authors identified and summarised ownership and investment information of a selection of ten (10) large Indonesian oil palm companies. These companies were selected based on their significance and size (whether financial, operational, or by production area) within Indonesia's oil palm industry. Using public information of key investments, the authors can provide general guidance on the approximate cost of investment by hectare and general indicators of investments by unit of estate, mills, crushers, and refineries.

Module 1b.4: Overview of Chinese plantation ownership or investments.

A combination of desktop research and interviews with plantation experts aided the understanding of the role of Chinese ownership and investments in Indonesia's oil palm industry. Publicly available data from Reuters, China's Ministry of Commerce, WRI, and other sources were used to provide context to Chinese involvement in Indonesia's oil palm industry. The background information is enhanced by 12 interviews with Indonesian plantation specialists and specialists involved in Chinese agribusinesses.

Module 1b.5: Identify key sustainable palm oil projects.

Based on the sustainability reports and other sustainability disclosures (e.g. to RSPO or national stock exchanges), the authors were able to identify and summarise key past and current sustainable palm oil projects of the ten selected Indonesian oil palm companies identified in Module 1b.3. Selected sustainable palm oil indicators such as the company's RSPO certified area in hectares, number of RSPO certified mills, average GHG footprint, and membership in other sustainability groups (e.g. Palm Oil Innovation Group, China Sustainable Palm Oil Alliance) were also identified and summarised.

Module 1b.6: Identify cost of certification and premiums.

Based on a literature review, centred on the palm oil study for the EU Commission in 2018. This refers to a few reports and interview data for 2017 collated by the author of this paper; and updated via several interviews for this report.

Module 1c.1: Identify trade flow between key palm oil exporting ports and China.

Indonesia-China trade flow of palm products can be estimated using data from the International Trade Center (ITC) by UN Comtrade and Indonesia's Department of Statistics (BPS). Trade volume and value from key exporting ports in Indonesian provinces were sourced from BPS while a summary of export volumes and values for key palm products at the national level were sourced from ITC. HS codes identified for analysis are provided in Table A1.

Module 1c.2: Summary of key exports of palm oil to China and key Chinese importers/buyers.

Continuing with the use of ITC data, the authors identified a list of Indonesian companies exporting palm oil to China as well as key Chinese importers/buyers. The list of companies is supplemented with data from Trase, a commodity supply chain mapping tool. The list of companies is summarised based on estimated volumes and values and presented on an as-is basis.

Module 1c.3: Summary of estate and smallholder area distribution

A summary of Indonesia's estate and smallholder area distribution is derived based on BPS' Oil Palm Statistics (2016 latest year of finalised data, 2017 latest year of preliminary data). The summary is developed based on breakdowns of oil palm plantation types (government estates, private estates, and smallholders) across all Indonesian provinces.

Module 1d: Supply chain initiatives

A qualitative review of current supply chain initiatives related to China-linked sustainable palm oil was conducted based on a desktop review and 4-5 interviews with supply chain traders and Indonesia-China trade specialists.

Module 3: Case studies of key players and initiatives for Indonesia-China linkages

Several case studies were identified and developed based on the Indonesia-China linkages and sustainability initiatives for Wilmar and Julong based on publicly available information from corporate reports and traceability disclosures.

Table A1: List of Selected Palm Products Exported by Indonesia to China, 4-HS and 6-HS Codes

4-HS Code	6-HS Code	Product Description
3826	382600	Biodiesel and mixtures thereof
2306	230660	Oilcake and other solid residues (palm nut/kernel)
1513	151321	Crude palm kernel and babassu oil
1513	151329	Palm kernel and babassu oil and their fractions
1511	151190	Crude palm oil
3823	382370	Industrial fatty alcohols (vegetable or animal origin)
3823	382311	Stearic acid
3823	382312	Oleic acid
3823	382319	Other (palm kernel, coconut, palm)

Data: ITC for HS codes

Data

Key data sources used in this report are primarily from publicly available and official sources, supplemented with interviews with selected experts familiar with the Indonesia-China trade flows. A summary of the data sources used in this report is provided below.

Data	Source	Citation	Coverage Year	Links
Production and supply chain basics	CIFOR	Pacheco P, Gnych S, Dermawan A, Komarudin H and Okarda B. 2017. The palm oil global value chain: Implications for economic growth and social and environmental sustainability. Working Paper 220. Bogor, Indonesia: CIFOR.	2017	http://www.cifor.org/publications/pdf_files/WPapers/WP220Pacheco.pdf
Tree Plantations	WRI	Petersen, R., D. Aksenov, E. Goldman, S. Sargent, N. Harris, A. Manisha, E. Esipova, V. Shevade, and T. Loboda. 2016. "Mapping Tree Plantations with Multispectral Imagery: Preliminary Results for Seven Tropical Countries." Technical Note. Washington, DC: World Resources Institute.	2013-2014	www.wri.org/publication/mapping-treeplantations .
Aboveground biomass density	WRI	Woods Hole Research Center. Aboveground live woody biomass density	2000	https://data.globalforestwatch.org/datasets/8f93a6f94a414f9588ce4657a39c59ff_1
Red List - Amphibians, Mammals	IUCN	IUCN Red List Maps, March 2019	2017-2018	https://www.iucnredlist.org/resources/spatial-data-download
Environmental Justice Atlas	Environmental Justice Organisations, Liabilities and Trade (EJOLT)	Leah Temper, Daniela del Bene and Joan Martinez-Alier. 2015. Mapping the frontiers and front lines of global environmental justice: the EJAtlas. Journal of Political Ecology 22: 255-278	1950-2015	https://ejatlas.org
Migrant labour concentration	BPS	BPS, Migrasi Seumur Hidup	1971-2015	https://www.bps.go.id/dynamictable/2015/09/07%2000:00:00/855/migrasi-seumur-hidup-menurut-provinsi-1971-2015.html
Company information	Reuters	n/a	n/a	https://www.reuters.com/markets/stocks
Company investment information	Transformasi Untuk Keadilan (TUK)	TUK Publications	n/a	https://www.tuk.or.id/category/publikation/?lang=en
	Company	n/a	FYE18	n/a

	Statements			
Chinese plantation ownership and investment	Interviews	n/a	n/a	n/a
Sustainability efforts	RSPO	Annual Communications of Progress	n/a	https://rspo.org/members/acop
Cost of certification and premiums	European Commission	Mark Barthel, Steve Jennings, Will Schreiber, Richard Sheane, Sam Royston, James Fry, Yu Leng Khor, Julian McGill. 2017. Study on the environmental impact of palm oil consumption and on existing sustainability standards: For European Commission, DG Environment.	2017	http://ec.europa.eu/environment/forests/pdf/palm_oil_study_kh0218_208enn_new.pdf
	SEnSOR-RSPO	Petra Rietberg. 2016. Costs and benefits of RSPO certification for independent smallholders. SEnSOR-RSPO.	2016	http://www.sensorproject.net/sensor/wp-content/uploads/2015/04/Costs-and-benefits-ofRSPO-certification-for-independent-smallholders-FINAL.pdf
Exporting ports in Indonesia	BPS	BPS, Export Statistics	2014-2018	https://www.bps.go.id/
	Trase	Trase. Indonesia - Palm Oil ²	2013-2014	www.trase.earth
Export data for Indonesia	ITC	ITC. Trade Statistics	2014-2018	http://www.intracen.org/
	BPS	BPS, Export Statistics	2014-2018	https://www.bps.go.id/
Key Indonesian exporters and Chinese importers	ITC	ITC. Trade Statistics	2014-2018	http://www.intracen.org/
	Trase	Trase. Indonesia - Palm Oil	2013-2014	www.trase.earth
Palm oil area distribution by region	BPS	BPS. Palm Oil Statistics	2014-2017	https://bps.go.id
Supply chain initiatives	RSPO	RSPO. News and Events	n/a	https://rspo.org
	Interviews	n/a	n/a	n/a

² As of the close for Part 1 of the Final Report on 31 Jul 2019, Trase data was available for 2013 and 2014. Updated Trase data is contained in Part 2.

Sustainability initiatives	Company Statements	n/a	FYE18	n/a
Sustainability initiatives	Company Statements	n/a	FYE18	n/a

Limitations

- Some inconsistencies in values between ITC and BPS export data.
- Inconsistency between import and export values may be due to differences between categorisation of products between Indonesia and China, or intra-Chinese trade via Hong Kong.
- Inconsistency between Trase and ITC/BPS data due to differences in data sources and documentation. Trase documentation is based on bills of lading whereas ITC/BPS data is likely based on customs and official disclosures.
- Aboveground live woody biomass density data is from 2000, but due to its higher resolution (30m), it is preferred to NASA's Global 1-degree Maps of Forest Area, Carbon Stocks, and Biomass, 1950-2010, which has a resolution of 100km.
- Aggregate social impact data is limited and still in its infancy.

Diagrams and Tables

Table A1 List of Selected Palm Products Exported by Indonesia to China, 4-HS and 6-HS Codes.

Diagram 1a Simplified palm oil value chain from plantation to refinery

Table 1b.1-1 Summary of distribution of oil palm planted area (hectares) by region and category of estate, 2017 (latest year where verified official data is available).

Table 1b.1-2 Summary of distribution of oil palm planted area (hectares) by region and category of estate, 2019 (latest year where preliminary official data is available).

Diagram 1b-1 Production areas and yield by main producer countries in 2015 from IndexMundi data

Diagram 1b-2 Supply networks for palm oil from mills to refineries in Indonesia.

Diagram 1b-3 Oil palm plantations as share of total district area in 2013 (in %) based on information from the Directorate General of Estate Crops (2015)

Diagram 1b-4 Oil palm expansion in Indonesia by type of actor based on information from the Directorate General of Estate Crops (2015), final data to 2013 and estimated to 2015

Diagram 1b-5 Smallholder share of total oil palm areas by district in 2013 (in %) based on information from the Directorate General of Estate Crops (2015)

Diagram 1b.2-1a Map of IUCN Biodiversity Richness, Threatened Mammals, Birds (excluding seabirds), and Amphibians and Oil Palm Areas

Diagram 1b.2-1b Map of Aboveground Live Woody Biomass Density and Oil Palm Areas

Diagram 1b.2-2a Map of land conflict incidences in Southeast Asia

Diagram 1b.2-2b Map of concentration of migrant populations, by province

Diagram 1b.2-3a to 1b.2-3c RSPO Complaints cases data

Table 1b.3-1 Top companies in the Indonesian oil palm industry

Table 1b.3-2 Top oil palm companies by investments and financing

Table 1b.3-1 Financing by group (USD million)

Table 1b.5-1 Top oil palm companies by CPO production and sustainability indicators

Table 1b.6-1 RSPO premia and cost indicators (USD per tonne, May 2019 data)

Table 1c.1-1 Summary of Value of Indonesian Palm Exports to China, 4-HS Code, 2014-2018

Table 1c.1-2 Summary of Weight of Indonesian Palm Exports to China, 4-HS Code, 2014-2018

Diagram 1c.1-1a Value of China's palm oil imports from Indonesia, by product, 2018

Diagram 1c.1-1b China's consumption of edible palm oil, 1990/91-2015/16

Diagram 1c.1-1c China's consumption of edible palm oil, 1990/91-2015/16

Table 1c.2-1 Indonesia Key Regions & Ports to China Major Receiving Ports

Table 1c.2-2a Indonesia Key Ports and Exporters for China Palm Product Trade

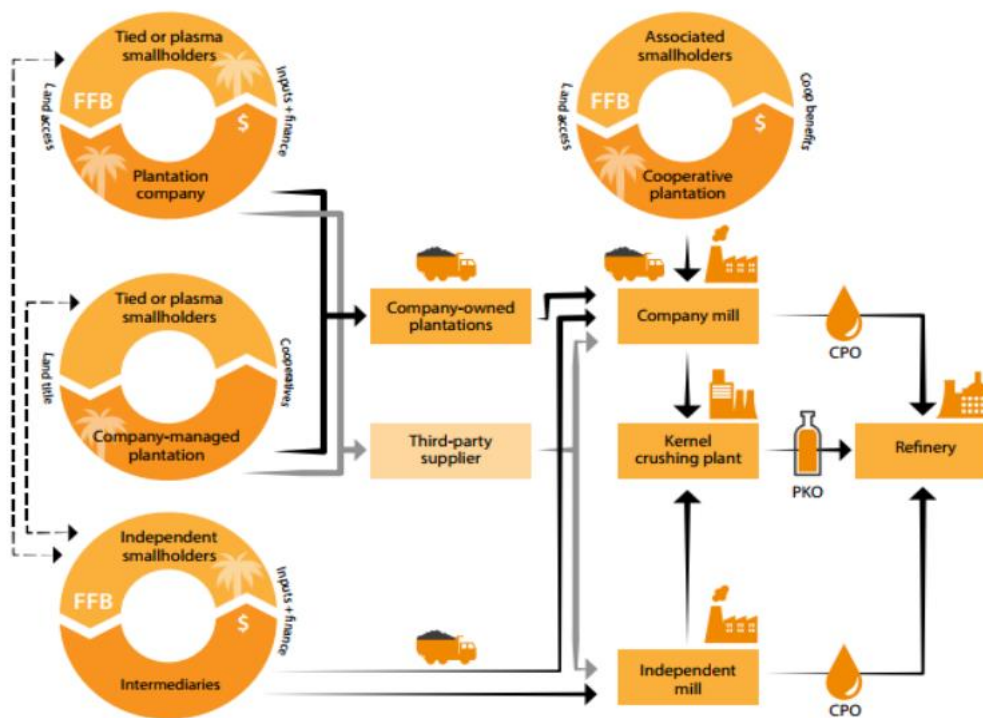
Table 1c.2-2b China Key Ports and Importers for China Palm Product Trade

Table 1c.3-1 Distribution of estates by type, region, and area, 2017

1a Overview of the Indonesian Palm Oil Supply Chain

The Indonesian palm oil supply chain starts with the producer (estates managed by plantation companies, their tied or plasma smallholders and independent smallholders) and ends at the port which moves the palm oil products (crude palm oil produced by mills, palm kernel oil produced by kernel crushing plants; and their refined products such as olein and stearin from refiner-processors) domestically and internationally. Mills and kernel crushing plants may also buy substantial amounts of fresh fruit bunches (FFB) of oil palm and palm kernels from third-party suppliers; this is especially so for independent mills that own little or no estates. The schematic below illustrates the value-chain and points to the refinery as the key point for export (and also sale of products domestically). It is also notable that Indonesia has a large domestic market with over 260 million population and an aggressive domestic biodiesel programme responsible for the consumption of the majority of palm oil produced in the country. As production area continues to expand, the USDA expects production volume to rise to an estimated 43 million tons in 2019/20, combined with rising domestic consumption. In 2019, GAPKI disclosed that while exports still dominated Indonesia's palm oil industry (80% of total production is exported), domestic biodiesel consumption rose 44% to 6.2 million kilolitres³.

Diagram 1a: Simplified palm oil value chain from plantation to refinery



Source: Pacheco et al. (2017)⁴

Key Findings

- The Indonesian palm oil supply chain starts with the producer (estates managed by plantation companies, their tied or plasma smallholders and independent smallholders) and ends at the port.

³<https://www.reuters.com/article/us-indonesia-palmoil/indonesias-2018-palm-oil-exports-rise-8-percent-gapki-idUSKCN1PV0PA>

⁴http://www.cifor.org/publications/pdf_files/WPapers/WP220Pacheco.pdf

- As production continues to expand on a strong increase in planted area, the USDA expects production volume to rise to an estimated 43 million tonnes in 2019/20, with domestic consumption holding at about 30% with its biodiesel mandate.

Indonesia biodiesel

In view of the concerns of the EU's rising de facto trade restrictions, Indonesia's domestic biodiesel outlook is pushing B30 (30% blending) ahead of its earlier 2020 target, up from B20 (20% blending) that had expanded coverage at the end of last year. Indonesian palm industry associations have said that the B30 trial will be completed in October (whilst some fuel user associations express doubts). Major findings include:

- For Indonesian biodiesel, the USDA^{5 6} estimated 4.6 million tonnes of CPO usage for 2018 (feedstock for fuel, for 5 million tonnes of biodiesel; with the B20 expansion) and 5.7 million CPO tonnes for 2019; up from 304,000 tonnes in 2009, 2.1 million tonnes in 2012 and 1.5 million tonnes in 2015.
- If successful, the government expects B30 to absorb about 7mil KL (6.1mil tonnes) of biodiesel in 2020. The Indonesia Biofuels Producers Association forecasts a stronger biodiesel consumption of 9mil KL (7.8mil tonnes) from B30.
- Looking ahead, the Indonesian Oil Palm Estate Fund or BPDP recently⁷ expects with B30, that the domestic market will absorb 9 million tonnes of CPO. BPDP reckons that a green fuel programme could even take up 25 million CPO tonnes in 2025; and is an opportunity to expand domestic absorption of CPO given the oversupply.
- USDA forecasts 2018/2019 palm oil production at 43 million tonnes, and domestic palm oil use of 13.1 million tonnes for 30% domestic absorption. Despite the demand from a young growing population and the biodiesel mandate push, the aggregate domestic usage ratio has been rather stagnant due to aggressive production increase. Some industry players have forecast domestic demand to reach over half of Indonesia's production in time to come.

⁵https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Indonesia%20Expands%20Biodiesel%20Mandate_Jakarta_Indonesia_9-18-2018.pdf.

⁶https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Oilseeds%20and%20Products%20Annual_Jakarta_Indonesia_3-15-2019.pdf

⁷<https://www.thejakartapost.com/news/2019/03/28/ri-to-accelerate-b30-program-in-anticipation-of-eu-restrictions.html>

China biodiesel⁸

Palm oil exporters have cherished hopes that China will import palm for its biofuels segment. Malaysia and Indonesia have talked to China about its B5 biodiesel programme but regional biodiesel traders have been skeptical: "Interesting, but a long shot as this would require China to pay a premium for B5 unless they are willing to subsidise." In September 2017, China's domestic focus was announced with biofuel ethanol E10 (10% fuel ethanol and 90% common gasoline blended) targeted at full scale by 2020, to help reduce mountains of ageing corn in state warehouses. Major points include:

- China biofuels policy focuses on domestic (corn) feedstock for E10 by 2020.
- Based on a 180 million kilolitres/year consumption of diesel fuel in China, the palm oil industry considers the potential of a B5 biodiesel policy that points to 9 million kilolitres (about 7 million tonnes of feedstock) per year; this potentially doubles palm imports of about 6 million tonnes recently⁹. But CFNA notes that biodiesel is not allowed to be used as "public oils" in China.
- But biofuels traders and Beijing chemical industry experts remain skeptical of large-scale imports of feedstock subsidised by Chinese consumers or the public purse.

⁸Based on an update of the author's preliminary review of China's biofuels policy in 2017, <https://www.linkedin.com/pulse/china-pushes-full-scale-bio-fuel-ethanol-e10-2020-yu-leng-khor-%E8%A8%B1%E5%B9%BC%E7%8E%B2/>

⁹CFNA (2020) points to the following data: palm imports in recent years have been 4.079 million tonnes in 2017, 4.316 million tonnes in 2018, 6.542 million tonnes in 2019, and 1.217 million tonnes from January to April 2020.

1b Production Basics

1b.1 Overview of Indonesian Palm Oil Plantations

In this report segment, we identify and summarise current Indonesian palm oil plantation areas by region (e.g. Sumatra, Kalimantan, Sulawesi, West Papua, based on official data), distribution of production areas (and information about yield), and production outlook.

Regionally, the majority of oil palm is planted in Sumatra and Kalimantan, which account for 59% and 35% of the total planted area respectively. In Sumatra, private estates and smallholders dominate, while in Kalimantan, the landscape is dominated by private estates with smallholders responsible for a smaller proportion of the planted area. As expected, average yields in Sumatra and Kalimantan are highest, as much as double the yield average of other regions such as Papua/West Papua. A full summary of the distribution of estate and smallholder area in 2017 and 2019 among Indonesia's regions can be found below:

Table 1b.1-1: Summary of distribution of oil palm planted area (hectares) by region and category of estate, 2017 (latest year where verified official data is available)

Region	Government Estates	Private Estates	Smallholders	Average Yield (T CPO/ha)
Java	21,448	7,375	8,856	2.02
Kalimantan	72,509	3,681,456	1,129,551	2.78
Lesser Sunda Islands	0	0	0	0
Sulawesi	25,692	253,743	250,653	2.34
Sumatra	492,768	3,662,527	4,225,908	2.72
Papua/West Papua	25,726	107,586	82,926	0.15
Grand Total	638,143	7,712,687	5,697,892	2.70

Source: Directorate General of Estate Crops. Area and average yield aggregated from provincial data.

Table 1b.1-1: Summary of distribution of oil palm planted area (hectares) by region and category of estate, 2019 (latest year where preliminary official data is available)

Region	Government Estates	Private Estates	Smallholders	Average Yield (T CPO/ha)
Java	21,364	7,843	9,689	2.18
Kalimantan	71,105	3,808,664	1,194,910	3.02
Lesser Sunda Islands	0	0	0	0.00
Sulawesi	25,379	27,293	258,235	2.32
Sumatra	490,788	3,873,132	4,398,217	2.94
Papua/West Papua	25,288	122,566	97,452	1.90
Grand Total	633,924	8,085,134	5,958,502	2.92

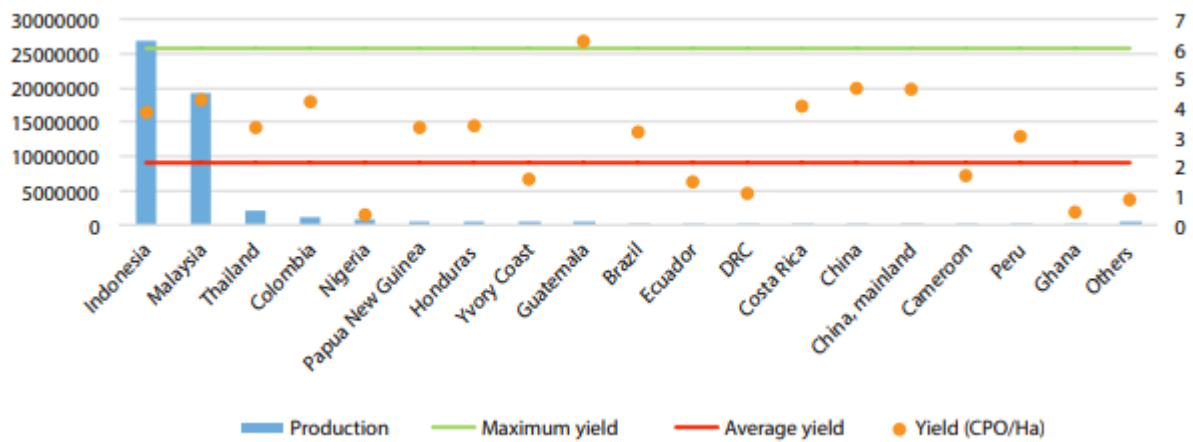
Source: Directorate General of Estate Crops. Area and average yield aggregated from provincial data.

Key facts. The charts below from Pacheco et al. (2017)¹⁰ illustrate the following points about Indonesia palm oil:

- Indonesia is the biggest palm oil producer in the world, and its yield slightly leads that of Malaysia, the second largest producer
- Refineries are in a number of locations, distributed across Sumatra (including on its west coast) and Kalimantan, in the northern tip of Sulawesi and focused in two zones of Java. Information about the supply networks of the biggest trader-processors GAR (green), Musim Mas (blue), Wilmar (orange) and Asian Agri (yellow) paint a complex web, especially for Wilmar.
- Oil palm is popular across the entire islands of Sumatra and Kalimantan. Oil palm is especially dominant in key areas of Sumatra (planted across 25-75% of certain regencies; including in North Sumatra, Riau and Jambi provinces), and it is significant (10-25% of regency areas) in selected parts of West, Central and South Kalimantan. It is also present (mostly under 10% of regency area) in parts of Sulawesi, West Papua, Papua and Java.
- The planted area of oil palm started to expand in the 1980s and took off in the late 1990s and boomed from about 2005. Starting with state-owned and private companies dominating the scene early on, the share of private companies is over 50% now and smallholders are a major force with 40% of planted areas.
- The share of smallholders is very notable in Sumatra, Sulawesi and in parts of Kalimantan (over 50% and even over 75% in many regencies).

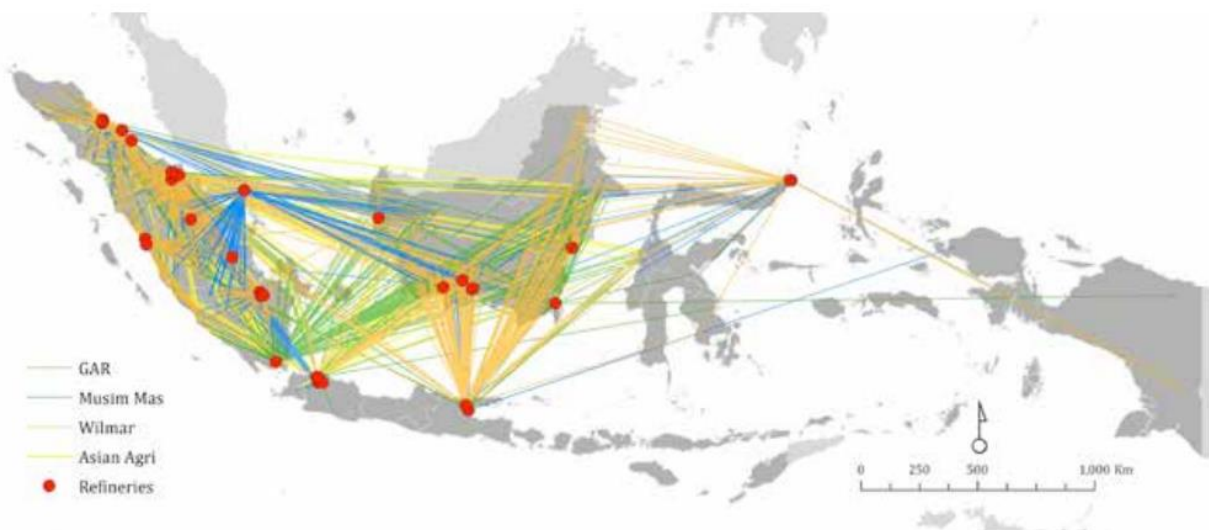
¹⁰http://www.cifor.org/publications/pdf_files/WPapers/WP220Pacheco.pdf

Diagram 1b-1: Production areas and yield by main producer countries in 2015 from IndexMundi data



Note: China has production efforts and plans for Hainan, Yunnan and Guangdong¹¹.

Diagram 1b-2: Supply networks for palm oil from mills to refineries in Indonesia.



Note: This information is preliminary and based on dashboards from companies and is provided for illustrative purposes.

¹¹http://www.xinhuanet.com/english/2017-11/18/c_136762665.htm, http://www.xinhuanet.com/english/2019-04/10/c_137965586.htm

Diagram 1b-3: Oil palm plantations as share of total district area in 2013 (in %) based on information from the Directorate General of Estate Crops (2015)



Diagram 1b-4: Oil palm expansion in Indonesia by type of actor based on information from the Directorate General of Estate Crops (2015), final data to 2013 and estimated to 2015

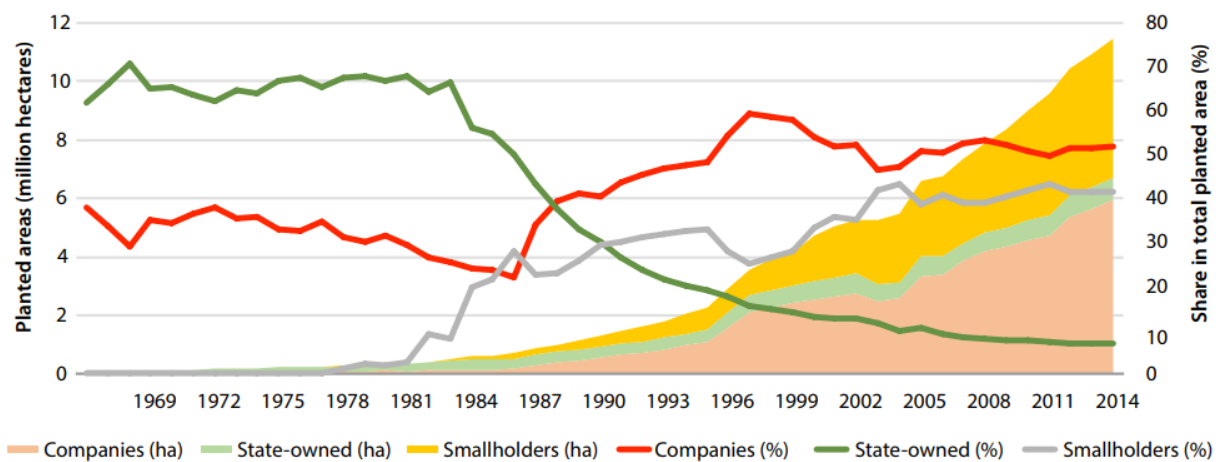


Diagram 1b-5: Smallholder share of total oil palm areas by district in 2013 (in %) based on information from the Directorate General of Estate Crops (2015)



Source: Pacheco et al. (2017)¹² Note: Refer to source document [here](#), for direct view of images cited above.

Major Findings

- The majority of Indonesian oil palm is planted in Sumatra and Kalimantan, accounting for 59% and 35% of total planted area respectively. In Sumatra, private estates and smallholders dominate, while in Kalimantan, the landscape is dominated by private estates with smallholders responsible for a smaller proportion of planted area.
- Yield averages in Sumatra and Kalimantan are highest, as much as double the yield average of other regions such as Papua/West Papua.
- Refineries are in a number of locations, distributed across Sumatra (including on its west coast) and Kalimantan, in the northern tip of Sulawesi and focused in two zones of Java. Information about the supply networks of the biggest trader-processors GAR (green), Musim Mas (blue), Wilmar (orange) and Asian Agri (yellow) paint a complex web, especially for Wilmar.

State-owned estates and smallholders:

2019 estimates for mature area and palm oil production reports 570,735 hectares under government estates with just over 2 million tonnes of CPO production; with this segment having a 5% share of Indonesia's area and production. This is based on Directorate General of Estate Crops reports and Badan Pusat Statistik data. The infocet does not offer breakdowns of smallholders by plasma and independents.

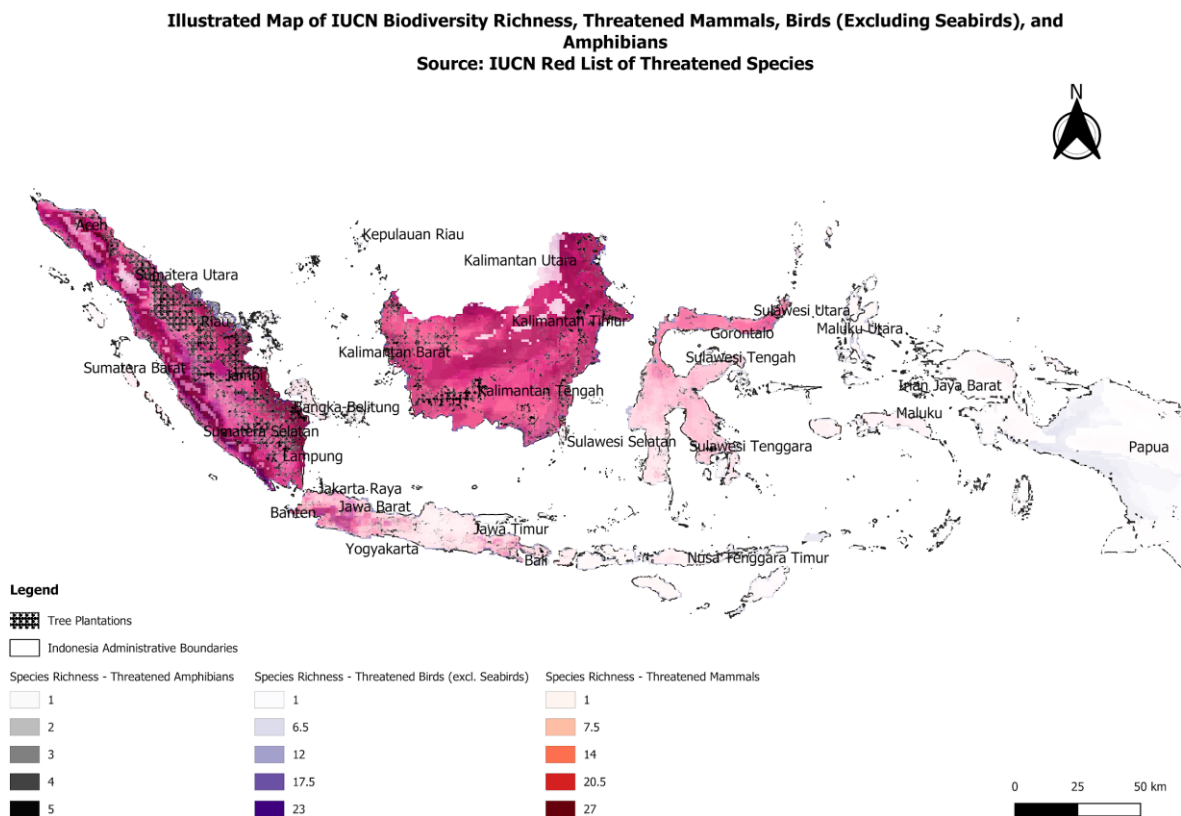
¹²http://www.cifor.org/publications/pdf_files/WPapers/WP220Pacheco.pdf

1b.2 Summary of High-Risk Areas of Production

Environmental Risk Areas

Environmental high-risk areas were identified using Woods Hole Research Center’s Aboveground Live Woody Biomass Density dataset (hosted on Global Forest Watch) and IUCN’s red list maps for threatened terrestrial mammals and amphibians. These indicators were selected due to historical and contemporary understandings of the environmental impact of the plantation sector on biodiversity of flora and fauna. Data from both maps was compared to existing plantation maps; plantations in or close to areas of high biomass density or number of IUCN threatened species (4th quintile) were flagged as high-risk areas.

Diagram 1b.2-1a, Map of IUCN Biodiversity Richness, Threatened Mammals, Birds (excluding seabirds), and Amphibians and Oil Palm Areas, [Larger image](#)

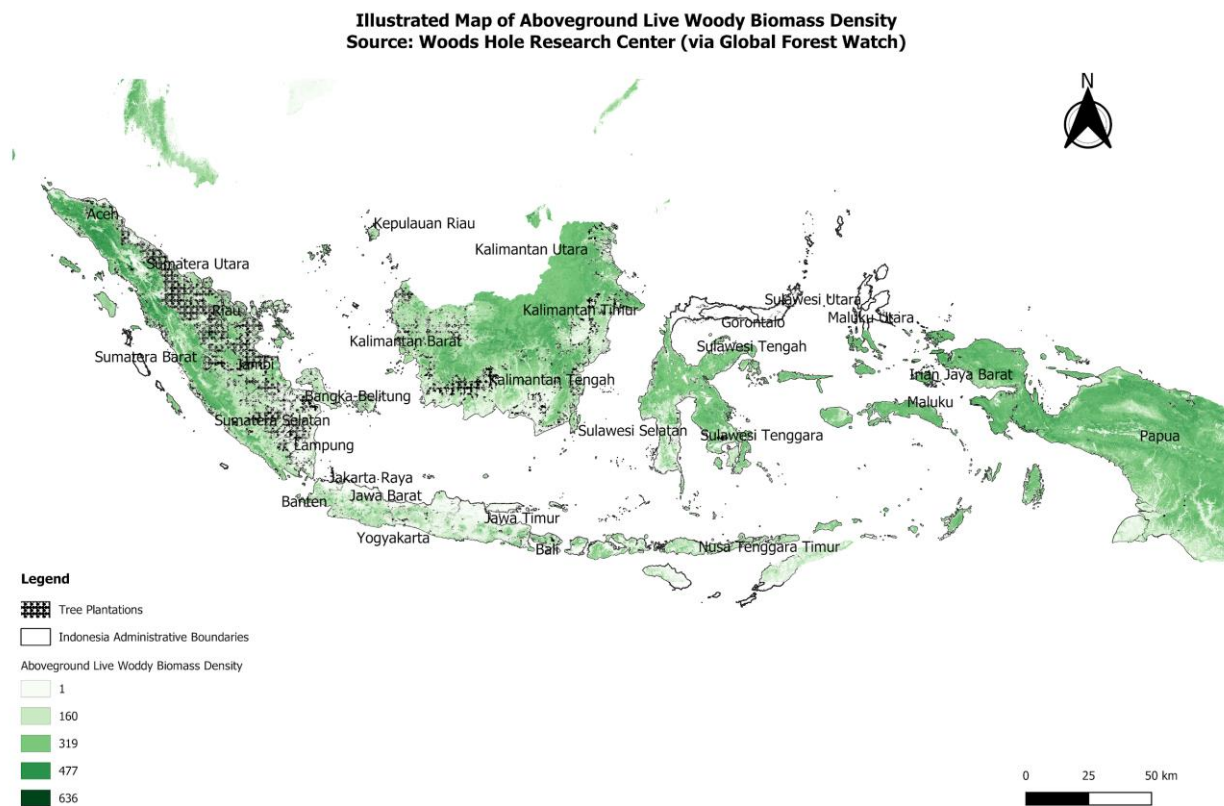


Note: Density of threatened amphibian species (light to dark grey), density of threatened bird species (excluding seabirds, light to dark purple), density of threatened mammal species (light to dark red), oil palm areas (square lines)

Source: IUCN Red List and author’s estimates

Diagram 1b.2-1b, Map of Aboveground Live Woody Biomass Density and Oil Palm Areas

[Larger image](#)



Note: Above ground carbon stock (light to dark green), oil palm areas (square lines)

Source: Woods Hole Research Center and author’s estimates

Overall, areas of high environmental risk (dark fuchsia) were found to be along Sumatra’s southwestern and northeastern coast due to a combination of high species density of threatened mammals and birds (excluding seabirds). This observation is also consistent with aboveground live woody biomass density data that indicate higher biomass density in Sumatra’s southwestern coast. The concentration of oil palm plantations in the western coast is low, although there are some scattered plantation zones containing oil palm plantations, especially in the provinces of Bengkulu and West Sumatra.

Therefore, the environmental risk along Sumatra’s northeastern coast is high due to significant concentrations of oil palm plantations, especially in the provinces of Riau, Jambi, and South Sumatra. At-risk areas are Bengkulu and West Sumatra - expansion of oil palm plantations in those provinces will encroach into areas with high density of threatened species and high aboveground live woody biomass.

High risk zones are also found in Kalimantan, with the majority of threatened species and aboveground live woody biomass density concentrated in the Heart of Borneo region, where there are currently no plantations, but where some encroachment has been observed (largely attributed to logging activity).

Social Risk Areas

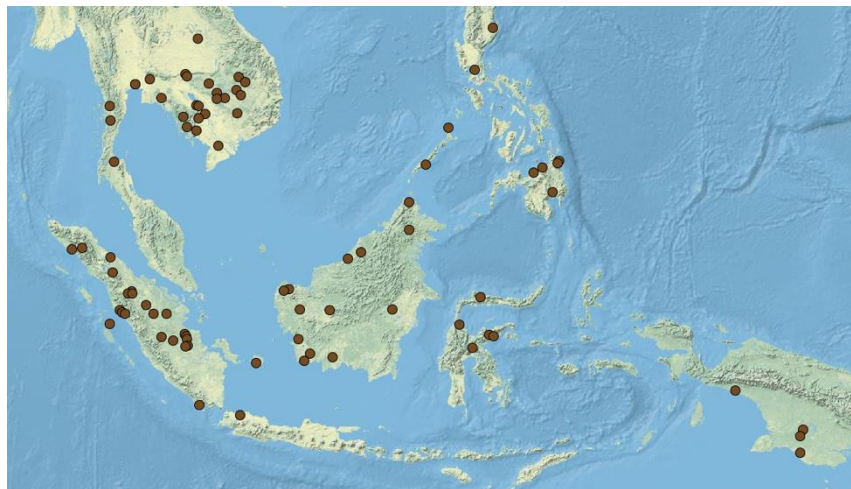
Social risks present a serious concern with regard to issues involving palm oil plantations. Overall, the

2018 RSPO Impact Report shows that concerns regarding human rights make up the third highest complaints received via the RSPO Complaints System throughout 2009-2018. This is followed closely by complaints involving labour issues.

Social risk data mapping appears to be in its infancy. Datasets have yet to be compiled. Some emerging sources are reviewed here. Key references for social issues include Amnesty International's report on labour¹³, Review of RSPO's key social policy on FPIC¹⁴, and RSPO complaint cases^{15 16}.

Some social high-risk areas are identified using the Environmental Justice Atlas (EJA, which tracks land conflicts, illegal logging, and other environmental and social conflicts related to land use).

Diagram 1b.2-2a Map of land conflict incidences in Southeast Asia



Data: Environmental Justice Atlas

BPS data on migrant labour concentrations, and RSPO Impact Reports are also reviewed. These indicators were selected due to historical and contemporary land rights and labour issues within the plantation sector.

General observations indicate that in Sumatra, social risk is highest in Riau and Jambi provinces, due to the higher percentage of in-migrants and concentration of EJA complaints. The majority of EJA complaints were categorised as land conflicts (conflicts between governments, companies, and local communities over land tenure and ownership) in Sumatra. In Kalimantan, the pattern diverges: the province of West Kalimantan had the higher number of EJA complaints, also in the form of land conflicts. However, the percentage of in-migrants was highest in East Kalimantan, followed by North and Central Kalimantan.

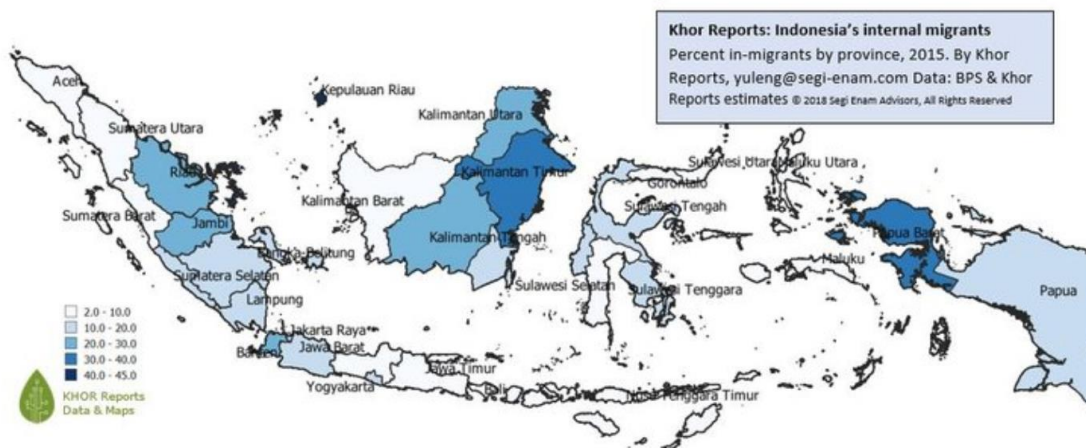
¹³<https://www.amnesty.org/download/Documents/ASA2151842016ENGLISH.PDF>

¹⁴<http://www.sensorproject.net/wp-content/uploads/2017/04/September-2016-Implementation-of-FPIC-does-this-reduce-conflict-.pdf>

¹⁵https://rspo.org/toc/RSPO-Impact-Update-Report-2017_221117.pdf

¹⁶<https://rspo.org/impacts>

Diagram 1b.2-2b Map of concentration of migrant populations, by province



Data: BPS data on migration

In both regions, large plantation companies were identified as counterparties to land conflict complaints by local communities: Wilmar and Sinar Mas/Golden Agri Resources and their subsidiaries were named most frequently, although smaller plantation companies were also found to play a role.

RSPO complaints reports show that social issues (labour, human rights, FPIC) form 61% of RSPO complaints and environmental issues (high conservation value) form 20% of complaints. Complaints peaked in 2013 and 2017, with the majority of all complaints originating from Indonesia (57%).

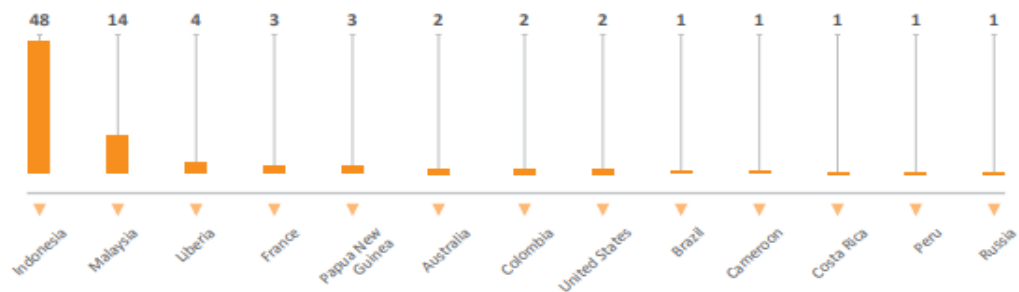
On RSPO's social policy and effectiveness¹⁷: *RSPO principles, criteria and procedures make reference to free, prior and informed consent (FPIC) in relation to plantation expansion and development of new plantations, and in relation to conflict resolution and compensation. Specific regulations on FPIC apply to uncertified operations of RSPO members... The lack of evidence of FPIC effectiveness is problematic, as addressing entrenched social conflict is one of the key challenges of the oil palm sector and central to the legitimacy of the RSPO. Independent empirical studies investigating FPIC processes, experiences with RSPOs FPIC guide, successful cases of implementation of FPIC, and comparison with cases without such implementation are needed, as well as enhanced efforts tackling the complexities associated with FPIC.*

¹⁷<http://www.sensorproject.net/wp-content/uploads/2017/04/September-2016-Implementation-of-FPIC-does-this-reduce-conflict-.pdf>

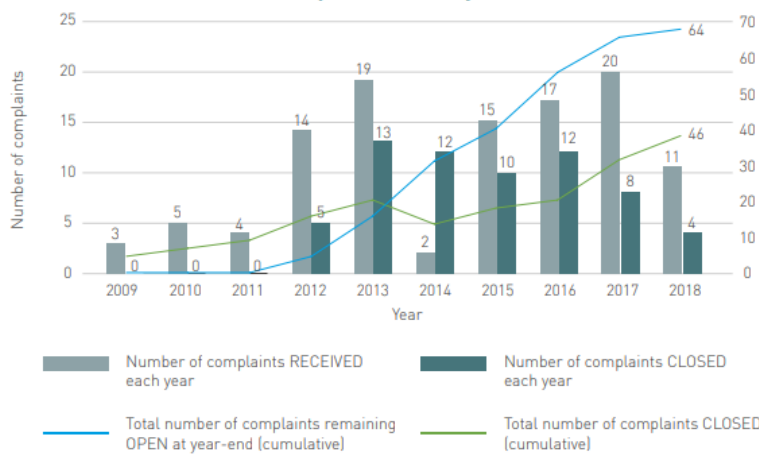
Diagram 1b.2-3a to 1b.2-3c RSPO Complaints cases data

Complaints by Country

(As at 30 June 2017)



Number of Complaints Cases by Year (2009–2018)



Note to data: Figures for 2009–2017 are representative of full calendar year (1 January–31 December). Figures for 2018 are inclusive up to 30 June 2018.

Nature of Complaints (2009–2018)



Note to data: As some of the complaints cases fall under more than one category, the data presented does not reflect the total number of official complaints cases received. Data is representative of 1 January 2009 up until 30 June 2018.

Source: RSPO Impacts Report 2017 and 2018

Major Findings

- Environmental high-risk areas in Sumatra are Bengkulu and West Sumatra - expansion of oil palm plantations in those provinces will encroach into areas with high density of threatened species and high aboveground live woody biomass. Social risk is highest in Riau and Jambi provinces due to the higher percentage of in-migrants and concentration of EJA complaints
- High risk zones are also found in Kalimantan, with the majority of threatened species and aboveground live woody biomass density concentrated in the Heart of Borneo region, where there are currently no plantations, but where some encroachment has been observed.
- RSPO complaints reports show that social issues (labour, human rights, FPIC) form 61% of RSPO complaints and environmental issues (high conservation value) form 20% of complaints. Complaints peaked in 2013 and 2017, with the majority of all complaints originating from Indonesia (57%).

1b.3 Overview of Plantation Ownership and Investment

From industry literature, knowledge and financial indicator rankings, 10 large plantation companies (entirely or majorly based in Indonesia) were selected for review. Notably including foreign-origin Wilmar, KL Kepong Berhad and Genting Plantations which have a large number of mills and/or hectareage. The table summarises ownership, and key indicators from financial websites and other publicly available sources; and it is ranked by CPO production.

Note especially that revenue for the “company” (listed group or private entity), may reflect diversified business income and is not revenue solely from CPO production. Notably, Wilmar is a global agribusiness with 25% of vegetable oil refining capacity in the world and has major business in cooking oil, sugar, flour and feed meal. Those with lower revenue compared to CPO production tonnage are likely those focused on palm oil upstream business.

Table 1b.3-1 Top companies in the Indonesian oil palm industry

	Business group	Other units include	Company	Stock exchange	Market Cap, May 2019 (USD mill)	FYE	Revenue, 2018 (USD mill, all business)	CPO production ('000 tonnes)
1	Sinar Mas	Golden Agri-Resources Ltd (PT Ramajaya Pramukti, GAR Iberia, Gemini Edibles & Fats India Private Limited, Golden Agri International Pte Ltd...PT Binasawit Abadipratama... PT Ivo Mas Tunggal... PT Sawit Mas Sejahtera...PT SMART TBK, PT SOCI Mas...); Sinarmas Cepsa Pte Ltd (PT Energi Sejahtera Mas, Sinarmas Cepsa Deutschland GmbH)	Golden Agri-Resources	Singapore	3,514	31 Dec 2018	7,167	2,436,000
2	Jardine Matheson	(Note: Not an RSPO member; linked to Kuala Lumpur Kepong via Astra-KLK Pte Ltd)	PT Astra Agro Lestari Tbk	Jakarta	1,403	31 Dec 2018	1,325	1,936,500
3	Wilmar	PPB Oil Palms (Sarawak, Malaysia), Yihai Kerry (China); Benso Oil Palm Plantation Ltd - BOPP POM, Bintulu Edible Oils Sdn Bhd, Cai Lan Oils & Fats Industries Co. Ltd. (Ha Long City), Kerry Oil & Grains (Tianjian) Ltd, Kerry Oils & Grains (Qingdao) Ltd, Kerry Specialty Fats (Shanghai) Co. Ltd, Lahad Datu Edible Oils Sdn Bhd, Lianyungang Huanhai Chemical Industries Co., Ltd, PGEO Marketing Sdn Bhd, PPB Oil Palms Berhad, PT AMP Plantation - AMP Palm Oil Mill,	Wilmar International	Singapore	16,406	31 Dec 2018	44,498	1,742,618

		PT Bumi Pratama Khatulistiwa Palm Oil Mill						
4	Raja Garuda Mas	Apical Group (AAA Oils & Fats Pte. Ltd., PT. Asianagro Agungjaya Marunda, PT. Asianagro Agungjaya Tanjung Balai, PT. Kutai Refinery Nusantara, PT. Sari Dumai Sejati); Asian Agri (PT. Inti Indosawit Subur, PT Hari Sawit Jaya)	Asian Agri	Private	n/a	n/a	n/a	1,052,473
5	Harita	(Note: associate of IOI Corp)	Bumitama Agri	Singapore	943	31 Dec 2018	582	1,043,045
6	Kuala Lumpur Kepong Berhad	Astra-KLK Pte Ltd, Bornion Estate Sdn Bhd, Davos Life Science Sdn Bhd, Equatorial Palm Oil Plc, Golden Yield Sdn Bhd, Gunong Pertanian Sdn Bhd, KL-Kepong (Sabah) Sdn Bhd... KLK Premier Oils Sdn Bhd, PT Adei Plantation & Industry, PT Alam Karya Sejahtera AKS..... PT Steelindo Wahan Perkasa, Taiko Plantations Pte Ltd, Uni-Agro Multi Plantations Sdn Bhd.	Kuala Lumpur Kepong	Kuala Lumpur	6,364	30 Sep 2018	4,423	999,981
7	Salim	(Note: Not an RSPO member) PT Salim Ivomas Pratama Tbk, PT Perusahaan Perkebunan London Sumatra Indonesia.	Indofood Agri Resources	Singapore	470	31 Dec 2018	976	921,000
8	Musim Mas	PT Musim Mas; Dutch Glycerin Refinery B.V., Intercontinental Oils and Fats Pte Ltd (ICOF), North Continental Oils & Fats Vietnam Company Limited, PT Agro Makmur Raya, PT Agrowiratama, PT Berkat Sawit Sejati..... PT Intibenua Perkasatama, PT Lestari Abadi Perkasa, PT Maju Aneka Sawit	Musim Mas	Private	n/a	2017	n/a	864,000
9	Surya Dumai	First Resources Trading Pte.Ltd., PT Adhitya Serayakorita, PT Arindo Trisejahtera, PT Borneo Ketapang Permai, PT Borneo Persada Energy Jaya, PT Borneo Surya Mining Jaya, PT Bumi Sawit Perkasa, PT Ciliandra Perkasa.	First Resources	Singapore	1,977	31 Dec 2018	462	823,679
10	Genting Plantations	Genting Biodiesel Sdn Bhd, Genting Biorefinery Sdn Bhd, Genting Musimmas Refinery Sdn Bhd, Genting Oil Mill Sdn Bhd., Genting SDC Sdn Bhd, SPC	Genting Plantations	Kuala Lumpur	2,002	31 Dec 2018	457	504,762

		Biodiesel Sdn Bhd						
A	Sime Darby Berhad	PT Minamas Plantation (Indonesia), New Britain Palm Oil (PNG).	Sime Darby Plantation	Malaysia	8,126	31 Dec 2018	1,573	2,652,935
B	IOI Corp	(Note: Linked to Bumitama Agri Ltd)	IOI Corporation	Kuala Lumpur	6,858	30 June 2018	1,783	757,949

Note: FYE is financial year end.

Data: Company reports, Reuters website, RSPO website for other unit names (please the website for a fuller list of unit names), the author's analysis.

For comparison, two large Malaysian plantation groups are also included; and it is worth noting that IOI Corp of Malaysia is close to Harita - Bumitama Agri, owning 32% of Bumitama Agri Ltd (having acquired a 33% stake in PT Bumitama Gunajaya Agro in 2007 for USD 63 million, which went for IPO on the Singapore stock exchange subsequently)¹⁸.

The table below summarises indicators for financing and investment of the same 10 large selected companies (ranked by indicative CPO production). Financing data is from the 'Forests & Finance' dataset, recent capital expenditure (capex) is from company reports and the listing of hectareage, mills, PKCs and refineries can be considered in relation to the following selected investment metrics (excluding land costs): i. the cost of replanting (about 3 years duration) is about USD3,900-4,300 per hectare (replanting is at the approximate rate of 5% of total hectareage each year for a typical plantation group), ii. a typical palm oil mill may cost USD9-12 million, iii. a palm kernel crushing (PKC) plant may cost USD13-15 million and iv. a refinery may cost USD 50 million¹⁹. Notably, ZTE Agribusiness, with a plan for upstream palm oil business of 100,000 hectares by 2020 (brownfield and greenfield), reported an investment plan of USD 1 billion in 2014²⁰.

¹⁸<https://www.theedgemarkets.com/article/ioi%E2%80%99s-bumitama-list-sgx>

¹⁹ Author's interviews with a senior financial analyst, a senior trader, a mill engineer specialist and a PKC-refinery equipment specialist.

²⁰<https://sawitindonesia.com/2020-zte-agribusiness-targetkan-kelola-lahan-sawit-100-ribu-ha/>

Table 1b.3-2 Top oil palm companies by investments and financing

	Company	CPO production ('000 tonnes)	Financing indicators(a), 2010-2018 (USD million)	Recent capex	Hectarage	No. mills	No. PKCs	No. refineries, total (and in Indonesia.)
1	Golden Agri-Resources	2,436,000	3,180	Projected 2019 capex of USD150mill, up from a projected USD110mill for 2018	606,168	45	9	6 (6)
2	PT Astra Agro Lestari Tbk	1,936,500	1,934	Capex of 2019 +9% from 2018's capex of IDR1.7trill/ USD117.5mill	290,892	31	14	3 (3)
3	Wilmar International	1,742,618	5,369	Projected 2019 capex of USD1.55bill versus USD1.3bill in 2017 and USD0.94bill in 2018	251,158	37	8	59 (13)
4	Asian Agri	1,052,473	350	n/a	161,890	19	8	5 (4)
5	Bumitama Agri	1,043,045	2,048	Projected capex of IDR1trill/ USD70mill for 2019	232,837	14	n/a	n/a
6	Kuala Lumpur Kepong	999,981	871	Projected 2018 capex of RM650 mill/USD155mill	280,472	24	3	4 (2)
7	Indofood Agri Resources	921,000	1,255	Analysts expect capex of Rp1.95trill/USD 135mill per year over the next three years	261,823	26	1	5 (5)
8	Musim Mas	864,000	50	n/a	194,204	16	2	17 (9)
9	First Resources	823,679	742	Projected capex of USD100mill for 2019 (vs about USD90mill in the past)	214,544	15	1	2 (2)
10	Genting Plantations	504,762	835	Capex of RM334mill /USD 80mill in 2018	247,655	11	n/a	1 (0)

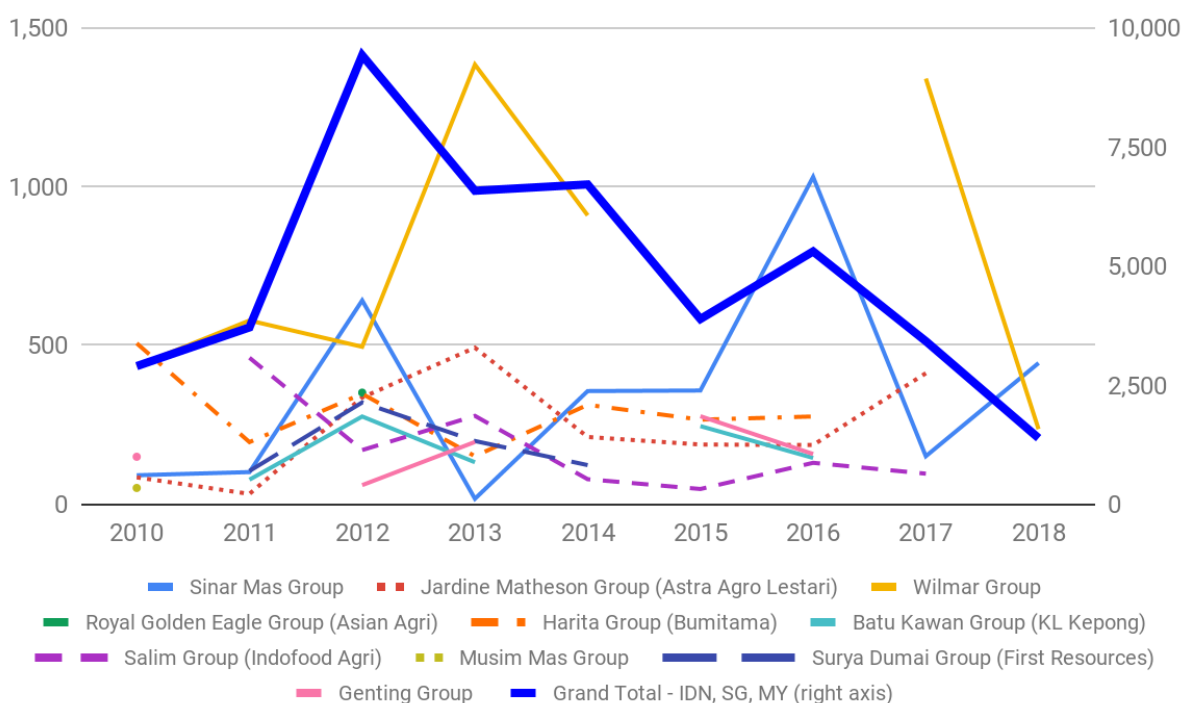
Data: Company reports, Forests & Finance, author's analysis.

Notes: (a) Bond issuance, corporate loan, revolving credit facility, share issuance from Forests & Finance dataset, accessed 13 May 2019.

Financing data from the 'Forests & Finance' dataset for palm oil groups of Indonesia, Singapore and Malaysia is presented by year for 2010 to 2018; totalling USD 43.2 billion during the 8-year period.

Financing information is limited for the private groups, RGE-Asian Agri and Musim Mas. Total financing for 60 groups covered in the dataset is shown for bond issuance, corporate loan, revolving credit facility, and share issuance peaked in 2012 at almost USD 9.5 billion and appears to have diminished to about USD 3.5 billion and USD 1.5 billion in 2017 and 2018; perhaps reflecting the internal cash generation abilities of these groups and possible inter-group financing. Wilmar International has the largest level of financing, ranging USD 0.5-1.3 billion per year in active years (2015-2017 inactive) and dipping lower in 2018. A 4Q2019 Wilmar China listing on the Shanghai Stock Exchange is anticipated to create the largest listed vegetable oil and food ingredient producer in terms of market capitalisation with USD 12-13 billion at its initial public offering or IPO²¹.

Table 1b.3-1 Financing by group (USD million)



Note: Bond issuance, corporate loan, revolving credit facility, and share issuance for selected groups based in Indonesia (IDN), Singapore (Singapore), and Malaysia (MY) and with plantation operations in Indonesia. The grand total refers to total financing (according to the aforementioned categories) for 60 plantation groups; and amounted to USD 43.2 billion (2010-2018).

Source: Author, Data: Forests & Finance website, accessed 13 May 2019.

Major Findings

- Sinar Mas, Jardine Matheson and Wilmar dominate the industry on a CPO production basis
- On a financing and investment basis, Wilmar International dominates, with projected 2019 capex of USD1.5 billion, followed by GAR's projected 2019 capex of USD150 million, and PT Astra Agro Lestari projected 9% growth on 2018 capex of USD118 million

²¹<https://sbr.com.sg/agribusiness/news/wilmars-china-unit-set-12-13b-market-cap-upon-shanghai-ipo-analyst>

- Total financing for 60 groups covered in the dataset is shown for bond issuance, corporate loan, revolving credit facility, and share issuance peaked in 2012 at almost USD 9.5 billion and appears to have diminished to about USD 3.5 billion and USD 1.5 billion in 2017 and 2018; perhaps reflecting the internal cash generation abilities of these groups and possible inter-group financing

1b.4 Overview of Chinese Plantation Ownership and Investment

This section presents an overview of Chinese plantation ownership or investments in Indonesia. Tianjin Julong Group's (Julong) plantation activity in Indonesia is best known, and their higher key presence (with large booths) at recent palm oil conferences is notable while ZTE Agribusiness has been relatively low key.

Despite past headlines about China-linked interest in palm oil and other farm million-hectare mega projects (e.g., 2006 Kalimantan Border Oil Palm Mega-project with an MOU signed by Artha Graha and Sinar Mas groups from Indonesia and the Chinese CITIC group and Chinese Development Bank among others²² and 2009 news of ZTE Agribusiness Company Ltd, a Chinese telecom equipment firm, planning to establish a one million hectare oil palm plantation in the Democratic Republic of Congo but scrapped due to logistics problems), sources and publicly available information points to more step-by-step outcomes and otherwise limited activity of Chinese interests in (relatively capital intensive) palm oil plantation ownership and investment. (And see news alert on durian fruit plantations below as the latest 'hot topic'.)

Key facts about Chinese palm oil sector investments is as follows (refer to Part 3a for more):

- Julong. The Julong Indonesia website²³ explains that the group developed its oil palm plantation in 2006 and a supporting crushing plant (palm oil mill) in 2011 in Kalimantan. So far, plantations of 50,000 hectares have been developed, and there is a reserve land bank of 140,000 hectares. When its first palm oil mill in South Kalimantan came into production in January 2011, it was the first ever owned by a Chinese enterprise. With 60,000 hectares of oil palm, Julong's estates and cooperating companies may produce over 200,000 tonnes of palm oil each year (assuming 3.5 tonnes of CPO per hectare).
- ZTE Agribusiness. ZTE's Zonergy website writes in Dec 2018 of the ZTE Energy Palm Park project in Central Kalimantan: operational with an 8,000-hectare estate and a palm oil mill; and a 150,000-hectare land bank in Papua. The company targeted 50,000 hectares in 2015 and 100,000 hectares by 2020; with an investment plan of USD 1 billion, USD 100 million has been spent. Assuming 50,000 hectares of oil palm, ZTE may produce about 175,000 tonnes of palm oil each year (estimating 3.5 tonnes of CPO per hectare).

Interviews with senior plantation specialists, including those in the Indonesian palm oil supply chain (within the large plantation groups and the key trade association) and those involved with Chinese agribusiness corroborate the finding of limited direct investment in the palm oil value chain. The feedback from sources²⁴ point to Julong and Zonergy-ZTE Agribusiness, their limited corporate headquarter-level interaction with the key regional industry players; and both are not current members

²²https://friendsoftheearth.uk/sites/default/files/downloads/palm_oil_mega_project.pdf

²³<https://julongindonesia.com/about.html>

²⁴In May-Jun 2019, 12 sources were interviewed by the author, including those based in Jakarta, Singapore, Hong Kong, Shanghai and Beijing.

of the RSPO.

China-based sources note that other Chinese investors likely “got burnt” and Jakarta observers note that Korean investors have been more successful, perhaps because they have been operating in Indonesia for a longer period (in the timber sector). Plantation specialists note that Chinese operators often employ Chinese nationals as plantation managers; and these companies may face the tight cash flow situation that characterises young estates setting up new mills. In contrast to the apparently limited direct participation of Chinese interests in Indonesia palm oil, the large Indonesia-China trade is notable and described in other sections of this report.

Indeed, despite early hopes, agriculture does not usually feature among the top 10 sectors of Chinese greenfield FDI in different regions²⁵, and observers of merger and acquisition (M&A) deals in Chinese agribusiness point more to the focused global and domestic expansion of state-owned enterprise COFCO’s trading and processing role (than asset-heavy and often domestic regulation-restricted investment in farmland). ZTE’s experience in agribusiness points to problematic costs arising from logistics, licensing, security, and compensation claims²⁶.

Major Findings

- Tianjin Julong Group’s (Julong) plantation activity in Indonesia is best known, and their higher key presence (with large booths) at recent palm oil conferences is notable while ZTE Agribusiness has been relatively low key.
- Despite past headlines about China-linked interest in palm oil and other farm million-hectare mega projects, sources and publicly available information points to more step-by-step outcomes and otherwise limited activity of Chinese interests in palm oil plantation ownership and investment
- Despite early hopes, agriculture does not usually feature among the top 10 sectors of Chinese greenfield FDI in different regions.

News alert - Chinese interest in durian fruits and its palm oil linkages

The most recent news is about Chinese investor interest in durian fruit agribusiness in the region; amidst the existing dominance of Thailand as durian supplier to Hong Kong and China in a trade rising toward USD1.5 billion per year, with a focus on the formalised export of Malaysia durian whole fruits at present²⁷. Notable deals include PLS Plantation Bhd’s (controlled by property tycoon, Lim Kang Hoo) joint venture with Shanghai-based Greenland Group which in March 2019 signed deals with four Chinese fruit distributors (Shanghai Yuandi International Trading Co Ltd, Shanghai Supply Chain Management Co Ltd, Shanghai Haoyuan Food Co Ltd, and Shanghai IVC Sun Supply Chain Management Co Ltd). PLS Plantations cultivates approximately 12,000 hectares of oil palm in Johor²⁸. Also in this partnership is Malaysia government-linked palm oil giant, FGV Holdings Bhd. FGV has identified 1,398 ha of land

²⁵ UNCTAD’s World Investment Report 2018, https://unctad.org/en/PublicationChapters/wir2018ch2_en.pdf

²⁶ <https://sawitindonesia.com/2020-zte-agribusiness-targetkan-kelola-lahan-sawit-100-ribu-ha/>

²⁷ <https://www.scmp.com/week-asia/opinion/article/3008935/malaysia-ramps-its-durian-exports-china-quirky-product-offerings>

²⁸ <https://www.malaymail.com/news/money/2019/03/31/more-durians-heading-for-china-with-four-new-deals-says-pls-plantations/1738332>

(within its commercial palm oil estates) that is potentially suitable for the large scale commercial planting of durian²⁹.

Implication: It is anticipated that many palm oil interests are and will try to participate in the durian fruit business, and Chinese business is expected to invest in processing at origin, and help to expand the supply chain and marketing within China beyond its first tier cities. Malaysia's target in the next few years is to double its durian exports from a low base. While conversion from oil palm and other agriculture is not controversial, some linkages to deforestation for durian has emerged.

Note: Indonesia has also expressed interest in developing its durian plantation and export business, with President Jokowi in March 2019 telling oil palm tree growers to turn to durian for better prospects (than palm oil) in the international market³⁰.

1b.5 Key Sustainable Palm Oil Initiatives or Projects

To identify the key sustainable palm oil projects of the 10 large selected plantation companies identified, this review summarises information from company disclosures to the Roundtable on Sustainable Palm Oil (RSPO), the Palm Oil Innovation Group (POIG) and the China Sustainable Palm Oil Alliance. Indonesia Sustainable Palm Oil or ISPO is a mandatory certification and not reviewed here.

About the key sustainable palm oil initiatives:

- The Roundtable on Sustainable Palm Oil (RSPO) is a multi-stakeholder institution, responsible for setting industry benchmarks for best practices and enforcing standards in sustainability.
- The Palm Oil Innovation Group (POIG) 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), and creating and promoting innovations. Founded in 2013, the initiative was developed in partnership with leading NGOs as well as with progressive palm oil producers.
- The China Sustainable Palm Oil Alliance (the Alliance) was jointly launched by the Roundtable for Sustainable Palm Oil (RSPO), China Chamber of Commerce of Foodstuffs and Native Produce (CFNA) and World Wildlife Fund (WWF) to create a platform for win-win cooperation among the stakeholders in the palm oil supply chain and promote sustainable palm oil in China. It was launched at the 2018 China Sustainable Palm Oil Supply Chain Forum & The Second RSPO China Forum (the Forum) held in Nanjing, China on 11 July.

Other sustainability initiatives are: (i) the Decent Rural Living Initiative, which aims to improve the protection of human and labour rights in agriculture; (ii) the Fire Free Alliance (FFA), a voluntary multi-stakeholder group formally launched in March 2016 consisting primarily of forestry and agriculture companies, together with Civil Society Organisations and other concerned partners keen to resolve the issues of persistent fires and haze arising from land burning; other founding members of the FFA include APRIL Group, Asian Agri, IDH, PM.Haze, Rumah Pohon, and Wilmar; (iii) the Palm Oil & NGO (PONGO) Alliance, founded in 2015 and officially launched in June 2017; its mission is to support the management of orangutans and other wildlife within oil palm landscapes; (iv) the Tropical Forest Alliance (TFA), a global public-private partnership whereby partners take voluntary actions—individually and in

²⁹<https://www.thestar.com.my/business/business-news/2019/04/30/fgv-locates-durian-land/>

³⁰<https://www.thejakartapost.com/news/2019/03/20/jokowi-tells-oil-palm-tree-growers-to-turn-to-durian.html>

combination—to reduce the tropical deforestation associated with the sourcing of commodities such as palm oil, soy, beef, and paper and pulp.

In terms of RSPO certification of mills, the leads are Asian Agri, Musim Mas, Kuala Lumpur Kepong, and Golden Agri-Resources. The average GHG footprint is based on reports to the RSPO and ranges from 0.90 to 3.39 tCO₂e/tCPO. Membership of POIG that extends RSPO commitments is Musim Mas and it is also a member of the China Sustainable Palm Oil Alliance, alongside Wilmar (via Yihai Kerry). Astra Agro Lestari is not a member of the RSPO, and Indofood decided to withdraw from RSPO certification in Jan 2019³¹.

Table 1b.5-1 Top oil palm companies by CPO production and sustainability indicators

	Company	CPO production ('000 tonnes)	No. mills	RSPO (no. mills certified)	% RSPO certified mills	Average GHG footprint (tCO ₂ e/ tCPO)	Palm Oil Innovation Group	China Sustainable Palm Oil Alliance
1	Golden Agri-Resources	2,436,000	45	29	64%	1.64		
2	PT Astra Agro Lestari Tbk	1,936,500	31	0	0%	n/a		
3	Wilmar International	1,742,618	37	20	54%	2.23		yes (Yihai Kerry)
4	Asian Agri	1,052,473	19	18	95%	2.81		
5	Bumitama Agri	1,043,045	14	5	36%	1.48		
6	Kuala Lumpur Kepong	999,981	24	19	79%	2.31		
7	Indofood Agri Resources	921,000	26	11	42%	1.62		
8	Musim Mas	864,000	16	12	75%	3.39	yes	yes
9	First Resources	823,679	15	0	0%	0.90		
10	Genting Plantations	504,762	11	4	36%	2.46		

Data: Company reports (mainly ACOP 2017 report submissions to the RSPO), POIG website, and China Sustainable Palm Oil Alliance³²

³¹<https://www.foodnavigator-asia.com/Article/2019/01/30/PepsiCo-responds-with-disappointment-at-Indofood-s-withdrawal-from-RSPO-over-disputed-audit-decision>

³²<https://rspo.org/news-and-events/news/rspo-launches-china-sustainable-palm-oil-alliance-with-cfna-and-wwf>

Major Findings

- In terms of RSPO certification of mills, the leaders include Asian Agri, Musim Mas, Kuala Lumpur Kepong, and Golden Agri-Resources
- The average GHG footprint is based on reports to the RSPO and ranges from 0.90 to 3.39 tCO₂E/tCPO.
- Membership of POIG that extends RSPO commitments is Musim Mas and it is also a member of the China Sustainable Palm Oil Alliance, alongside Wilmar (via Yihai Kerry). Astra Agro Lestari is not a member of the RSPO, and Indofood decided to withdraw from RSPO certification in Jan 2019.

1b.6 Certification and Premiums

This review focuses on the cost and premium for compliance with the RSPO Principles and Criteria for its major product, CSPO, and the added cost and issues for both plantations and smallholder suppliers. The major finding of a regressive cost structure (relatively high unit costs for smallholders) is consistent across various studies. The other cost is for supply chain certification by processors and traders and relates to certification premia for stearin and palm kernel oil. Source interviews in May 2019 found that premia prices for CSPO were holding up for mass balance (MB) and identity preserved / segregated (IP/SG) categories, but premia for stearin have fallen significantly, and CSPKO have nosedived (except for segregated or SG material). The benchmark CSPO book & claim (B&C) has fallen further but large plantations may be squeezing a margin on current costs. But under the more rigorous RSPO P&C 2018 (implemented from Nov 2019) the new higher costs have to be quantified.

Table 1b.6-1 RSPO premia and cost indicators (USD per tonne, May 2019 data)³³

USD/tonne	Book & claim (Palm Trace)	Mass Balance (MB)	Identity Preserved (IP), Segregated (SG)
Premia for certified sustainable palm oil (CSPO)	2.50 to 3.50 (-)	6 to 17 (=)	25 to 30 (+)
<i>compliance cost / floor</i>	<i>Lge plantation: 2 to 5#</i>	<i>Influenced by ISCC*</i>	<i>9 to 15, field to refinery</i>
	<i>Smallholder: 8 to 12#</i>	<i>Increased regional variance?</i>	
Premia for stearin	n/a	30 to 40 (-)	75 to 85 (-)
<i>compliance cost / floor</i>		<i>weakened influence of product yield factor</i>	
Premia for certified sustainable palm kernel oil (CSPKO)	18 to 22 (--)	33 to 40 (--)	90 to 100 (=)
<i>compliance cost / floor</i>	<i>(P&C cost loaded onto CSPO)</i>	<i>cost of a small PK crusher implies 60-80</i>	<i>faces inelastic supply</i>

Notes: CSPO costs are ex-mill. IP/SG cost includes higher FFB transport cost, tank washing, transport in small vessels, new tanks.

Price trend in last 1-2 years, (=) largely unchanged, (+) increase, (-) decrease, (--) large decrease. *ISCC premia (for biodiesel in EU) reported as USD12-25 for low to high GHG savings material. # Upstream 5 cost is anticipated to increase with upgraded new

³³Author's update of data prepared for "Study on the environmental impact of palm oil consumption and on existing sustainability standards for European Commission, DG Environment"

http://ec.europa.eu/environment/forests/pdf/palm_oil_study_kh0218208enn_new.pdf

RSPO P&C 2018 (to be implemented Nov 2019). Increased cost is being determined. Key players do not expect cost recovery as there is slower demand for RSPO material and returned (suspended) suppliers add to volume, affecting key products such as CSPKO B&C and MB (which had spiked up on IOI 's past suspension); moreover, underlying coconut oil prices have nosedived.

Source: Industry interviews by author, May 2019. Updating on data from Barthel et al. (2018) also prepared by author.

Literature and key findings by Barthel et al. (2018)³⁴, drawing largely on LMC International's market research and literature review (conducted by the author of this paper) explain the situation in 2017 as follows:

- The costs of compliance with the P&Cs include costs that are both direct (membership, audit) and indirect (some upgrades to capital and operating expenditure).
- RSPO premia have ranged from \$2 per tonne for tradable certificates to \$300 for integrated plantation suppliers of RSPO products, able to supply specialist products, such as PKO, with segregated chain-of-custody that require more sophisticated supply chains. The RSPO prices within easy reach of smallholders have only ranged up to \$12, barely covering their costs without a subsidy from a buyer.
- The oversupply of CSPO results in a basic RSPO premium that is in the region of \$2 per tonne. RSPO compliance costs for CSPO are usually higher than the premium. For plantations they are around \$5 per tonne (ex-mill) and for small producers between \$8-12 per tonne (ex-mill).
- Costs of certification to smallholders have been cited in the region of \$12 per tonne, with a cost of \$8 per tonne often cited more recently. This roughly matches the premium they receive. However, if the smallholders are unable to sell 100% of the certificates there would be a financial shortfall.
- Higher premia are available for suppliers of segregated palm oil and downstream specialist products (such as palm kernel oil, oleochemicals and surfactants). However, these are usually the preserve of larger integrated companies.
- Margins on certified products were considered good by the large integrated plantations in 2015 and were even better in 2016, as premia spiked due to the four-month suspension of IOI, a major supplier of value-added specialist products. However, some leading suppliers of certified and value-added processed palm products report that the multi-year cumulative cost of investment in certification has yet to be recouped. The RSPO's direct appeal is not self-evident to many smallholders and the premia and levels of demand are uncertain.
- The outlook is for some changes, notably the RSPO's move to develop a jurisdictional approach (with its plans for Ecuador and an awaited Sabah model) to ease the entry of new suppliers. Also, the RSPO has a policy to be more inclusive of smallholders and is directed towards reform to assist smallholders. These efforts may help to rebalance the disadvantage that small suppliers and smallholders face; but deficient demand is a core problem, with only half of available RSPO certificates bought as such. More supply may add to the existing supply glut.
- We may conclude that the cost of sustainability leaves no or low margins for smallholder farmers. One might expect a price incentive or robust demand to emerge for independent smallholder certified material from big buyers who would like to be inclusive of smallholders.

³⁴“Study on the environmental impact of palm oil consumption and on existing sustainability standards for European Commission, DG Environment”http://ec.europa.eu/environment/forests/pdf/palm_oil_study_kh0218208enn_new.pdf

Unfortunately, demand is poor. Reasons include demand for online traded independent smallholder credits has been overshadowed by buyers' desire to move towards traceable, physically traded RSPO products, leaving smallholders at a disadvantage; and buyers fear association with fires and deforestation and find it safer to buy from large companies with sizeable sustainability monitoring teams.

The findings are in the same vein as Rietberg and Slingerland's (2016)³⁵ study for RSPO smallholders: Upfront costs of certification of three groups of independent smallholders in Indonesia and Malaysia were 87, 114 and 215 EUR per hectare. For independent smallholders in Indonesia, these costs were estimated to be equivalent to 5% and 14% of mean annual revenue from oil palm. (The average cost of EUR 139 / tonne is about 8% against an indicative price for CPO of EUR 516 per tonne for Jan-Mar 2019, assuming 3.5 tonnes of CPO per hectare.) The evidence of increased profitability in the first year after certification is inconclusive. GreenPalm premiums are very small: only 1-4% of CPO prices. This would sometimes but not always be sufficient to cover recurrent costs. There is limited evidence that certification of independent smallholders increases yield."

The high certification costs for less organised smallholders affect their inclusion. "In September 2016, Solidaridad reported that its West Africa oil palm smallholder sustainability project was costing EUR 147 per smallholder³⁶. If one supposes that the average plot size was 2 hectares per smallholder, with a yield of 3 tonnes of CPO per hectare, this is approaching USD 30 of added costs per tonne of CPO. This is higher than USD 12/tonne added cost observed for fairly large (50 hectare) smallholders in Malaysia in 2015, and USD 8/tonne for the new wave of highly organised smallholders."³⁷

An interview with RSPO certified product supplier (Feb 2017, in Barthel et al., 2018) emphasised the more positive premium and cost circumstances benefiting the profitability of larger producers: "Large RSPO certified product suppliers can cover their direct and indirect costs and earn a market premium on certificates sold. These margins can boost their overall financial profits, and the margins are not required by policy to be directed toward conservation programmes (but companies may voluntarily spend on corporate social responsibility efforts). Where payments are made to compensate for the loss of HCV areas, the RSPO is said to direct plantation companies to fund conservation projects with additionality and which go beyond RSPO standards."

At the end of 2018, RHV Corley (co-author of the authoritative 'The Oil Palm' and a former head of research for Unilever Plantations), wrote with pessimism about the further expansion of the reach of RSPO certification beyond about 20% of global supply: "A majority of growers appear to regard the RSPO certification as "an unjustifiable cost" given that the price premium for certified oil is negligible. Despite admirable intentions, the certification for smallholders' remains particularly weak. Furthermore, a profusion of other sustainability certification schemes confuses the consumers and appears likely to undermine the RSPO."³⁸

³⁵<http://www.sensorproject.net/sensorwp/wp-content/uploads/2015/04/Costs-and-benefits-ofRSPO-certification-for-independent-smallholders-FINAL.pdf>

³⁶Solidaridad (2016), Presentation by Rosemary Addico, Solidaridad, 9 Jun. 2016, at RSPO's 4th European Roundtable, Milan, Italy.

³⁷"Study on the environmental impact of palm oil consumption and on existing sustainability standards for European Commission, DG Environment"
http://ec.europa.eu/environment/forests/pdf/palm_oil_study_kh0218208enn_new.pdf

³⁸<https://www.thestar.com.my/business/business-news/2018/11/10/does-the-rspo-have-a-future/#t1ZaCGfUrtB7dR67.99>

Higher costs for RSPO P&C 2018 add to both the cost and exclusivity problems of the RSPO. It has hopes to address this in part by expanding its supply base with smallholders and a jurisdictional approach; if its stakeholders are willing to accept this.

Major Findings

- The major finding of a regressive cost structure (relatively high unit costs for smallholders) is consistent across various studies. The other cost is for supply chain certification by processors and traders and relates to certification premia for stearin and palm kernel oil.
- The benchmark CSPO book & claim (B&C) has fallen further but large plantations may be squeezing a margin on current costs. But under the more rigorous RSPO P&C 2018 (implemented from Nov 2019) the new higher costs have to be quantified.
- The high certification costs for less organised smallholders affect their inclusion.
- Higher costs for RSPO P&C 2018 add to both the cost and exclusivity problems of the RSPO. It has hopes to address this in part by expanding its supply base with smallholders and a jurisdictional approach; if its stakeholders are willing to accept this

1c Other Supply Chain Basics

1c.1 Trade Flow

This section presents trade flow information by Indonesian region (Sumatra-Riau Islands, Java, and Eastern Indonesia) to China; with identification of key exporting ports for key regions of Sumatra, Kalimantan, Java, Sulawesi, and West Papua, such as the ports of Belawan, Padang, Dumai, Panjang, and Gresik. The summary of export volumes and values for key palm products (4-digit HS code) exported from identified ports bound for China, is based on data from the UN International Trade Center (ITC) and Indonesian Department of Statistics (BPS).

Key Product Categories

According to ITC, Indonesia exported USD 3.3 billion (Table 1c.1-1) and 5.5 million tonnes (Table 1c.1-2) of palm products to China in 2018.

Table 1c.1-1 Summary of Value of Indonesian Palm Exports to China, 4-HS Code, 2014-2018

(USD)	2014	2015	2016	2017	2018
Palm oil and its fractions	1,789,195,000	2,038,849,000	1,632,526,000	2,068,902,000	2,084,280,000
Palm kernel oil and fractions	356,022,000	450,287,000	548,590,000	582,825,000	563,769,000
Palm kernel expeller	51,137,000	29,654,000	27,385,000	38,665,000	52,143,000
Biodiesel	672,812,000	11,495,000	717,000	0	425,980,000

Data: ITC

Table 1c.1-2 Summary of Weight of Indonesian Palm Exports to China, 4-HS Code, 2014-2018

(tonnes)	2014	2015	2016	2017	2018
Palm oil and its fractions	2,137,076	3,277,728	2,404,335	2,852,026	3,240,188
Palm kernel oil and fractions	305,373	478,039	405,369	414,110	551,330
Palm kernel expeller	341,821	305,075	262,689	303,290	397,540
Biodiesel	736,588	12,229	907	0	598,926

Data: ITC

- According to BPS, Indonesia exported over USD 2.7 billion³⁹ worth of primary palm oil products in 2018, including refined fractions of palm and palm kernel oil. At the HS-6 level, Indonesia exports nine (9) key products to China.
- The majority of Indonesia's exports to China are in the form of fractions of palm oil, such as Refined Bleached Deodorised (RBD) palm olein and palm stearin. In 2018, Indonesia exported over USD 2.1 billion worth of palm oil fractions, 55% of Indonesia's total palm exports to China in the same year. Second most significant export is palm kernel fractions, valued at USD 551 million (15% of Indonesia's total palm exports to China).

Key Origins in Indonesia

- Sumatra (including the Riau Islands) is Indonesia's largest exporter to China (supplied USD 1.6 billion by value, equivalent to 42% of Indonesia's vegetable oil exports to China. This equates to 24% of China's total vegetable oil imports. The region mainly supplied China with crude and refined palm oil fractions, including USD 1.2 billion worth of palm oil fractions. The key port in Sumatra is Dumai (in Riau province), which facilitated 63% of Sumatra's palm exports to China.
- Kalimantan supplied China with USD 727 million worth of palm products, equivalent to 19% of Indonesia's total vegetable oil export to China. This equates to 11% of China's total vegetable oil imports. The region primarily supplied China with crude and refined palm oil fractions valued at USD 632 million (87% of Kalimantan's total palm exports to China), palm kernel oil fractions (USD 91 million, 13%), and palm/palm kernel expellers (USD 3.5 million, 0.4%).
- Java (primarily Wilmar International in Gresik and Tanjung Perak) supplied China with USD 285 million worth of palm products, equivalent to 7.5% of Indonesia's palm exports to China. This equates to 4.2% of China's total vegetable oil imports. The region primarily supplied China with crude and refined palm oil fractions valued at USD 208 million (73% of Java's total palm exports to China), palm kernel oil fractions (USD 59 million, 21%), and palm/palm kernel expellers (USD 17 million, 6.0%).
- Sulawesi supplied China with USD 82 million worth of palm products, equivalent to 2.2% of Indonesia's palm exports to China. This equates to 1.2% of China's total vegetable oil imports. The region primarily supplied China with crude and refined palm oil fractions valued at USD 51 million (63% of Sulawesi's total palm exports to China), palm kernel oil fractions (USD 25 million, 31%), palm/palm kernel expellers (USD 5 million, 6.2%), and crude palm kernel oil (less than USD 1 million, 0.2%).

Palm Oil in China - Quick Facts

- China imported USD 6.8 billion worth of palm products in 2018, USD 3.8 billion of which are from Indonesia.
- According to Trase data from 2013⁴⁰, Guangdong province imported USD 61 million worth of palm products from Indonesia, USD 24 million through the port of Belawan (West Sumatra) and USD 23 million through the port of Tarjun (South Kalimantan). Both ports cumulatively supply

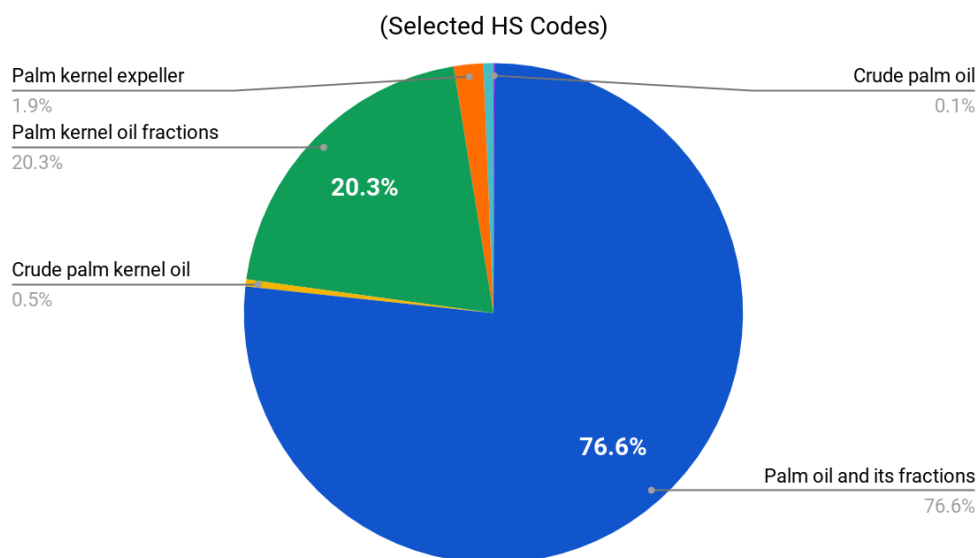
³⁹See Methodology - Limitations chapter for further information on the inconsistency between ITC and BPS values.

⁴⁰Please see 'Limitations' for further details on constraints of Trase data.

up to 74% of Guangdong’s and 55% of China’s inbound palm products from Indonesia. The second major Chinese palm importing province is Liaoning, which imported USD 12 million worth of palm products, primarily through the ports of Kabil/Panau (USD 5.6 million, Riau Islands), Tanjung Priok (USD 3.3 million, Jakarta), and Belawan (USD 3.1 million). Jointly, these ports supplied 98% of Liaoning’s inbound palm products from Indonesia.

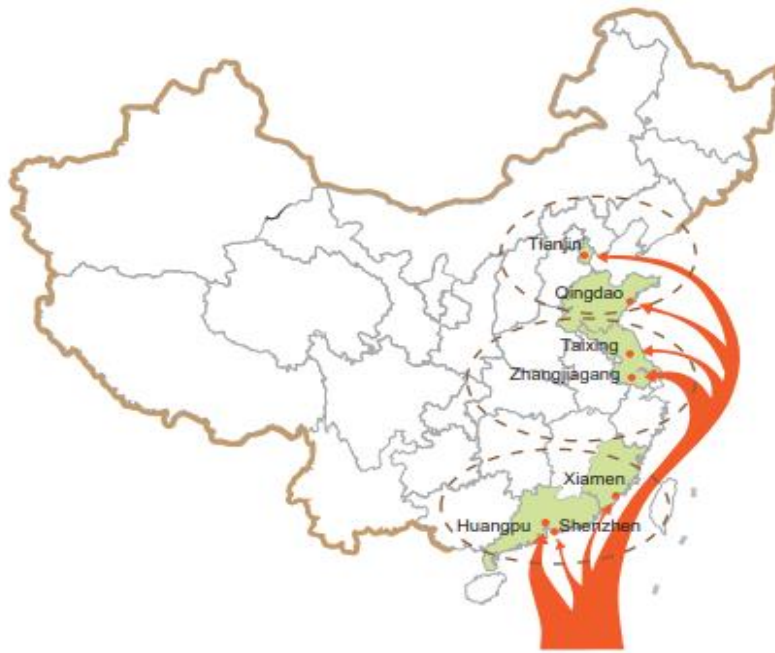
- Subsequently, in 2017, 2018 and 2019, Nanjing Customs was the largest palm oil importing port in China. In 2019, Nanjing imported 2.103 million tonnes of palm oil, with a total amount of USD 1.21 billion, followed by Huangpu Customs. In 2019, 1.901 million tonnes of palm oil were imported through Huangpu Customs, with a total amount of USD 1.04 billion (CFNA, 2020).
- Overall, key product categories in 2018 were crude and refined fractions of palm oil (77% or USD 2.1 billion, mostly from Sumatra), fractions of palm kernel oil (20% or USD 551 million), and relatively smaller proportion of palm/palm kernel expellers (2% or USD 52 million, mostly from Sumatra), biodiesel (0.6% or USD 18 million, from Sumatra), crude palm kernel oil (0.5% or USD 12 million, mostly from Sumatra), and crude palm oil (0.1% or USD 1.9 million, from Sumatra). See Diagram 1c.1-1a.

Diagram 1c.1-1a Value of China’s palm oil imports from Indonesia, by product, 2018



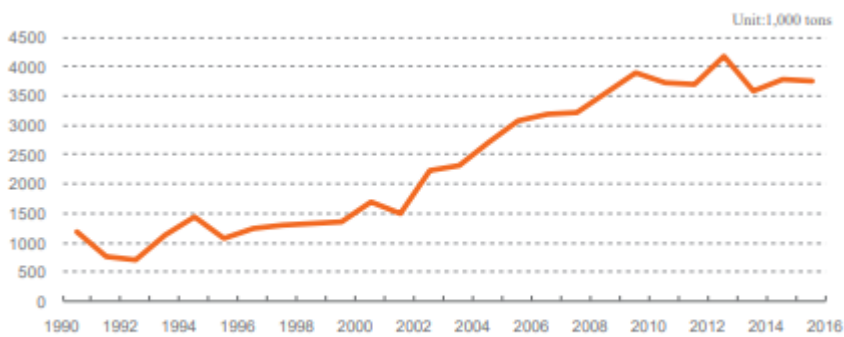
Note: To all provinces in China in year 2018 Data: BPS

Diagram 1c.1-1b Palm Oil Trade Flow in China



Source: Palm Oil Futures Trading Manual, Dalian Commodity Exchange (2016)⁴¹

Diagram 1c.1-1 China's consumption of edible palm oil, 1990/91-2015/16



Source: U.S. Department of Agriculture

Source: Palm Oil Futures Trading Manual, Dalian Commodity Exchange (2016)⁴²

⁴¹<http://www.dce.com.cn/DCE/resource/cms/2017/05/ZDCE%20Palm%20Oil%20FuturesTrading%20Manual.pdf>

⁴²<http://www.dce.com.cn/DCE/resource/cms/2017/05/ZDCE%20Palm%20Oil%20FuturesTrading%20Manual.pdf>

However, it should be noted here that the domestic onshore trade is a significant feature of the China palm oil trade. Wilmar traceability information (as a proxy indicator) points to major onshore China palm oil buying; broadly 10-40% for palm and 30-70% for palm kernel oil, taking 'unknown' source as probable China onshore physical buying. CFNA (2020) reports that the ratio for onshore trading is actually "broadly higher than 60% for palm." Due to the practice of 'shadow financing', palm oil can be purchased cheaper onshore in China than the actual cost of imports.

According to CFNA, China's total refining capacity is 21,900 tonnes per day, with East China having the highest refining capacity of 51% of total national capacity.

The Dalian Commodity Exchange or DCE (2017)⁴³ notes the following about the palm oil sector in China; about key import regions, supply-chain players, end-uses, seasonality and DCE designated warehouses:

- In China, palm oil trading companies are plenty and the circulation channels well developed. North China (Tianjin and its neighbouring cities as well as Shandong Province), East China (Shanghai and its neighbouring cities such as Zhangjiagang, Taixing and Ningbo) and South China (Guangzhou and its neighbouring cities such as Haungpu, Shenzhen and Xiamen) are the three major regions where palm oil is imported, processed and sold. The three regions import 24%, 34% and 34% respectively, adding up to 92% of the country's total importation.
- There are thousands of palm oil processing factories in China⁴⁴ located in the neighbourhood of major ports of entry. According to customs statistics there were 50 plus large oil companies importing palm oil in 2009, whose import volume accounted for approximately 60% of China's total.
- There are currently near 10,000 palm oil trading companies in China.⁴⁵ Palm oil imported by the large ones is then distributed by a large number of distributors. In 2009, there were 80 plus trading companies importing approximately 34% of the palm oil for the country. Without dedicated warehouses of their own, these companies usually rent tanks from oil or warehousing companies.
- Palm oil is used in both food and industrial consumptions. According to statistics provided by traders, most of China's palm oil consumption is food related with 24 degree (temperature) refined palm oil taking up over 60% of market share. In 2013-2015 the amount was 3.6-3.8 million tonnes each year.
- In recent years, the country's consumption and application of industrial palm oil increased in a stable manner. In 2013, China consumed 2.10 million tonnes of industrial palm oil.
- Around 80% imported palm oil is circulated as a commodity, while the remaining 20% is used in end-uses, raw material processing and commerce, as well as intermediary trading in bonded areas.
- There are more than one thousand significant palm-oil-consuming companies, alongside some four thousand small ones. These companies are mainly from catering, food processing and chemical industry, most prominent among them being instant noodle makers Uni-President and Ting Hsin International Group, and daily chemicals manufacturers P&G and Nice Group. Most palm-oil-consuming companies do not import by themselves but buy from intermediaries. In 2009, there were only around 30 consumer-importers, importing 4% of the total amount.

⁴³<http://www.dce.com.cn/DCE/resource/cms/2017/05/ZDCE%20Palm%20Oil%20FuturesTrading%20Manual.pdf>

⁴⁴However, CFNA (2020) reports that there are one hundred and more palm oil processing factories.

⁴⁵CFNA (2020) reports that in 2019, there were 65 palm oil trading companies that imported palm oil in China.

- Palm oil consumption is seasonal because of its relatively high melting point, which means more palm oil is consumed in summer than in winter... (imports) are relatively low in January and February.
- Refer to Annex for list of Dalian Commodity Exchange (DCE) designated delivery warehouses for RBD Palm Olein. Warehouses (tank farms and warehouses) are operated by COFCO (three), Sinograin (three), Wilmar International (three), Cargill (two) and others; and factory warehouses are operated by Julong (two) and others.

Major Findings

- The majority of Indonesia's exports to China are in the form of fractions of palm oil, such as Refined Bleached Deodorised (RBD) palm olein and palm stearin.
- According to ITC, Indonesia exported USD 3.3 billion and 5.5 million tonnes of palm products to China. According to BPS, Indonesia exported over USD 2.7 billion worth of primary palm oil products in 2018, including refined fractions of palm and palm kernel oil.
- Sumatra (including the Riau Islands) is Indonesia's largest exporter to China (supplied USD 1.6 billion by value, equivalent to 42% of Indonesia's vegetable oil exports to China)
- According to Trase data from 2013, Guangdong province imported USD 61 million worth of palm products from Indonesia, USD 24 million through the port of Belawan (West Sumatra) and USD 23 million through the port of Tarjun (South Kalimantan).
- In China, palm oil trading companies are aplenty, and the circulation channels well developed. North China (Tianjin and its neighbouring cities as well as Shandong Province), East China (Shanghai and its neighbouring cities such as Zhangjiagang, Taixing and Ningbo) and South China (Guangzhou and its neighbouring cities such as Haungpu, Shenzhen and Xiamen) are the three major regions where palm oil is imported, processed and sold. The three regions import 24%, 34% and 34% respectively, adding up to 92% of the country's total importation.

1c.2 Key Exporters and Importers

We now turn to a short summary of key exporters of palm oil to China and key Chinese importers/buyers at the national level. The following is based on publicly available UN trade data and customs data and presented on an as-is basis.

Key Exporters

The palm industry is highly diversified and significantly weighted towards domestic consumption and processing. Tracing Indonesian palm oil companies through the supply chain is challenging as it is standard practice for large companies to use different subsidiary names.

Trade associations and data indicate the existence of at least 82 palm oil mills in Central Kalimantan, 62 mills in East Kalimantan, and 95 in West Kalimantan, making a total of at least 239 mills between approximately 60 major groups and companies that operate in Kalimantan. Sumatra is estimated to have 482 mills across 775 companies. This is consistent with estimates that indicate Sumatra has the largest planted area, estimated at 6.39 million hectares.

Despite this diversity, Wilmar continues to dominate the refinery and trading business, controlling about 50% of total refinery capacity in the region; while Musim Mas and others account for the rest. Refiners are key players in aggregating palm oil from mills and trading-processing it for international and internal trade.

Chain Reaction Research (2017)⁴⁶ notes: Large, vertically integrated conglomerates dominate the refining phase of the palm oil supply chain. Such companies are involved in production, processing and trade of palm oil. Their refineries are supplied by their own mills and plantations, as well as by a large number of third party suppliers. Indonesia has a total refining capacity of approximately 45 million MT per year. Chain Reaction Research has identified 78 refineries in Indonesia. Five company groups (Wilmar, Musim Mas, Golden Agri-Resources, Apical and Best Group) account for 66 percent of Indonesian refining capacity. Indonesia has stimulated the development of domestic refining capacity through structured trade tariffs. It has also pushed for increased palm oil-based biodiesel consumption.

⁴⁶<https://chainreactionresearch.files.wordpress.com/2017/11/unsustainable-palm-oil-faces-increasing-market-access-risks-final-2.pdf>

Key groups	Company information (a)		Indonesia	China
	Mill counts, supplying refineries (b)	Group-owned mills, volume %, selected refineries	No. refineries	No. refineries
Wilmar International*	45 own mill count, 577 external mill count	c. 14% (CPO), c 11% (PKO)	25 (but only 14 are in the dashboard)	58 (but no refineries in dashboard, 10 spec. fat and oleo are in dashboard) (c)
Musim Mas*	16 own mill count, 638 external mill count	n/a	9	3 (all 3 with spec. fat?)
Golden Agri-Resources*	46 own mill count, 403 external mill count	c. 38% (CPO), c. 31% (PKO)	6	0
Indofood Agri Resources (largely for in-house use)	26 own mill count, no information on external mill count	n/a	5	0
Best Group	n/a	n/a	5	0
Asian Agri-Apical*	20 own mill count, 581 external mill count	c. 9% (CPO), c. 48% (PKO)	4	1
Astra Agro Lestari (largely domestic)	19 own mill count, 81 external mill count	c. 66%	3 (d)	0
Kuala Lumpur Kepong	n/a	n/a	2 (d)	0 (oleo facility)
First Resources	15 own mill count, 33 external mill count	c. 93% (CPO), c. 99% (PKO)	2	0

Notes: *Key groups of Indonesia linked to China trade, n/a - data not available, (a) From Company annual reports, sustainability reports or dashboards, (b) Mill counts may include multiple counting; and refineries are all refineries in all locations, (c) Wilmar International China refineries includes those of subsidiaries and associates, (d) Astra Agro Lestari and Kuala Lumpur Kepong are operating one refinery in joint venture with each other.

With reference to the percentage of volume supplied to refineries by the respective group-owned mills**:

- For Wilmar International, it ranges 2-48% for 11 Indonesia refineries (CPO) and 0-24% for 9 facilities (PKO), from 69 own mill count**.
- For Golden Agri-Resources, it ranges 23-70% for 6 Indonesian refineries (CPO), and 5-56% for 5 Indonesian KCPs (palm kernel, ultimately for PKO) from 75 own mill count** (CPO) and 59 own mill count** (PKO).
- For Asian Agri-Apical, it ranges from 0-27% for 3 Indonesian refineries (CPO), and 16-100% for 3 Indonesian KCPs (palm kernel, ultimately for PKO) from 24 own mill count** (CPO) and 29 own mill count** (PKO).
- For Astra Agro Lestari, it ranges 17-100% for 3 Indonesian refineries (most likely CPO) from 19 own mill count**.
- For First Resources, it is 93% for Indonesian refineries (CPO) and 99% for Indonesian KCPs (for PKO), from 16 own mill count**.

**Multi-counting of mills is possible as one mill may be supplying to several refineries.

A review of data from ITC and Trase provides a similar view of the direct key exporters (according to bills of lading) to China. By region of origin, and CPO-equivalent volume, they include:

Table 1c.2-1 Indonesia Key Regions & Ports to China Major Receiving Ports

Indonesia Key Region & Ports	China Major Receiving Ports
Sumatra - Batam Island, Belawan, Dumai, Kabil/Panau, Kuala Tanjung, Palembang, Panjang, Tarahan, Teluk Bayur	Huangpu, Tianjin, Rizhao, Zhangjiagang
Java - Gresik, Tanjung Emas, Tanjung Perak, Tanjung Priok	Huangpu, Tianjin, Lianyungang
Kalimantan - Balikpapan, Kota Baru, Sampit, Tarjun	Huangpu, Tianjin, Zhangjiagang
Sulawesi - Bitung, Mamuju, Pantoloan, Sv	Huangpu, Zhangjiagang, Shanglai, Jiangling

Data: Trase for 2014

Table 1c.2-2a Indonesia Key Ports and Exporters for China Palm Product Trade

Key Region & Ports	Export Volume to China (Tonnes)	Last Exporter (Trase, based on volume)
Sumatra - Batam Island, Belawan, Dumai, Kabil/Panau, Kuala Tanjung, Palembang, Panjang, Tarahan, Teluk Bayur	2,154,660	Socfin Indonesia, Musim Mas, Perkebunan Nusantara Vii (Persero), Perusahaan Perkebunan London Sumatra Indonesia (Salim-Indofood), KL Kepong, Permata Hijau Sawit, SIPEF, Bumi Waras, Ganda Group (owner was cofounder of Wilmar), HSA Group, Tanimas Group, IFFCO, Buasa Wira Subur Sakti, Kreasijaya Adhikarya (KL Kepong), Astra International (Astra Agro Lestari - Jardine)
Java - Gresik, Tanjung Emas, Tanjung Perak, Tanjung Priok	817,635	Wilmar, Asian Agri, Salim-Indofood, Darmex Agro, Ivomas Pratama (Salim-Indofood), Perkebunan Nusantara Viii (Persero), Sinar Mas/Smart, Dharma Satya Nusantara, Sime Darby, Bakrie Group, Sampoerna Agro, Dua Kuda, Pt. Sumi Asih, Batara Elok Semesta Terpadu, Bina Karya Prima, Karyaindah Alam Sejahtera, Megasurya Mas
Kalimantan - Balikpapan, Kota Baru, Sampit, Tarjun	754,621	Sinar Mas, Perkebunan Nusantara Vi (Persero), Rea Kaltim Plantations, IJM, Sime Darby, PT Kalimantan Kelapa Jaya
Sulawesi - Bitung, Mamuju, Pantoloan, Sv	429,623	Bukit Zaitun, Bintang Terang Abadi, Subrato, Multi Nabati Sulawesi (Wilmar), Astra International (Astra Agro Lestari - Jardine)

Data: Trase for export volumes and key exporters for 2014. Note: 2014 is the most recent year for data from Trase, as at 24 June 2019. In that year, Indonesia exported 2.4 million tonnes to China; and exports to other countries (million tonnes) included: 4.9 to India, 1.9 to Pakistan, 1.4 to Italy, 1.2 to Netherlands, 1.0 to Egypt, 0.9 to Spain, 0.8 to Singapore and 0.5 to Russia.

Key Importers

According to UN trade data (export basis), China imported 5.8 million and 10 million tonnes of palm and lauric (from palm kernel oil) products in 2017 and 2018 respectively, with approximately 57% from Indonesia in 2017-2018. CFNA (2020) points out that China imported 5.16 million and 5.4 million tonnes of palm and lauric (from palm kernel oil) products in 2017 and 2018 respectively, with 61% and 68% from Indonesia.

The dominant palm oil player is Wilmar International (closely linked with the Kuok Group, via a mega merger in 2006⁴⁷), often cited to have a market of about 50% in the palm trade. It reports that it has a 25% market share of global vegetable oil processing with 51 refineries, 10 oleochemical plants, six specialty fat facilities, with an additional seven refineries, two oleochemical plants, and two specialty fat facilities through associates.

Public data on market shares in China is patchy and confusing as the basis of declared market shares is quite uncertain. To build a picture of key players, this study focused on the refinery sector as the key gatekeeper or entry-point for palm oil, and we spoke to expert sources to market shares in this segment.

The key findings from expert interviews about the China refinery segment:

- Wilmar captures more than 50% of the cooking oil and other vegetable fat product market (e.g. by-products such as soap and margarine further downstream).
- Other companies in the import and buying segment include COFCO which is estimated to own 25-30% of the market, and Sinograin that is expected to own 15%.
- The remainder is expected to be dominated by smaller, Chinese domestic companies.
- It is anticipated that COFCO could increase its market share to 40% of the palm and lauric market as it completes the construction of refineries; as China seems wary of large market share controlled by foreigners, including Wilmar-Kuok (which is planning a listing for its Wilmar China business in 2019).
- Key uses are edible oil (cooking oil) and specialty-baking fats (with frying for instant noodles rapidly declining); and oleochemicals (relatively small) and biofuel (considered very small).

To gather some insight into key companies at other stages of the palm oil value-chain in China, including physical traders, financial traders (that relate to the 'shadow financing' phenomenon that was more rampant a few years ago resulting in onshore palm oil in China that was cheaper than imports) and end users, we reviewed data from Trase (based on bill of lading, providing insight in direct exporter and importer names).

Other company listings include those from the Dalian Commodity Exchange (appointed warehouse and tank farms; Appendix), the RSPO (certified refineries and downstream facilities), and those mentioned in relation to palm oil (category often uncertain) by the China National Grain and Oils Information Center, National Food and Material Reserve Board, in financial news portals such as Reuters and other reports (e.g., by the International Institute for Sustainable Development). These are presented in the Appendix.

⁴⁷<https://www.ft.com/content/c6d11992-8b99-11db-a61f-0000779e2340>

The top vegetable oil players in China

- **Wilmar** captures almost half of the cooking oil and other vegetable fat product market (e.g. by-products such as soap and margarine further downstream).
- Other companies in the import and buying segment include **COFCO** with an estimated 25-30% of the market, and **Sinograin** with perhaps 15%.
- The remainder is expected to be dominated by smaller, Chinese domestic companies.

A review of data in Trase provides the following view of key importers (via bills of lading data) by region and CPO-equivalent volume:

Table 1c.2-2b China Key Ports and Importers for China Palm Product Trade

Key Region & Ports	Import volume from Indonesia (Tonnes)	First Importer (Trase, based on volume)
North China - Tianjin, Dalian, Rizhao, Yantai	776,401	Wilmar, Marubeni, Korea Josong, Wonbong Trading, Korea Ponghwa General Corporation, Korea Mankyung International, Gideon Commodities, Meridien Oleo & Fats, Ecochem Oleochemicals, Rugao City Shuangma Chemical
South & East China - Xiamen, Fangcheng, Dongguan, Quanzhou, Yangjiang, Fuzhou and Huangpu; Zhangjiagang, Jingjiang, Lianyungang, Shanghai	3,515,878	Wilmar, Marubeni, Sinar Mas-GAR, Rugao City Shuangma Chemical, Xiamen Lianshuo Trade, Guangzhou Dingyao Trade, Astra-KLK, Julong

Data: Trase for import volumes and key importers for 2014. Note: 2014 is the most recent year for data from Trase, as at 24 June 2019. In that year, Indonesia exported 2.4 million tonnes to China; and exports to other countries (million tonnes) included: 4.9 to India, 1.9 to Pakistan, 1.4 to Italy, 1.2 to Netherlands, 1.0 to Egypt, 0.9 to Spain, 0.8 to Singapore and 0.5 to Russia.

Major Findings

- Trade associations and data indicate the existence of at least 82 palm oil mills in Central Kalimantan, 62 mills in East Kalimantan, and 95 in West Kalimantan, making a total of at least 239 mills between approximately 60 major groups and companies that operate in Kalimantan. Sumatra is estimated to have 482 mills across 775 companies. This is consistent with estimates that indicate Sumatra has the largest planted area, estimated at 6.39 million hectares.
- Nevertheless, Wilmar continues to dominate the refinery and trading business, controlling about 50% of total refinery capacity in the region; while Musim Mas and others account for the rest.
- The key findings from expert interviews about the China refinery segment: Wilmar captures more than 50% of the cooking oil and other vegetable fat product market (e.g. by-products such as soap and margarine further downstream).
- Other companies in the import and buying segment include COFCO which is estimated to own 25-30% of the market, and Sinograin that is expected to own 15%.

1c.3 Estate and Smallholder Distribution

Official data from the Directorate General for Estate Crops for 2017 indicate that private estates account for 55% (7.7 million hectares) of the total oil palm planted area, followed by smallholders at 41% (5.6 million hectares) and government estates at 5% (0.64 million hectares). A full summary of the distribution of estate and smallholder area in 2017 among Indonesia's regions can be found below:

Table 1c.3-1 Distribution of estates by type, region, and area, 2017

<i>Region</i>	Government Estates	Private Estates	Smallholders	Average Yield (T CPO/ha)	Average Yield (kg/ha)
Java	21,448	7,375	8,856	2.02	462
Kalimantan	72,509	3,681,456	1,129,551	2.78	2,594
Lesser Sunda Islands	0	0	0	0	0
Sulawesi	25,692	253,743	250,653	2.34	1,156
Sumatra	492,768	3,662,527	4,225,908	2.72	2,942
Papua/West Papua	25,726	107,586	82,926	0.15	3,220
Grand Total	638,143	7,712,687	5,697,892	2.70	3,165

Data: Summary of distribution of oil palm planted area (hectares) by region and category of estate, 2017 (latest year where official data is available, from Directorate General of Estate Crops).

Major Findings

- Private estates account for 55% (7.7 million hectares) of the total oil palm planted area, followed by smallholders at 41% (5.6 million hectares) and government estates at 5% (0.64 million hectares).
- Smallholders dominate in Sumatra, while private estates are dominant in Kalimantan and Sumatra. Highest number of government estate area found in Sumatra.

1d Supply Chain Initiatives

A brief qualitative review of current supply chain initiatives related to China-linked sustainable palm oil is based on a concise literature review and interviews with 3-4 supply chain traders and Indonesia-China trade specialists.

Sustainability-related supply chain initiatives for palm oil in China are expanding. CLSA-WWF's review for 2018⁴⁸ points to:

- RSPO building its presence in China with support by key industry associations and major palm-oil buyers
- RSPO is raising awareness among consumers in China
- Chinese RSPO membership is growing
- Commitment to sustainability in competing soya bean industry lagging

The China Chamber of Commerce of Foodstuffs and Native Produce (CFNA) provides regular updates on China's palm oil sustainability and industry updates. Its implementation efforts are supported by the Ministry of Commerce (MOFCOM), and sponsored by the UK's Department for International Development (DFID)⁴⁹. While there is a 'Guide for Overseas Investment and Production of Sustainable Palm Oil by Chinese Enterprises' (with the support of the UK InFIT Programme), the Amsterdam Declaration Partnership says that it "has yet to be implemented."⁵⁰

Looking back to the November 2016 presentation by CFNA on "Palm oil sustainability and industry updates from China"⁵¹:

- For the food and household chemicals sectors, nearly all the sustainable palm oil is demanded by multinational companies. Some of the Chinese suppliers have become RSPO members.
- Sustainable palm oil has not been used in other industrial supplies.
- It is estimated that China imported around 50,000 tonnes of RSPO certified palm oil in 2015 by Wilmar (around 0.77% of the total import volume).
- There is an update for the 'Guide for Overseas Investment and Production of Sustainable Palm Oil by Chinese Enterprises'. (Draft 3 is available⁵²). It is a voluntary Guide for Chinese enterprises planning to or are engaged in overseas investment and production of sustainable palm oil; and is designed to be consistent with the RSPO.

As of 17 October 2019, there is no new media coverage on palm oil outlook in China from CFNA.

In MOFCOM's 2017 Report on the Sustainable Development of Chinese Enterprises Overseas⁵³ Tianjin

⁴⁸http://awsassets.panda.org/downloads/clsau_blue_books_keep_palm_jul_2018_.pdf

⁴⁹http://www.rt13.rspo.org/ckfinder/userfiles/files/China%20SPO%20Guide-PRODUCTION-Version%203_0-RT13_ENG.pdf

⁵⁰<https://ad-partnership.org/commodities/palm-oil/>, accessed 24 May 2019

⁵¹<https://rt14.rspo.org/ckfinder/userfiles/files/Plenary%202%20Chen%20Ying.pdf>

⁵²Draft 3 is here, http://www.rt13.rspo.org/ckfinder/userfiles/files/China%20SPO%20Guide-PRODUCTION-Version%203_0-RT13_ENG.pdf

⁵³<http://images.mofcom.gov.cn/csr2/201708/20170808151845532.pdf>

Julong Group's palm oil project is featured as a case study for SDG17 on Partnerships for the Goals⁵⁴. However, both Tianjin Julong and ZTE Agribusiness plantations are not members of the RSPO (please refer to part 3 for more).

The Indonesia-China key sustainable supply chain initiatives reviewed are the RSPO, POIG and the China Sustainable Palm Oil Alliance. These were reviewed for selected origin plantation groups in Part 1b.5 Key Sustainable Palm Oil Projects. Their key findings for destination, reported by the RSPO in July 2018⁵⁵:

- RSPO. RSPO reports in July 2018 that it has 87 members from China. RSPO reports positive momentum towards its vision for China to achieve 10% CSPO uptake by 2020, as Chinese membership in the RSPO has surged in the past few years. China has 73 RSPO-certified facilities; including at least 20 China-member refineries, pointing to about 21 non-China-member run refineries (including those of Wilmar International) and 32 supply-chain certified (downstream) facilities.
- POIG. No China-origin members, one refinery run by Musim Mas of Indonesia.
- China Sustainable Palm Oil Alliance. The Alliance was jointly launched in July 2018 by the RSPO, CFNA and the World Wildlife Fund (WWF) as a platform for cooperation among stakeholders in the palm oil supply chain and to promote sustainable palm oil in China. Key companies such as Mars Wrigley Confectionery, L'Oréal China, AarhusKarlshamn (AAK), Cargill China, China National Cereals, Oils and Foodstuffs Corporation (COFCO), China Grain Reserves Corporation (Sinograin), HSBC, Yihai Kerry (Wilmar International), SGS China and more gathered at the Forum to make a joint commitment about taking step-by-step actions to promote the adoption of sustainable palm oil in China's palm oil market (RSPO, 2018)⁵⁶.

Just before this, in May 2018, "Premier Li Keqiang has especially agreed to increase [Indonesia's] palm oil exports to China by up to 500,000 tons [per year]," Jokowi said⁵⁷. This is short on details including any sustainability criteria. Palm oil traders have referred to a (higher) quota limit for China being adjusted, and some had been skeptical about actual exports from (Malaysia and Indonesia) rising beyond commercial trends; however, CFNA (2020) clarifies that there is no quota in the first place, and this clarification may help lay to rest the market talk of China quota limits in the palm origins. But the escalating US-China trade war may drive better trade relations between China and Indonesia; and notably, Malaysia tried to secure a higher trade commitment from China for palm oil while it ironed out its Belt and Road Initiative project issues in April 2019⁵⁸. The USDA notes that "On February 19, 2019, the Central Committee of the Communist Party of China (CCCPC) and the State Council unveiled its first policy document for 2019. This document, referred to as the No. 1 Document, traditionally focuses on agricultural and rural issues and is considered to be a significant policy document that outlines goals for the upcoming year. In addition to continuing priorities such as food security and rural development, the document addressed China's slowing economy and "profound changes in the external

⁵⁴Specifically, SDG 17.16: Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries. The case study is entitled "Julong Group Achieves Mutual Benefits with Farmers via Joint Plantation in Indonesia."

⁵⁵<https://rspo.org/news-and-events/news/rspo-launches-china-sustainable-palm-oil-alliance-with-cfna-and-wwf>

⁵⁶<https://rspo.org/news-and-events/news/rspo-launches-china-sustainable-palm-oil-alliance-with-cfna-and-wwf>

⁵⁷<https://www.thejakartapost.com/news/2018/05/07/china-agrees-to-increase-palm-oil-imports-from-indonesia.html> and <https://en.tempo.co/read/918766/premier-lis-diplomatic-mission>

⁵⁸<https://www.thestar.com.my/news/nation/2019/04/25/malaysia-to-export-more-palm-oil-to-china-after-mou/>

environment." The document also confirms China's recent push to increase market access for countries that participate in its One Belt One Road Initiative."⁵⁹

Our source interviews at end May 2019 points to muted views about sustainable palm oil in China. To the question about the step-up of sustainable palm oil efforts for the China supply chain in terms of take up of RSPO certification, other sustainability efforts, a high level source in China agribusiness (including vegetable oil refining) noted that "I do not follow this, but I doubt so." A close RSPO observer noted, "RSPO has new members from China now and many more have obtained certification. But RSPO really need better pull from there. So far it is only push." A very close observer of the trade of Indonesia palm oil notes that "China takes only refined palm and almost zero CPO. The only thing I see China buying more of is palm biodiesel, but more because it is cheaper than petrodiesel. That doesn't go with any certification."

Major Findings

- Sustainability-related supply chain initiatives for palm oil in China are expanding. CLSA-WWF's review for 2018 points to RSPO building its presence in China with support by key industry associations and major palm-oil buyers, raising awareness among consumers in China, and growing Chinese RSPO membership.
- Major Chinese palm oil players - Tianjin Julong and ZTE Agribusiness - are not RSPO members.
- Our source interviews at end May 2019 points to muted (and some pessimistic) views about sustainable palm oil in China.

⁵⁹<https://www.fas.usda.gov/data/china-chinas-2019-no-1-agricultural-document-doubles-down-rural-reforms-face-external-pressure>

Key findings

1a Overview of the Indonesian Palm Oil Supply Chain

- The Indonesian palm oil supply chain starts with the producer (estates managed by plantation companies, their tied or plasma smallholders and independent smallholders) and ends at the port.
- As production continues to expand on a strong increase in planted area, the USDA expects production volume to rise to an estimated 43 million tonnes in 2019/20, with domestic consumption holding at about 30% with its biodiesel mandate.

1b.1 Overview of Indonesian Palm Oil Plantations

- Majority of Indonesian oil palm is planted in Sumatra and Kalimantan, accounting for 59% and 35% of total planted area respectively. In Sumatra, private estates and smallholders dominate, while in Kalimantan, the landscape is dominated by private estates with smallholders responsible for a smaller proportion of planted area.
- Yield averages in Sumatra and Kalimantan are highest, as much as double the yield average of other regions such as Papua/West Papua.
- Refineries are in a number of locations, distributed across Sumatra (including on its west coast) and Kalimantan, in the northern tip of Sulawesi and focused in two zones of Java. Information about the supply networks of the biggest trader-processors GAR (green), Musim Mas (blue), Wilmar (orange) and Asian Agri (yellow) paint a complex web, especially for Wilmar.

1b.2 Summary of High-Risk Areas of Production

- Environmental high-risk areas in Sumatra are Bengkulu and West Sumatra - expansion of oil palm plantations in those provinces will encroach into areas with high density of threatened species and high aboveground live woody biomass. Social risk is highest in Riau and Jambi provinces due to the higher percentage of in-migrants and concentration of EJA complaints
- High risk zones are also found in Kalimantan, with the majority of threatened species and aboveground live woody biomass density concentrated in the Heart of Borneo region, where there are currently no plantations, but where some encroachment has been observed.
- RSPO complaints reports show that social issues (labour, human rights, FPIC) form 61% of RSPO complaints and environmental issues (high conservation value) form 20% of complaints. Complaints peaked in 2013 and 2017, with the majority of all complaints originating from Indonesia (57%).

1b.3 Overview of Plantation Ownership and Investment

- Sinar Mas, Jardine Matheson and Wilmar dominate the industry on a CPO production basis
- On a financing and investment basis, Wilmar International dominates, with projected 2019 capex of USD1.5 billion, followed by GAR's projected 2019 capex of USD150 million, and PT Astra Agro Lestari projected 9% growth on 2018 capex of USD118 million

- Total financing for 60 groups covered in the dataset is shown for bond issuance, corporate loan, revolving credit facility, and share issuance peaked in 2012 at almost USD 9.5 billion and appears to have diminished to about USD 3.5 billion and USD 1.5 billion in 2017 and 2018; perhaps reflecting the internal cash generation abilities of these groups and possible inter-group financing

1b.4 Overview of Chinese Plantation Ownership and Investment

- Tianjin Julong Group's (Julong) plantation activity in Indonesia is best known, and their higher key presence (with large booths) at recent palm oil conferences is notable while ZTE Agribusiness has been relatively low key.
- Despite past headlines about China-linked interest in palm oil and other farm million-hectare mega projects, sources and publicly available information points to more step-by-step outcomes and otherwise limited activity of Chinese interests in palm oil plantation ownership and investment
- Despite early hopes, agriculture does not usually feature among the top 10 sectors of Chinese greenfield FDI in different regions

1b.5 Key Sustainable Palm Oil Projects

- In terms of RSPO certification of mills, the leads are Asian Agri, Musim Mas, Kuala Lumpur Kepong and Golden Agri-Resources.
- The average GHG footprint is based on reports to the RSPO and ranges from 0.90 to 3.39 tCO₂e/tCPO.
- Membership of POIG that extends RSPO commitments is Musim Mas and it is also a member of the China Sustainable Palm Oil Alliance, alongside Wilmar (via Yihai Kerry). Astra Agro Lestari is not a member of the RSPO, and Indofood decided to withdraw from RSPO certification in Jan 2019.

1b.6 Certification and Premiums

- The major finding of a regressive cost structure (relatively high unit costs for smallholders) is consistent across various studies. The other cost is for supply chain certification by processors and traders and relates to certification premia for stearin and palm kernel oil.
- The benchmark CSPO book & claim (B&C) has fallen further but large plantations may be squeezing a margin on current costs. But under the more rigorous RSPO P&C 2018 (implemented from Nov 2019) the new higher costs have to be quantified.
- The high certification costs for less organised smallholders affect their inclusion.
- Higher costs for RSPO P&C 2018 add to both the cost and exclusivity problems of the RSPO. It has hopes to address this in part by expanding its supply base with smallholders and a jurisdictional approach; if its stakeholders are willing to accept this.

1c.1 Trade Flow

- The majority of Indonesia's exports to China are in the form of fractions of palm oil, such as Refined Bleached Deodorised (RBD) palm olein and palm stearin.
- According to ITC, Indonesia exported USD 3.3 billion and 5.5 million tonnes of palm products to China. According to BPS, Indonesia exported over USD 2.7 billion worth of primary palm oil products in 2018, including refined fractions of palm and palm kernel oil.
- Sumatra (including the Riau Islands) is Indonesia's largest exporter to China (supplied USD 1.6 billion by value, equivalent to 42% of Indonesia's vegetable oil exports to China).
- According to Trase data from 2013, Guangdong province imported USD 61 million worth of palm products from Indonesia, USD 24 million through the port of Belawan (West Sumatra) and USD 23 million through the port of Tarjun (South Kalimantan).
- In China, palm oil trading companies are aplenty, and the circulation channels well developed. North China (Tianjin and its neighbouring cities as well as Shandong Province), East China (Shanghai and its neighbouring cities such as Zhangjiagang, Taixing and Ningbo) and South China (Guangzhou and its neighbouring cities such as Haungpu, Shenzhen and Xiamen) are the three major regions where palm oil is imported, processed and sold. The three regions import 24%, 34% and 34% respectively, adding up to 92% of the country's total importation.

1c.2 Key Exporters and Importers

- Trade associations and data indicate the existence of at least 82 palm oil mills in Central Kalimantan, 62 mills in East Kalimantan, and 95 in West Kalimantan, for a total of at least 239 mills between approximately 60 major groups and companies that operate in Kalimantan. Sumatra is estimated to have 482 mills across 775 companies. This is consistent with estimates that indicate Sumatra has the largest planted area, estimated at 6.39 million hectares.
- Despite this diversity, Wilmar continues to dominate the refinery and trading business, controlling about 50% of total refinery capacity in the region; while Musim Mas and others account for the rest
- The key findings from expert interviews about the China refinery segment: Wilmar captures more than 50% of the cooking oil and other vegetable fat product market (e.g. by-products such as soap and margarine further downstream).
- Other companies in the import and buying segment include COFCO which is estimated to own 25-30% of the market, and Sinograin that is expected to own 15%.

1c.3 Estate and Smallholder Distribution

- Private estates account for 55% (7.7 million hectares) of the total oil palm planted area, followed by smallholders at 41% (5.6 million hectares) and government estates at 5% (0.64 million hectares).
- Smallholders dominate in Sumatra, while private estates are dominant in Kalimantan and Sumatra. Highest number of government estate area found in Sumatra.

1d Supply Chain Initiatives

- Sustainability-related supply chain initiatives for palm oil in China are expanding. CLSA-WWF's review for 2018 points to RSPO building its presence in China with support by key industry associations and major palm-oil buyers, raising awareness among consumers in China, and growing Chinese RSPO membership.
- Major Chinese palm oil players - Tianjin Julong and ZTE Agribusiness - are not RSPO members.
- Our source interviews at end May 2019 points to muted views about sustainable palm oil in China.

3a-b Case Studies

This report module introduces short case studies of Indonesia-China linkages and sustainability initiatives for Wilmar International and COFCO⁶⁰ (a 2-page summary for each), as well as Julong and ZTE Agribusiness (1 page each). This is a desktop overview and relies on information from corporate reports.

Yihai Kerry (Wilmar China) & Wilmar International Limited

Overview. Wilmar International Limited is a Singapore-based agribusiness company involved in oil palm cultivation, oilseed crushing, edible oils refining, sugar, rice and flour. 51 of its 101 refineries (capacity of over 28 million tonnes of palm and soft oils) are in China. Its flagship Arawana brand has a 45-percent share of China's edible oils market (oils made from soybeans, rapeseed, corn, sunflower, sesame, groundnut and camellia) as well as rice, flour, soy milk powder, noodles and mixed grains⁶¹. In FYE2018, Wilmar's global sales volume was 24.3 million tonnes of tropical oils (excluding plantation volume), 37.2 million tonnes of oilseeds & grains, 11.7 million tonnes of sugar. In 2007, Wilmar merged with the Kuok Group's oils and grains and oil palm plantation business. The expanded Wilmar Group became a leading integrated agribusiness; bringing together the Kuok Group's oil palm plantations in East Malaysia and Indonesia and Wilmar's Indonesia plantations; and combining the grains & oils enterprises invested in China to establish the Yihai Kerry Group (Wilmar and Kuok, respectively; forming Wilmar China). ADM is long-standing investor and business partner of Wilmar, holding a significant number of shares in the company.

Wilmar International Ltd received a percentage score of 83% on the Sustainability Policy Transparency Toolkit (SPOTT) and ranks 7th out of 70 companies assessed by SPOTT. There is currently no SPOTT assessment for Yihai Kerry (Wilmar China).⁶²

Business units in Indonesia and China⁶³

- Indonesia. Palm-related units: 34 palm oil mills, 8 PK crushers (mostly in Indonesia), 25 refineries, 4 oleochemical, 4 specialty fat, and 12 biodiesel plants. USD 7.56 billion revenue (palm and other products) in Southeast Asia (including Indonesia) in FYE2018; with USD 6.92 billion of non-current assets in FYE2017.
- China. 51 refineries, 10 oleochemicals, 6 specialty fats, and 0 biodiesel; and via associates: 7 refineries, 2, oleochemicals, 2 specialty fats, and 0 biodiesel. Est. 45% market share for palm-based products; including 1.5 million tonnes of cooking oil, frying oil and other; 1 million tonnes specialty fats, 0.5 million tonnes oleochemicals. USD 24.99 billion revenue in FYE2018 (palm and other products); USD 6.90 billion of non-current assets in FYE2017.
-

Public-listing of Wilmar China pending for USD12-13 billion market cap. According to business news⁶⁴,

⁶⁰Given size and complexity, both Wilmar and COFCO warrant the longer overviews.

⁶¹<https://www.agriculture.com/markets/newswire/factbox-wilmars-operations-in-china>

⁶²Data as of November 2018. <https://www.spott.org/palm-oil/>, accessed 17 Oct 2019.

⁶³Global business segments, in Wilmar International's Sustainability Report 2018. Tropical Oils: 24.3 million tonnes, USD17.06 billion revenue (plantations, manufacturing & merchandising palm & lauric oils in over 50 countries). Oilseeds & Grains: 31.2 million tonnes, USD15.69 billion revenue from manufacturing (leading soybean crusher in China and one of the largest flour millers globally), and consumer pack edible oils' 6.0 million tonnes, USD6.79 billion. Sugar: 11.7 million tonnes, USD4.01 billion revenue. Others (Fertiliser & Shipping): USD2.30 billion revenue.

⁶⁴<https://sbr.com.sg/agribusiness/news/wilmars-china-unit-set-12-13b-market-cap-upon-shanghai-ipo-analyst>

Wilmar China’s listing on the Shanghai Stock Exchange is anticipated for 4Q 2019. As the largest listed vegetable oil and food ingredient producer it could have a market capitalisation with USD12-13 billion at its initial public offering or IPO. It has the strong “Arawana” brand in China, a well-known premium household brand for cooking oil, consumer pack rice, flour, and pack dry noodles. Wilmar’s consumer pack edible oils market share is estimated at 45%, with vegetable oils including palm.

Yihai Kerry has invested more than RMB 30 billion (USD 4.4 billion) in China. Employing 27,000, it has more than 70 production bases in 26 provinces, and 100 enterprise entities. Yihai Kerry’s consumer brands include “Arawana”, “Olivoila”, “Orchid”, “Wonder Farm”, “Neptune”, “Fengyuan”, “Golden Delicious”, “Reyland”, “Jiejin 100”, etc. Its products include small package edible oil, rice, flour, fine dried noodles, rice noodles, soymilk, special grains and oils for the catering industry, food raw and supplementary materials, and oleochemicals; sold via its own wide distribution network. Yihai Kerry states that its focus is on “quality grain and oil products that are more nutritional, healthier and safer.”

Facilities map



Note: 51 refineries, 10 oleochemicals, 6 specialty fats. Half or 14 million tonnes of Wilmar’s global refining processing capacity of over 28 million tonnes of palm and soft oils may be in China.

Source: Wilmar company website, accessed 23 Jun 2019; author’s estimate from company information.

Sustainability initiatives, globally: a) Traceability. 96% traceable to the mill. Wilmar (and others) trace supply flows from ports and refineries back to palm oil sources to map their supply base, evaluate suppliers’ performance against NDPE Policy, and engage with suppliers on issues arising; b) RSPO. 76% of planted area is RSPO certified, and about 681,000 tonnes RSPO certified palm oil produced. Wilmar reports globally for 2017 its volume handled/traded/processed that was RSPO-certified (tonnes): Refined/CPO 770,110; PKO 140,644; PKE 140,071; palm-based derivatives and fractions 2,411; c) China Sustainable Palm Oil Alliance; d) Others - 3 mills in Australia are Bonsucro certified.

COFCO

Overview. China's top state-owned grains importer COFCO leads its policy push to look abroad for feed grains. The SOE has been transformed into China's key international agricultural trader and agribusiness. Its plan set aside USD10 billion for overseas deals by 2015, and a target to raise its processing capacity to 77 million tonnes/year from 50 million in 2012. Some of the capacity is in JVs with international trading groups (including Yihai Kerry) against which it will compete. Its purchases of Nidera, Noble and others, builds it into a "credible competitor... (while) Chinese bureaucrats have an uneasy relationship with international grain traders, with some harbouring fears they wield too much pricing power."⁶⁵

COFCO units include: COFCO International, COFCO Trading, COFCO Grains & Cereals, COFCO Oils & Oilseeds, COFCO Biochemical, COFCO Feed, COFCO Sugar, Chinatex, COFCO Engineering Technology, COFCO Wines & Spirits, COFCO Coca-Cola, COFCO Meat, China Tea, Mengniu Dairy, Womai.COM, CPMC, COFCO Capital, GRANDJOY, COFCO NHRI.

COFCO International is focused on being the leader in the global grains, oilseeds, and sugar supply chains, with assets across the Americas, Europe and Asia-Pacific. With 12,000 employees in 35 countries, it trades with over 50 nations for the growing Chinese market. Its shareholders are COFCO, China Investment Corporation, Hopu, Temasek, IFC and Standard Chartered Bank. It has USD34 billion revenue, 105 million tonnes turnover, 33 million tonnes port capacity, 26 million tonnes of processing capacity, 2.7 million tonnes inland storage, 60% of global assets are in the world's No. 1 exporting region, South America.⁶⁶

There is currently no SPOTT sustainability assessment for COFCO.⁶⁷

Business units in Indonesia and China

- Indonesia. COFCO does not operate any oil palm plantations or mills. With one refinery in India, its main role in the palm oil value chain is as a trader and refiner, servicing markets in China and India.⁶⁸
- China. There are 30 manufacturing facilities under COFCO Oils & Oilseeds' management with an annual oilseeds processing capacity of 21.8 million tons, equipped with oils refining capacity of 6 million tons and oils filling capacity of 5 million tons, ranking first in Asia. Annual sales of bulk oil, packaged oil, meal, and specialty oils reached 15.7 million tons. COFCO Oils & Oilseeds is a major supplier of the Fortune brand packaged edible oil and the owner of other various well-known brands such as Fourseas, Fuzhanggui, Sihai, Xiyinying, Guhua and others.⁶⁹ Est. 25% market share for palm-based products.

⁶⁵<https://www.ft.com/content/978dae32-a452-11e3-b915-00144feab7de>

⁶⁶COFCO International website, Jun 2019.

⁶⁷Data as of November 2018. <https://www.spott.org/palm-oil/>, accessed 17 Oct 2019

⁶⁸COFCO International 2018 Sustainability Report.

⁶⁹<http://www.cofco.com/en/BrandProduct/COFCOOils/>

Facilities map



Note: 30 facilities. Crushing processing capacity 15.7 million tonnes, refining processing capacity 5.7 million tonnes. In 2018, sales of oilseed meal and vegetable oils were 9.7 million tonnes and 5.7 million tonnes.

Source: China Agri-Industries Holdings Limited (COFCO), 2018 Annual Report

Sustainability initiatives, globally: a) RSPO member COFCO Corporation (China Agri-Industries Holdings Limited) reported for 2017 total volume of all palm oil and oil palm products handled/traded/processed of 210,000 tonnes and RSPO-certified tonnage of Refined/CPO of 6,000 tonnes. b) COFCO's 2018 Sustainability Report states that it is preparing to launch its Sustainable Palm Oil Sourcing Policy in 2019. Working with Proforest, COFCO will also build a sustainability profile for all direct suppliers, tracing palm oil to the mill level. Based on this information, environmental and social analysis of the supply base will identify potential hotspots for further supplier engagement and corrective action. A global Integrity Hotline is available for stakeholders to lodge grievances related to palm oil supply chain sustainability. c) China Sustainable Palm Oil Alliance; d) UN initiatives - UN Global Compact, UN Sustainable Development Goals, UN 2030 Agenda for Sustainable Development; e) Others - COFCO Supplier Code of Conduct, COFCO Sustainable Soy Sourcing Policy (working with The Nature Conservancy and WWF), Better Cotton Initiative (BCI), several sustainable coffee certification and verification programmes (including Fair Trade, USDA Organic, 4C, Utz, Rainforest Alliance), IFC Performance Standards.

Tianjin Julong

Overview. Tianjin Julong Group was established in 1993 in China. It has palm oil plantations in Indonesia. The company is involved in oil palm cultivation, processing, manufacturing, and trading. In China, its "Holiday" brand offers a palm-olive blend, an extra palm fruit oil, a palm-grain blend, and blended oils.

Tianjin Julong received a percentage score of 0.4% on SPOTT's sustainability measure and ranks 70th out of 70 companies assessed by SPOTT.⁷⁰

Palm in Indonesia⁷¹:

- The Julong Indonesia website explains that the group developed its oil palm plantation in 2006 and a supporting crushing plant (palm oil mill) in 2011 in Kalimantan. So far, plantations of 50,000 hectares have been developed, and there is a reserve land bank of 140,000 hectares. Its operations are mainly in Kalimantan and Sumatra, with estates in Central Kalimantan, South Kalimantan, North Kalimantan, West Kalimantan, and South Sumatra.
- It has more than 40 Indonesian companies cooperating for oil palm planting, with a total area of 10,000 hectares, benefiting more than 5,000 families and 20,000 people in the local community.
- When its first palm oil mill in the South Kalimantan came into production in January 2011, it was the first ever such owned by a Chinese enterprise.
- With 60,000 hectares of oil palm, Julong's estates and cooperating companies may produce over 200,000 tonnes of palm oil each year (assuming 3.5 tonnes of CPO per hectare).

Palm in China⁷² -- "The leader of China's oil palm industry as well as the world's first palm oil processor to achieve the "Green Food" certificate, owns the highest palm oil market share in China, and was a "Top 20 Global Competitive Company" in 2011-2012; 2012 operating revenue of CNY20 (USD2.9) billion."

Sustainability initiatives and issues

- The company is not a member of the RSPO. Tianjin Julong Group was suspended in late 2017 (for non-submission of ACOP reports for two consecutive years, and suspended members are given a couple of months to update this).⁷³ Tianjin Julong was not a member as at 24 May 2019⁷⁴, (the company's membership was terminated in Oct 2017). It was a member under Tianjin Julong Trade Co.,Ltd in the Palm Oil Processors and/or Traders category from China. Around the same time, a subsidiary of Julong Group was mentioned in the RSPO Complaints system, but the case was closed for lack of a formal complaint.⁷⁵

⁷⁰Data as of November 2018. <https://www.spott.org/palm-oil/>, accessed 17 Oct 2019

⁷¹<https://julongindonesia.com/about.html>

⁷²<http://www.julongchina.com/en/>

⁷³<https://www.marketscreener.com/news/RSPO-Roundtable-on-Sustainable-Palm-Oil-Suspension-and-Termination-due-to-non-submission-of-ACOP-r--25133466/>

⁷⁴<https://rspo.org/members> accessed on 24 May 2019.

⁷⁵"Supply Chain PT Rezeki Kencana (subsidiary of Julong Group) a supplier of Wilmar International. Link-Ar Borneo on 30 April 2017 alleged that PT Rezeki Kencana breached RSPO P&C by: i. developing the land owned by Serikat Tani Darat Jaya from Desa Kampung Baru without proper FPIC (land grabbing); ii. Criminalised and intimidates the local community. Status: Box A. complaints received. Status update, 24 August 2017 – The company had explained

- In May 2017, the United Nations Development Programme issued the “China Enterprises Overseas Sustainability Report 2017” during the “Belt and Road” Summit Forum, the case of Julong Group and the sustainable development practices of 18 Chinese companies including PetroChina, Huawei and Hainan Airlines were presented.⁷⁶

ZTE Agribusiness

Overview. Zonergy is a Chinese energy group developing solar PV, green cloud computing, biomass energy, and palm business overseas. The company was founded in 2007 with ZTE, one of China’s largest telecommunications companies, as its major shareholder. Affiliated companies of Zonergy include ZTE Energy Company Limited, ZTE Energy (Tianjin) Company Limited, ZTE Agribusiness Congo SPRL, PT.ZTE Agribusiness Indonesia, ZTE Energy (Inner Mongolia) Company Limited and ZTE Energy Company Limited Shenzhen Branch. It has major projects in Pakistan, including engineering, procurement, and construction (EPC) services.

There is currently no SPOTT sustainability assessment on Zonergy/ZTE Agribusiness.⁷⁷

Palm in Indonesia

- ZTE’s Zonergy, reports in Dec 2018 that ZTE Energy Palm Park in Central Kalimantan is operational with an 8,000-hectare estate and a palm oil mill; and a 150,000 hectare land bank in Papua. By 2014⁷⁸, PT ZTE Agribusiness Indonesia already managed 32,000 hectares in Sambas, West Kalimantan and East Kotawaringin, Central Kalimantan; with 15,000 hectares planted. It had acquired estates owned by three companies in Sambas, including PT Ranawastu Kencana, PT Karya Boga Mitra, and PT Karya Boga Kusuma. Syamsir with 10,000 hectares of land already planted.
- ZTE Agribusiness has one palm oil mill with a capacity of 60 tons FFB per hour in Sambas, West Kalimantan. For the Sampit region in Central Kalimantan, 5,000 of 7,000 hectares was planted; with estates from PT Sinar Citra Cemerlang. In Sampit, the company planned to build a palm oil mill in 2015 with a capacity of 45 tons of FFB per hour, costing Rp 120 billion.
- In 2014, the company targeted 50,000 hectares in 2015 and 100,000 hectares by 2020; with an investment plan of USD 1 billion, with USD 100 million spent.
- With 30,000⁷⁹ to 50,000 hectares of oil palm, ZTE may produce up to 175,000 tonnes of palm oil each year (assuming 3.5 tonnes of CPO per hectare).

Palm in China: ZTE Agribusiness does not appear to have palm business in China⁸⁰.

Sustainability initiatives and issues: ZTE Agribusiness, the second significant Chinese investor in Indonesian palm oil, is also not a member of the RSPO.

that the complaint was not formally lodged to them, thus they do not have any jurisdiction to approach the complainant. Secretariat to officially close the case.”<https://rspo.org/publications/download/680014ecc9200bc>

⁷⁶http://www.lswz.gov.cn/html/zt/qglscy/2018-06/14/content_237036.shtml

⁷⁷Data as of November 2018. <https://www.spott.org/palm-oil/>, accessed 17 Oct 2019

⁷⁸<https://sawitindonesia.com/2020-zte-agribusiness-targetkan-kelola-lahan-sawit-100-ribu-ha/>

⁷⁹<http://www.zonergy.com/area5/i=29&comContentId=29.html>

⁸⁰http://www.zonergy.com/en_about/i=38&comContentId=38.html

References

Major sources have been listed in the Methodology & Data report segment, and references are in the footnotes within the main body of the report.

Appendix A1: Wilmar's Traceability Information on Palm and Lauric Products

As Wilmar accounts for some 45% of Chinese palm products market share (and more), its reporting is a first point of reference. Below, we review Wilmar's traceability information, focusing on China. Major findings⁸¹:

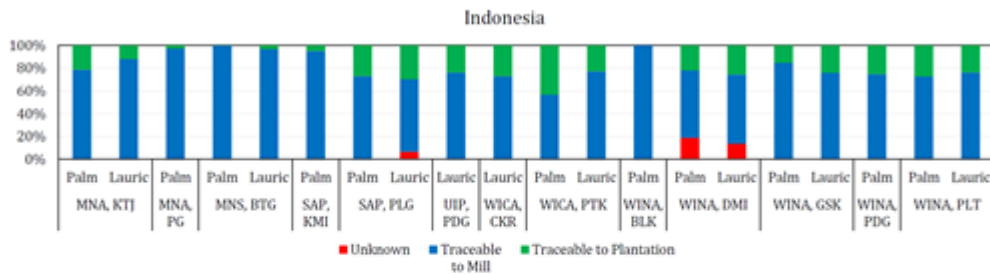
- A. Wilmar's reports on 13 refineries in Indonesia.
- B. Traceability is lower for Wilmar's Indonesia processing units (especially in Dumai-Sumatra) than it is in Malaysia (Peninsula, Sarawak); but efforts on 'traceable to plantations' is advancing and reaching 10-40% where this effort is apparent.
- C. Wilmar reports on specialty fats and oleochemicals for China; 10 entities in all (a tenth of its of its 70-100 production and/or enterprise entities across all its business lines).
- D. It has 6 refineries making specialty fats: with 6 handling palm and 4 handling lauric/palm kernel oil. It has 4 refineries making oleochemicals: using both types of feedstock, palm and lauric.
- E. Wilmar has stronger (higher) traceability for lauric (palm kernel oil) for specialty fats (almost 100%) than for palm (stearin) specialty fats (60-90%); for oleochemicals, palm traceability is about 70-80%) and lauric-oleochemicals traceability has a wide range, with 30-100% traceability.
- F. Wilmar does not currently offer traceability information for core refined products, i.e., for olein and stearin fractions. Some of these would go into making specialty fats and oleochemicals; but the rest would be used for cooking oil, frying oil, end up in biodiesel (if the price is right) and more⁸².
- G. If Wilmar refineries handle about half of China's palm imports i.e., 3 million tonnes per year; and specialty fats account for just over a million tonnes and oleochemicals are likely half a million tonnes (from Wilmar's reported traceability data); so perhaps half of Wilmar's volume is covered in its China reporting. We may also infer that 1.5 million tonnes of Wilmar's palm oil might go to cooking oil, frying oil and other uses.

⁸¹Wilmar Traceability Country Statistics Q1 2019 and author's analysis.

⁸²For information about the olein sector, please refer to Dalian Commodity Exchange (DCE) designated delivery warehouses for RBD palm olein for its 20 key players, in Appendix A2.

Wilmar's traceability reports for palm and laurics, Indonesia and China

Indonesia

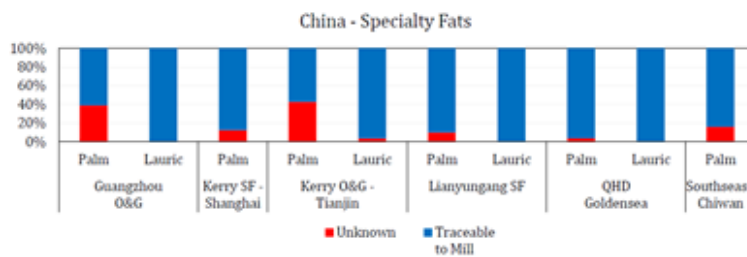


LEGEND

Refinery	Code	Refinery	Code
PT Multimas Nabati Asahan, Kuala Tanjung	MNA, KTJ	PT Wilmar Cahaya Indonesia, Pontianak	WICA, PTK
PT Multimas Nabati Asahan, Pulo Gadung	MNA, PG	PT Wilmar Nabati Indonesia, Balikpapan	WINA, BLK
PT Multi Nabati Sulawesi, Bitung	MNS, BTG	PT Wilmar Nabati Indonesia, Dumai	WINA, DMI
PT Sinar Alam Permai, Kumai	SAP, KMI	PT Wilmar Nabati Indonesia, Gresik	WINA, GSK
PT Sinar Alam Permai, Palembang	SAP, PLG	PT Wilmar Nabati Indonesia, Padang	WINA, PDG
PT Usaha Inti Padang, Padang	UIP, PDG	PT Wilmar Nabati Indonesia, Pelintung	WINA, PLT
PT Wilmar Cahaya Indonesia, Cikarang	WICA, CKR		

In total, there are 10.34 million metric tonnes (mt) of crude palm oil (CPO) and 1.35 million mt of palm kernel oil (PKO) from its Indonesian refineries that are traceable at least to mills.

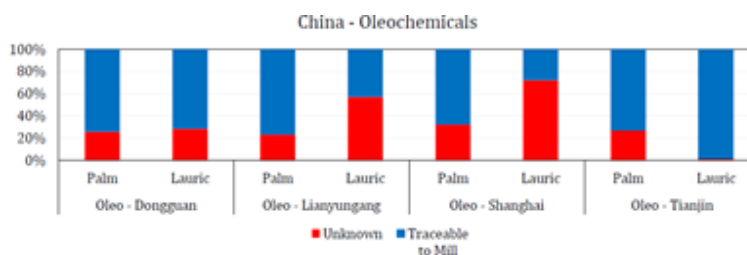
China



LEGEND

Refinery	Code
Yihai (Guangzhou) Oils & Grains Industries Co., Ltd	Guangzhou O&G
Kerry Speciality Fats (Shanghai) Ltd	Kerry SF - Shanghai
Kerry Oils & Grains (Tianjin) Ltd	Kerry O&G - Tianjin
Yihai (Lianyungang) Speciality Fats Industries Co.,Ltd	Lianyungang SF
Qinhuangdao Goldensea Specialty Oils & Fats Industries Co., Ltd	QHD Goldensea
Southseas Oils & Fats Industrial (Chiwan) Ltd	Southseas - Chiwan

In total, there are 0.98 million mt of palm products and 0.02 million mt of lauric products entering the above refineries in China that are traceable at least to mills.



LEGEND

Refinery	Code
Wilmar Oleochemical (Dongguan) Co., Ltd	Oleo - Dongguan
Wilmar Oleochemical (Lianyungang) Co., Ltd	Oleo - Lianyungang
Wilmar Oleochemical (Shanghai) Co., Ltd	Oleo - Shanghai
Wilmar Oleochemical (Tianjin) Co., Ltd	Oleo - Tianjin

In total, there are 0.33 million mt of palm products and 0.04 million mt of lauric products entering the above refineries in China that are traceable at least to mills.

Source: Wilmar Traceability Country Statistics Q1 2019.

Appendix A2: DCE⁸³ Designated Delivery Warehouses (Tank Farms, Warehouses and Factory Warehouses) for RBD Palm Olein

No.	Name	Address	Postcode	Contact	Tel.	Delivery Area	Delivery Warehouse on Par (Yes/No)	Premium and Discount (CNY/MT) Compared with Delivery Warehouse on Par	Contractual Capacity (MT)
1	Taizhou Guochuan Port Co., Ltd.	45 West Tongjiang Rd., Taixing Economic Development Zone, Jiangsu Province	225404	Li Long	0523-87671657 0523-8767129(F) 13812490696	Tank Field	No	50	10000
2	Wilmar (Shanghai) Biotechnology Research and Development Center Co., Ltd.	118 Gaodong Rd., Pudong New Area, Shanghai	200137	Ren Zhe	021-31197013 021-68467908(F) 18621681299	Tank Field	No	50	10000
3	Jinguang Food (Ningbo) Co., Ltd.	1 North Huanghe Rd., Beilun District, Ningbo, Zhejiang Province	315800	Zhang Yun	0574-86886932 0574-86886931(F) 13906693639	Tank Field	No	50	10000
4	COFCO Xinsha Grains & Oils industries (Dongguan) Co., Ltd.	Xinsha Port Industrial Zone, Mayong Town, Dongguan, Guangdong Province	523147	Chen Sulan	0769-81257476 13928922223 0769-88236050(F)	Tank Field	Yes	0	30000
5	Sinograin Oils Industry (Dongguan) Co., Ltd.	Xinsha Port Industrial Zone, Mayong Town, Dongguan, Guangdong Province	523147	Jiang Baodong	0769-88236688-1193 0769-88230288(F) 13829192702	Tank Field	Yes	0	40000
6	Yihai (Guangzhou) Grains & Oils Industries Co., Ltd.	2 Dongjiang Avenue, Guangzhou Economic and Technological Development Zone	510730	Yu Ping	020-82208122 020-82089791(p) 13826117915	Tank Field	Yes	0	30000
7	Sinograin Zhenjiang Grains & Oils Co., Ltd.	Liangshan Village, Jianbi Town, Zhenjiang, Jiangsu Province	212006	Guo Hongfeng Zhang Jie	0511-81996632/44 0511-81996630(F) 15051118866 13861350613	Tank Field	No	50	20000
8	COFCO Eastsea Oils & Grains Industries (Zhangjiagang) Co., Ltd.	1 Donghai Rd., Jin'gang Town, Zhangjiagang, Jiangsu Province	215634	Wang Yinfang	0512-58389121 0512-58388235(F) 13115110095	Warehouse Area	No	50	10000
9	Kerry Grains & Oils (Tianjin) Co., Ltd.	95 Jinbin Avenue, Tianjin Port Bonded Zone	300461	Liu Fuchun	022-66271665 022-66271187(F) 13752718639	Tank Field	No	100	10000
10	Dongguan Cargill Grains & Oils Co., Ltd.	Xinsha Port Industrial Zone, Mayong Town, Dongguan, Guangdong Province	523147	Bao Yijie	0769-82661731 0769-88239556 (F) 15622280377	Warehouse Area	Yes	0	20000
11	Jiangsu River & Ocean Cereals and Oils Group Co., Ltd.	1 Baodao Rd., Jin'gang Town, Zhangjiagang, Jiangsu Province	215634	Xu Wen	025-84798199 02584799258 (F) 13906249916	Warehouse Area	No	50	20000
12	Cargill Grains & Oils (Nantong) Co., Ltd.	1 Tongxing Rd., Nantong Economic and Technological Development Zone, Jiangsu Province	226009	Zhou Bin	0513-85966703(O) 0513-85966703(F) 13811170634	Warehouse Area	No	50	20000
13	Chinatex Edible Oil (Tianjin) Co., Ltd.	68 Dongfang Avenue, Tanggu Bonded Zone, Tianjin	300461	Chen Jiguo He Jianpeng	022-66272182/276(O) 022-66272285(F) 13602186480 13752714481	Warehouse Area	No	100	40000
14	COFCO Excel Joy (Tianjin) Co., Ltd.	510 Bohai No.40 Rd., Lin'gang Economic Zone, Binhai New Area, Tianjin	300452	Xu Li	022-25618208 022-25618209 (F) 13602031376	Warehouse Area	No	100	30000
15	Sinograin Oils (Tianjin) Co., Ltd.	29 Haibin No.6 Rd., Tianjin Port Free Trade Zone, Tianjin	300461	Li Ling	022-66275096(O) 022-66271975(F) 13820205822	Warehouse Area	No	100	20000

Note: The contractual capacity refers to the minimum guaranteed warehouse capacity in the agreement signed by the delivery warehouses with the Exchange. The actual storage of goods by a delivery warehouse may exceed the contractual capacity.

⁸³<http://www.dce.com.cn/DCE/resource/cms/2017/05/ZDCE%20Palm%20Oil%20FuturesTrading%20Manual.pdf>

List of Designated Delivery Warehouses for DCE RBD Palm Olein (Factory Warehouses)

No.	Name	Address	Postcode	Contact	Tel.	Maximum of Warehouse Receipts on Par	Daily Delivery Speed (MT/Day)	Delivery Warehouse on Par (Yes/No)	Premium and Discount (CNY/MT) Compared with Delivery Warehouse on Par
1	Tianjin Longwit Grains & Oils Industries Co., Ltd.	136 Haibin No.5 Rd., Tianjin Port Bonded Zone	300461	Yang Yuwei	022-25764808 022-25764725 13820819160	30000	2000	No	100
2	East China Oils Industry (Taixing) Co., Ltd.	12 Yanjiang Rd., Taixing Economic and Technological Development Zone, Jiangsu Province	225404	Zhou Tao	0523-87679332 13852885897 0523-87679353	9000	600	No	50
3	Yizheng Fangshun Grains & Oils Industries Co., Ltd.	3 Yougang Rd., Yizheng, Jiangsu Province	211900	Wen Ruifeng	0514-83299628 0514-83299605(F) 13773360371	12000	800	No	50
4	Jingjiang Longwit Grains & Oils Industries Co., Ltd.	68 Yue Huaidai, Anning Village, Xin'gang Industrial Park, Jingjiang Economic Development Zone, Jiangsu Province	214500	Yang Yuwei	0523-84228416(O) 0523-84228422(F) 13641570858	18000	1200	No	50
5	Guangzhou Zhizhiyuan Grease Industry Co., Ltd.	Xin'an Industrial Park, West Wanhuan Rd., Wangqingsha Town, Nansha District, Guangzhou	511462	Ma Yixiang	020-87520888 020-85506263 (F) 15922116937	15000	1000	Yes	0

Part 2

Introduction

Part 2 of the “Indonesia-China Sustainable Palm Oil Final Report,” looks deeper into the issue of gender in palm oil, China trade issues and deals, and updates on Trase data for 2018. The period of study was January to mid-March 2020. It was added following feedback on part 1.

Methodology and Data

Module 1: Gender perspectives.

Key gender equality issues related to, for example, the differing roles of women and men in palm oil plantations were identified from a desk review of selected reports. These issues were then compared against the information provided by selected plantation companies in their respective Sustainability Reports to determine how the companies address gender equality issues. The relevant ratings from SPOTT (2019) were also obtained as supplementary data.

Module 2: China trade deals and issues.

A combination of desktop research and interviews with trade experts was used to review the relevant China trade deals and issues, including how the Belt & Road Initiative could potentially affect the Indonesian palm oil industry.

Module 3: Large plantations and China business connections.

Indicators regarding the revenue and assets in China for key plantation groups were obtained from annual reports, company websites, and sustainability reports. The data was then supplemented with interviews with plantation and trade specialists.

Module 4: Indirect investment, and Chinese capital flow to the Indonesian palm oil industry.

Data from Forest and Finance (2019) was obtained to understand the flow of indirect investment from China to the Indonesian palm oil industry. The information was then broken down to feature financing received by Indonesian-linked plantation companies specifically from China financial institutions and for the palm oil commodity.

Module 7: RSPO premia and its drivers.

Analysis of the different premiums to China, to the EU and to other global buyers have been done with reference to the author’s previous interviews with traders and experts for previous publications (see References) and data for mid-2019 in the main report of this study. Interviews with sustainability, trade and other experts were done in February and March 2020 for this report addendum.

Module 8: Environmental and social risks in export regions.

The Proforest internal reports (Proforest 2020a, Proforest 2020b) on social and environmental risks by province were reviewed and supplemented with relevant information obtained from selected academic literature. These were viewed by province, with key indicators for palm exports by region (Trase 2020) and against production area (with data from Indonesian Directorate General of Estate Crops, 2018).

Module 9: Trase data.

The 2013/2014 Trase data in the main report was updated with data up to 2018 from Trase. A review of 2013 and 2018 volumes for top Indonesian-China last exporters/first importers (selected based on 2018 volumes) was analysed.

Module 10: Findings and recommendations.

This section recaps major findings from seven segments of this Report Addendum. It reviews the key question of sustainable palm oil in formal trade deals with two Indonesia palm and trade experts. Recommendations centre on voluntary initiatives and were drafted from the author's 12 years of experience in observing and analysing palm sustainability in consultation with Proforest's specialists.

Key data sources used in this report are primarily from publicly available and official sources, supplemented with interviews with selected experts familiar with Indonesia-China trade flows. Information and data sources used in this report:

- Company reports - primarily Annual Report, Sustainability Report
- Forest & Finance dataset
- Trase data set (based on bills of lading, palm oil equivalent volume trade)
- SPOTT rankings
- Interviews - on market intelligence, RSPO premia and trade issues; and
- From other references (see References).

Data limitations arise on likely inconsistency of coverage of volume, financial, and indicators by corporate groups. We have used multi-barrelled group names to be a more descriptive umbrella reference (e.g., RGE-Apical-Asian Agri). Please refer to Table M1 to see companies and group names.

This report addendum builds a picture of selected key groups (GAR-Sinar Mas, Musim Mas, RGE-Apical-Asian Agri and Wimar) from different data sets. It is possible that group compilations in the Forest & Finance dataset (there are some obvious questions about gaps therein too) and Trase (group consolidation based on author's estimates) do not cover the groups in exactly the same way, so there is inevitable uncertainty in the analysis and findings, although there has been effort to validate with interviews with market specialists.

Table M1. Plantation groups and their business units.

Group name in this report	Annual & Sustainability Report	From Forest & Finance	From Trase (units referred include)
GAR-Sinar Mas	Golden Agri-Resources Ltd	Sinar Mas Group	Sinar Mas Agro Resources And Technology, Ivo Mas Tunggal, Binasawit Abadi Pratama, Purimas Sasmita, Sinar Meadow International Indonesia, Golden Agri International
Musim Mas	Musim Mas	Musim Mas Group	Intibenua Perkasatama, Musim Mas, Wira Inno Mas, Megasurya Mas, Sukajadi Sawit Mekar, Agro Makmur Raya, Inter-Continental Oils & Fats
RGE-Apical-Asian Agri	Asian Agri	Royal Golden Eagle Group	Riau Andalan Pulp & Paper, Kutai Refinery Nusantara, AAA Oils & Fats, April Far East Malaysia Sdn Bhd, Sari Dumai Sejati
Wilmar	Wilmar International Ltd	Wilmar Group	Multimas Nabati Sulawesi, Multimas Nabati Asahan, Wilmar Nabati Indonesia, Sukajadi Sawit Mekar, Wilmar
Best Industry Group	..	Best Group	Berlian Eka Sakti Tangguh, Berkah Emas Sumber Terang, Batara Elok Semesta Terpadu
Genting Plantations	..	Genting Group	-
Harita-Bumitama-IOI	..	Harita Group	-
Jardine-Astra Agro i	..	Jardine Matheson Group	Tanjung Sarana Lestari, Kreasijaya Adhikarya
Jardine-Astra Agro with KL Kepong	..	(not relevant, as this is a joint venture)	Astra-KLK
KL Kepong-Batu Kawan	..	Batu Kawan Group	Steelindo Wahana Perkasa
Permata Hijau			Nagamas Palmoil Lestari, Permata Hijau Palm Oleo, Permata Hijau Sawit, Nubika Jaya, Virgoz Oils And Fats

Salim-Indofood-Indoagri	..	Salim Group	Salim Ivomas Pratama
Sime Darby Plantations	Golden Hope Nusantara, Sime Darby
Surya Dumai-First Resources	..	Surya Dumai Group	Adhitya Serayakorita, First Resources
Tianjin Julong	..	Tianjin Julong	Singapore Julong International Investment

Note: Group names used in this report aim to be a wider descriptive umbrella reference. “..” are not covered (as not among the core groups reviewed in more detail in section E3 of this report addendum).

Diagrams and Tables

Table E1a: Gender issues for Indonesian plantations and how companies address them

Table E1b: Key indicators and Indonesian plantations

Table E3a: Indicators regarding revenue and assets in China for key plantation groups

Figure E4a: Financing indicators and Indonesian plantations, 2011-2019

Figure E7a: Cost (estate-farmer) and premia indicators for RSPO and ISCC

Table E8a: Key export regions and palm oil provinces rated for social and labour issues

Table E8b: Key export regions and palm oil provinces rated for environmental issues

Figure E8a: Indonesia provinces rated for social and labour issues

Figure E8b: Indonesia deforestation weighted for biodiversity value

Table E9a: Indonesia Key Ports and Exporters for China Palm Product Trade

Table E9b: China Key Ports and Importers for China Palm Product Trade

Figure E9a: Top Indonesia-China traders

Figure E9b: Indonesia-China origin regions

Figure A2a: SPOTT rating (community, land, & labour rights) for selected plantation groups, Oct 2019

Figure A3a: China financial institution funding for the top five plantation groups, 2011-2019

E1 Gender perspective

This section explores the current status of gender equality issues in the production of palm oil in Indonesia. Estimates on workforce participation in key plantation groups are taken from sustainability or other company reports, with further reference to labour reports by NGOs and relevant academic literature. The next steps to move towards a more gender sensitive and/or transformative approach are also discussed.

NGO reports and academic literature have pointed out significant gender inequality issues in the Indonesian palm oil sector. These include: (1a) women predominantly as temporary workers and casual daily labourers; (1b) women workers denied pensions and other benefits, including menstrual and maternal leave, partly due temporary/casual work status; (2) lack of adequate protection for female workers; women are usually given plant maintenance tasks, such as spraying pesticides and spreading fertilisers without adequate protective measures, which exposes them to harmful chemicals; and (3) unpaid assistance in palm oil production from family members, including women and children.

In 2016, Amnesty International's report on labour issues on Indonesian palm plantations that provided palm oil to Wilmar International explained further: (1) a majority of women were employed as casual daily labourers, with little to no opportunities to be made permanent workers. These women are thus excluded from medical insurance schemes and pensions and are more vulnerable to abuse such as sudden termination or arbitrary pay cuts for failing to reach targets; (2) casual daily labourers were denied sick and maternity leave. They also face obstacles to obtaining menstrual leave—workers must be medically approved to be in menstrual pain by doctors, who were often male; (3) some plantations failed to provide its plantation maintenance workers adequate safety equipment; and (4) many casual daily labourers were already engaged in physically demanding work in the plant maintenance units. Most take up additional work by assisting their harvester husbands after their own shifts, additional work for which they are not compensated.

Since then, it appears that major plantation groups are attempting to respond (key issues and responses summarised below). We reviewed recent sustainability reports by large integrated plantation groups, for selected major issues.

Table E1a: Gender issues for Indonesian plantations and how companies address them

Issue identified by selected reports	GAR-Sinar Mas Sustainability Report 2018	Musim Mas Sustainability Report 2018	RGE-Apical-Asian Agri Sustainability Report 2018	Wilmar Sustainability Report 2018
Issue #1a - women predominantly as temporary workers and casual daily labourers	Interested fixed-term workers who wish to become permanent staff subject to meeting the required criteria for the job.	Dec 2018, 5% of workers were temporary, under short-term contracts. They are eligible for permanent employment provided they have worked for three months under the contract.	n/a	As of December 2018, 90.4% of workers have permanent employment status.
Issue #1b - women workers denied pensions and other benefits (e.g., menstrual and maternity leave), partly due to temporary/casual work status	Full-time workers & families receive free healthcare. They also have housing, basic necessities, and free education for children. Part-time workers receive free medical services, free education for their children at estate schools.	Insurance is provided to temporary workers.	Women workers are given paid maternity leave. Daycare centres are provided near housing complexes for workers with preschool children.	In Central Kalimantan, where all workers are permanent, women receive maternity benefits. Applications for menstrual leave have been made easier and less intrusive. All benefits and subsidies paid out to women are equal to men.
Issue #2 - occupational health & safety - adequate protection equipment for female workers (often given plant maintenance tasks, with pesticides and fertilisers, which exposes them to harmful chemicals)	PPE is required. Workers exposed to potential health and safety hazards undergo special medical check-ups.	Policy requirements and procedures on PPE during pesticide applications are implemented. Workers handling chemicals attend regular training and free medical check-ups.	PPE is required. Workers regularly exposed to chemicals are provided medical check-ups. Breastfeeding workers are not allowed to work in environments involving the use of chemicals.	Workers handling chemicals are required to undergo regular training. PPE is compulsory. Showering is mandatory after every shift; shower facilities are provided at each site.
Issue #3 - unpaid assistance from family members, including women and children	n/a	n/a	n/a	n/a

Note: PPE = personal protective equipment. Sources: Amnesty International (2016); Bissonnette (2013); CIFOR (2018); Elmhirst et al. (2017); ILO et al., (2019); Kinly (2015); Proforest (2020a, Internal circulation).

The plantation groups also provided data on women in their workforce. This information is briefly summarised in Table E1b below. The major findings are: (1) In general, women were approximately one quarter of the estate and mill workforce; and (2) In some companies, a substantial number, or 75-92%,

of its women workers are in temporary employment. Wilmar, GAR-Sinar Mas, and Musim Mas point out that women in the workforce prefer a more flexible work arrangement to cater to family commitments, resulting in a majority of less than full-time employment. This is due to women having disproportionate unpaid care responsibilities (childcare, domestic work, looking after elderly and sick family members, etc.).

Table E1b: Key indicators and Indonesian plantations

Key indicators	GAR-Sinar Mas	Musim Mas	RGE-Apical-Asian Agri	Wilmar
Mature hectares	475,000 (a)	C. 108,552 (approx. 89% of 121,968 of total planted area) (c)	105,231 (total plantation area) (b)	196,756 (includes sugar cane plantations)
No. of workers (plantation, mill, etc.)	102,303 (d)	20,902	22,630	34,673
Permanent workers (all genders)	62,128 (61%) (d)	19,859 (95%)	8,962 (40%)	31,335 (90%; 100% Central Kalimantan, Sumatra & West Kalimantan in progress)
Temporary workers (all genders)	40,175 (39%) (d)	1,043 (5%)	13,668 (60%)	3,338 (10%)
No. of female workers	32,618 (d)	5,639	c. 6,325	8,725
Female workers (temporary only)	16,387 (50%)	n/a	c. 5,877 (c. 93%)	n/a
Salary disparity (average female/male salary)	Workers (n/a); Staff (1.04); Mid, senior management (1.03, 1.04)	n/a	n/a	n/a
Policy - International labour standards (SPOTT) (e)	UN Declaration of Human Rights, Free, Prior, and Informed Consent (FPIC), RSPO	UN Declaration of Human Rights, Free, Prior, and Informed Consent (FPIC), RSPO + UN FAO Voluntary Guidelines on the Responsible Governance of Tenure	UN Declaration of Human Rights, Free, Prior, and Informed Consent (FPIC), RSPO Principles and Criteria 2018	UN Declaration of Human Rights, Free, Prior, and Informed Consent (FPIC), RSPO Principles and Criteria 2018 (f) + ILO Conventions
SPOTT rating For community, land, &	Policy: 23 / 25 (92%)	Policy: 20 / 25 (80%)	Policy: 18 / 25 (72%)	Policy: 23 / 25 (92%)

labour rights (g) and average of 6 gender issues	Practice: 9.8 / 16 (61%) and Gender: 83% (h)	Practice: 9.3 / 16 (58%) and Gender: 17% (h)	Practice: 13.7 / 16 (85%) and Gender: 58% (h)	Practice: 8.3 / 16 (52%) and Gender: 83% (h)
Governance - women's participation in decision making structures	OHS committees at each plantation or mill. Sustainability Committee, gender committees with labour unions and GAR management.	Gender Committees at palm oil estates. Safety, Health, and Environmental Quality Committees (chaired by highest company personnel, meets quarterly, reports to Ministry of Manpower)	Gender equality committee, OHS committees at each management unit, i.e. mills and estates.	Women/Gender Committee at each estate; crèche (quality) sub-committee at Women's Committee "rolled out across Wilmar's operations in 2019"
Programmes on labour with external parties	Indonesian Commission for Human Rights (Komnas HAM), ILO, Nestle, Verite, the Sustainable Palm Oil Initiative (SPOI)	Decent Rural Living Initiative (DRLI)	Indonesian Worker Union, badan Kerja Sama Perusahaan Perkebunan Sumatera (BKSPSS)	Forum for the Future, Business for Social Responsibility (BSR), Verite

Notes: OHS = Occupational Health and Safety, n/a - data not available; (a) As of 31 March 2019, (b) From RGE-Apical-Asian Agri Sustainability Report 2018, (c) From Musim Mas Sustainability Report 2018, (d) Includes all employees of all levels, (e) Due the variety of reporting styles of company statements, we relied on a more standardised assessment from SPOTT, which rates companies based on the transparency of their policies, operations, and commitments to environment, social, and governance best practice; readers should refer to the respective company sustainability reports for a more comprehensive list of adopted labour standards, (f) The RSPO Principles and Criteria 2018 aims to ensure adequate protection is afforded to workers and their families on plantations in line with international and local standards, such as standards set by the ILOT and UN SDGs, (g) SPOTT rating is for community, land, and labour rights; most of the issues assessed under this category deals with workers' rights—out of the 38 issues assessed, 25 were related to labour issues; six issues were related to women/gender, (h) SPOTT rating is for the companies' organisation, policy, and practice of the issues relating to gender.

Summary of findings:

- The number of temporary workers for Wilmar and Musim Mas are considerably low (at 9.6% and 5% respectively). Temporary workers comprise more than half of the workforce at GAR-Sinar Mas and RGE-Apical-Asian Agri, with a significant majority of women workers (about 75% and 93% of women workers respectively) on temporary status. According to FAO (2019), it is the norm within the Indonesian agricultural sector that women are more likely to work as unpaid workers in the informal sector and/or engage in casual/part-time work compared to men. Broadly, data is incomplete on the number of temporary women workers and salary disparities based on gender.
- Women governance is improving with the formation of women's rights and/gender equality committees at some estates. Occupational Health and Safety (OHS) committees are also largely in place to enforce safety protocols and standards.
- According to SPOTT, all four plantation companies have reported adoption of several international labour standards. The UN Declaration of Human Rights and Free, Prior and Informed Consent (or FPIC) are the most consistent standards adopted. Some have also adopted additional labour standards, such as Wilmar on the ILO Conventions.
- There is a difference in ratings for policy (higher) and practice (lower) of labour standards, according to SPOTT. On crafting labour policies, ratings range 72% to 92%. But ratings for the practice of these policies ranged 52% to 61% with an exception of 85% for RGE-Apical-Asian Agri. Reading deeper, we note that the rating has a focus on data disclosure rather than the actual metrics at this point. While RGE-Apical-Asian Agri rates better on data transparency (than peers), 60% of its workers were temporary (worse than selected peers), and 93% of these were women.
- Focussing on six rating items that specifically refer to gender (on inclusion of women, addressing barriers and eliminating discrimination within operations and with all suppliers; reporting the percentage of women employees, and salary by gender), the simple average of the ratings put Wilmar and GAR-Sinar Mas at joint highest, followed by RGE-Apical-Asian Agri and Musim Mas (with more "no answer" items; see more in Annex 2).

E2 China trade deals and issues

Trade issues and deals for China that are related to palm oil include the relationship with soybean imports for protein and the potential impact of the Belt & Road Initiative and influence on Indonesia's palm oil policy. We then look at how China's palm oil (refined) imports are covered by NDPE rather than the RSPO.

The Belt & Road Initiative of China and links to Indonesia policy on palm oil

- We interviewed two Jakarta-based senior trade specialists, one deeply familiar with palm oil and the wider political economy and the second a China-Indonesia specialist at a think tank. We also reviewed a recent paper by think tank Centre for Strategic and International Studies (CSIS).
- Palm oil and political-economy expert. "BRI is on hold because of the coronavirus, and there is a difference of opinion among the policy makers - the ministers. There are some who are close to China and those who are not." This regards air traffic, tourism, and trade restrictions during the time of virus and more. Longer term, the key projects for BRI in Indonesia is the high-speed railway Jakarta-Bandung and several projects in Sulawesi and the 2019 MOUs with China about big contracts (Tarahita and Rakhmat, 2019). For palm oil, note that China increased its volume in 2019, to become the number one market for Indonesia (19% of total exports), up from number three (behind India and the EU): 6.1 million tonnes CPO and products from Indonesia, which is a lot compared to India's 5.1 million and the EU's 5.7 million tonnes. But that is due to special reasons in 2019 (trade war, swine fever). BRI is more about physical infrastructure, while trade issues (like palm oil) are separate. BRI investments in infrastructure are also not specific to palm oil. But we can see our economic interests converging. Recently, there was some attention on Natuna/South China Sea but that is cooling. We do not think it will affect China investment and trade. China was restrained about its reaction with Indonesia on this, while they reacted stronger to the Philippines. So, Indonesia is in a favoured position with China. Also note in May 2018, "Premier Li Keqiang has especially agreed to increase [Indonesia's] palm oil exports to China by up to 500,000 tons [per year]." (Sapiie, 2018).
- "Perceptions and Readiness of Indonesia towards the Belt and Road Initiative," by CSIS Indonesia (2019) reports that BRI's focus is on infrastructure development and connectivity and that three provinces have been selected by the Indonesia central government as the main destinations of BRI investment, i.e., North Sulawesi, North Kalimantan and North Sumatera: (1) North Sulawesi has, for instance, a potential to become a tourism hub, especially for those who want to visit eastern Indonesia. Manado, the capital of the province, is only about five hours by air from Beijing, Chongqing, and Chengdu. What is lacking at the moment is supporting infrastructures; (2) As for North Sumatera, it has an abundance of natural resources, palm oil and rubber in particular. In fact, the government has established Sei Mangkei Special Economic Zone near Medan proposed specifically to become a centre for palm oil-based and rubber-based industries; and (3) North Kalimantan is rich in natural resources, especially minerals but also water for hydropower. While it is one of the richest provinces in terms of natural resources, yet the region is relatively underdeveloped. CSIS notes that Chinese investment in agriculture is particularly low.
- Think tank specialist. BRI's major projects are for infrastructure, to promote trade and investment. China has offered construction material that needs to be flown abroad (a short-term objective) to feed its long-term objective for trade and investment. Palm oil is an important factor, as Indonesia is the largest producer and exporter. Some BRI projects may benefit the

trade of palm oil; these are deals for projects under discussion, and for many we cannot yet identify a specific location. The promotional talk is that these are business-to-business deals. They say this to minimise negative sentiment toward China that is quite widespread in Indonesia. In reality, recent China projects plans were signed by Indonesian government representatives, and not by private business entities. It is a government-to-government relationship. Indonesia has had a troubled relationship with the EU more recently. As China gets closer, Indonesia sees China as an alternative partner, including for palm oil. Domestically, there is a lot of criticism, as Jokowi is seen as favouring FDI and not domestic direct investment; the Omnibus law (to promote FDI) is due in 2020, and we await a timeline.

Multi-lateral relations

Some examples of Indonesia's multilateral relations with major countries:

- 1) Indonesia-the United States: The United States is one of Indonesia's largest trading partners and investors. The commodity export to the United States and investments from the United States are of great significance for Indonesia's economic growth. In a phone call to President Trump, President Joko Widodo once pointed out that Indonesia has been ready to deepen its mutually beneficial relationship with the United States and the United States is also highly interested in investing in Indonesia's infrastructure, ports, agriculture and other fields.
- 2) Indonesia-Japan: Japan has established a very close economic and trade partnership with Indonesia, and it is also one of Indonesia's important investors. In 2016, Japanese enterprises directly invested USD 4.5 billion in Indonesia, ranking the second largest investor to Indonesia, only after Singapore. Japan has lent a large number of loans to Indonesia and has been Indonesia's largest creditor for the past 40 years. After President Joko Widodo took office, Japan signed a memorandum of understanding with Indonesia, and strengthened and increased its investment in Indonesia's labour-intensive industries such as agriculture.
- 3) Indonesia-Australia: Indonesia is geographically close to Australia and has a large population, and Australia has long regarded Indonesia as one of its partners. Recently, Australia has been increasing its assistance to Indonesia and enhancing its support for maritime cooperation with Indonesia and infrastructure construction.

Conclusion: In 2019, China became Indonesia's largest export market for palm oil products, with 6 million tonnes of palm oil and its derivatives (excluding oil chemicals and biodiesel products) exported from Indonesia to China. Therefore, both sides have broad scope for cooperation in the palm oil and its derivatives industry. In order to attract more Chinese investment and trade activities in Indonesia, the governments of both sides could learn from the existing cooperation model between Indonesia and other major countries, and promote the full-chain cooperation in fields of infrastructure, ports and agriculture. Both sides could have more conversations on economic and trade development and sign memorandums of understanding in various fields. China could potentially provide more support to Indonesia's infrastructure and deepen the partnership. Chinese state-owned enterprises might actively explore more cooperation on Indonesia's palm oil and other products at the source, establish long-term and stable supply relationship with Indonesia, and strengthen the strategic cooperation between domestic enterprises and local producers.

Trade volume flux - swine fever and trade war in 2019, Coronavirus and trade deal in 2020

- The surge of palm oil imports in 2019. Chain Reaction Research (2019) pointed out that China was set to see its highest annual rate of palm oil import in 2019. China's import of palm oil increased, while its import of soybean decreased. This trend was due to relatively weaker palm oil prices compared to soybean prices, as well as reduced demand for soymeal as hog feed, following the outbreak of African swine fever in 2018-2019.
- UNDP (2020) talks about the market concentration of imports by large-vertically integrated agrifood companies. Its 2016 references points to Yihai Kerry (Wilmar) and Cargill as two among the top 10 traders and Customs data showed the ports of Nanjing, Huangpu, and Tianjin handling a majority of the palm oil imports.⁸⁴ Imported products were mostly used for food and in smaller amounts for cosmetics, cleaning products and biofuel.⁸⁵
- The US-China trade war and farm product deal. In the Phase 1 deal, Donald Trump asserted that China has promised to buy USD40-50 billion of US farm products each year. This is a substantial increase from the recent trade of about USD20 billion. As soybean is the dominant farm product traded, there is some worry from palm oil makers that China will have to reduce the amount of palm oil demand. While there was concern whether China had agreed to this (early on it was silent on the value of this deal term, and said it depends on US farm product quality and other commercial terms), trade watchers now seem positive that China will comply with this. They note recent adjustments that unlock China for imports of US beef, pork, poultry, pet food and more. "China has been particularly reassuring on the agriculture side of the deal. They realise the political importance of this to Trump," said Jarrett, a former US diplomat in China and Hong Kong (Bray and Bermingham, 2020).
- Palm oil consumption rates. UNDP (2020) reports that the consumption of imported palm oil has risen due to increase in population, urbanisation, and higher incomes. In the medium term, UNDP identifies the competitiveness of palm oil against other oils, the availability of edible oils in China as well as the US-China trade war as the factors that may have contributed toward the growth in palm oil consumption.
- Coronavirus affecting supply chains. Since emerging in Nov-Dec 2019, the coronavirus has been a rising worry. There was the Lunar New Year eve, February 2020 lockdown of Wuhan and nearby cities for several weeks that expanded; but China is now getting back to work. Supply chains and commodity trading were affected, but China is seen to have prioritised food among other essential goods. But Indonesia palm oil shipments were reportedly affected, and some China importers invoked 'force majeure' to cancel palm oil contracts. "Indonesia (by mid-February) exported 84,000 tonnes of palm oil... compared with 371,000 tonnes for the full month of February last year... and 483,000 tonnes (last month) to China (Munthe and Nangoy, 2020a).

⁸⁴ According to 2016 data cited by UNDP, the ports of Nanjing, Huangpu, and Tianjin handled 72% of imports and Guangdong was the biggest with 1.9 million tonnes of palm oil. Furthermore, in 2013 foreign investment enterprises handled 52% of total imports and Chinese private enterprises 30% and state-owned companies had 10% with a general consolidation trend. CFNA 2016 data cited points to 4.3 million tonnes or 75% of palm oil used in the food industry.

⁸⁵ According to the 2016 CFNA data, the consumption of palm oil in the food industry was about 4.3 million tonnes in 2015, accounting for 75% of China's total palm oil consumption. More than half of palm oil was used in instant noodles and processed foods, and nearly a quarter was used in household cooking products. The rest was used in washing detergents, soap, personal care, and other miscellaneous products; around 890,000 tonnes or 15% of total palm oil consumption was used in the production of these daily-use chemicals.

Forecasts of GDP impact started at 1-2 percentage points down for 1Q2020 and now there is talk of a negative quarter. The virus is spreading internationally, while it seems to have abated in China; and recent oil price shocks will be negative for the energy demand for palm oil.

With the increase of the production cycle of palm oil, the supply tends to rise. However, under the influence of the coronavirus epidemic and economic downturn in importing countries, the demand for oils and fats tends to have declined. In addition, the decline of crude oil price has a negative impact on the demand for biodiesel, and palm oil export is still under pressure. We mainly consider the impact of the coronavirus epidemic on Indonesia's palm oil imports from four aspects, namely, demand, supply, industrial use (crude oil price) and substitutes.

1) Transportation capacity and demand of China as an importing country:

During the epidemic period, Wuhan and its neighbouring cities were closed for several weeks, except for the domestic transportation of agricultural products. China released a policy to open a green channel for agricultural products, thus the logistics were effectively guaranteed. Meanwhile, from February to March, Indonesia made restrictions on international flights from China, but it only restricted the import of live animals and there were no clear restrictions on Indonesia's palm oil export.

2) Analysis of the supply capacity of exporting countries:

Indonesia's confirmed cases are mainly found in Java. Jakarta, the capital, has the most confirmed cases, accounting for nearly half of the confirmed cases in Indonesia. The places with most confirmed cases in Indonesia produce small proportion of palm oils, therefore, the impact on palm oil production is relatively small so far. But the situation in Malaysia is more complex. On March 16, the Malaysian government ordered enterprises to shut down for half a month, after which seven workers in the plantations of Sabah were confirmed to have been infected with the coronavirus. Therefore, three plantations were ordered to suspend operations until April. Large scale shutdown of plantations had a greater impact on palm oil production in Malaysia, but it also brought some opportunities for Indonesia's palm oil exports.

3) Enlightenment from the impact of special circumstances on the supply chain and palm oil supply and demand in the future:

As the impact of the coronavirus epidemic weakened, relevant industry associations can take the lead in analysing the impact of extreme or special circumstances on the palm oil market supply and demand and the trade transactions, so as to establish a long-term and stable supply relationship.

Sustainable palm oil in China

- Chain Reaction Research (2019) points out that China has purchased mostly refined products. These were covered by NDPE ("no deforestation, no peat, no exploitation") policies despite low demand for sustainability from Chinese end-users. But only one percent of imported palm oil in 2019 could be labelled as "sustainable" in line with RSPO standards. RSPO targets certified palm oil uptake at 10% by 2020, while 86% of refineries in China were covered by NDPE (but

there are few sustainability metrics as the focus since late 2013 has been on advancing traceability metrics, toward 'traceable to plantation' or TTP).

- The latest RSPO information is in its 2018 Impact Report, and reports for 30 June 2018, the physical uptake of CSPO in China at 1.5%. China has 145 RSPO members (ordinary and associates, mainly being larger and smaller) companies with 134 certified facilities; the numbers have been rising and this is necessary for more certified products to enter China.
- According to UNDP (2020), China state-owned enterprises (SOEs), are struggling to achieve the extra commitments required. The lack of economic incentives, i.e. the high premium for certified products, and the extensive procedures required to become certified often discourage Chinese entities. Nevertheless, UNDP reckons that market and non-market conditions in China are moderately favourable for sustainable palm oil. Multinationals are facilitating RSPO certification; and major trading companies along with the China Chamber of Commerce of Import/Export of Foodstuffs, Native Produce and Animal By-products (CFNA) and the China Chain Store and Franchise Association (CCFA) are creating an environment suitable for certified palm oil. In addition to market factors (population, urbanisation, higher incomes), UNDP points to the following supportive elements: market concentration in the trading segment, relative dominance of a few firms in retailing, the Chinese government's new priorities on sustainable consumption and the greening of value chains, initiatives by business associations supported by the Ministry of Commerce.
- UNDP points to reputation risk for COFCO and other Chinese SOEs that have internationalised. With regard to COFCO, the company is positioning itself to be a Chinese leader on sustainable palm oil and has set a target to receive 100% of RSPO-certified palm oil and oil palm products by 2025; while its latest palm product and certified volumes was 320,000 tonnes and 34,130 tonnes (11% certified), respectively (in its company report to the RSPO in 2019). This volume is low relative to its well-known market heft; and it may refer to direct purchases. It is uncertain how it may handle its China onshore palm purchases.
- Overall, UNDP identified five major problems for sustainable palm oil in China: (1) a relatively low degree of awareness about the implications of palm oil production and consumption, particularly on sustainability; (2) low environmental awareness; (3) price-consciousness of Chinese end-consumers; (4) local companies focus on cost performance of raw material rather than its origins; and (5) challenges in enforcing NDPE commitments in procurement given the lack of traceability of palm oil brought into China.

Major findings:

- CSIS notes that Chinese investment in Indonesian agriculture has been particularly low. There is a chance that BRI could increase this. On the other hand, with many reliable suppliers of palm oil investing in their own trade infrastructure, China may see no need to invest. Trade has not been linked to investment and this situation may persist.
- Palm oil volume from Indonesia to China saw a significant rise in 2019, making China the largest palm destination ahead of India and the EU; and breaking out from range-bound volumes in recent years.
- Volume to China is likely in a major flux from 2018, to 2019 and 2020. There is the influence of swine flu (negative soy imports, positive palm oil), low palm oil price relative to mineral oil (boosting imports for use in farm machinery and fishing vessels; but this has reversed as palm oil price surged in 2H2019 and crude oil prices have slumped in 1Q2020 with the outbreak of an OPEC or Saudi-Russia trade war), and US-China trade deal (neutral-positive palm oil if more meat is imported to China to negative palm oil if more soy is bought).
- RSPO membership is high among trader-processors for Indonesia-China trade, but they have a focus on NDPE and traceability. So, their movement of RSPO materials remains very limited and RSPO reports a 1.5% market share, up to mid-2018. Some market experts point out that NDPE will continue to usurp RSPO's market share.
- UNDP (2020) states that Chinese companies are struggling to fulfil extra sustainability commitments due to low economic incentives and extensive certification procedures. Nonetheless, UNDP sees a moderately favourable environment for sustainable palm oil in China as multinationals, major trading groups, and various Chinese agrifood associations are involved; and increased urbanisation and income should help too with consumer awareness.
- UNDP points to reputational risk for COFCO and other Chinese SOEs that have internationalised, with COFCO positioning as a leader on sustainable palm oil in China.
- Overall, UNDP identified five problems for sustainable palm oil in China and emphasise low awareness on sustainable palm oil and the price-consciousness of end-consumers.

E3 Large plantation groups and China business connections

We reviewed four large plantations groups for their business segments in revenue and assets in China. Also refer to section *E9 Trase Data* for more.

Table E3a: Indicators regarding revenue and assets in China for key plantation groups

Plantation group	Refineries and other processing - global	Refineries and other processing - China	As first importer (Tonnes, Trase 2018)	Revenue, profit, asset segment - global (annual report)	Revenue, profit, asset segment - China (annual report)	No. subsidiary, associate companies in China
Wilmar	180 refineries, 24 oleochemical, 35 specialty fats, 14 biodiesel	58 refineries, 12 oleochemical, 9 specialty fat, 0 biodiesel	146,851	FYE 31 Dec 2018, USD 44.5 billion revenue, USD 1.6 billion PBT, USD 19.4 billion non-current assets	FYE 31 Dec 2018, USD 25.0 billion revenue, USD 7.0 billion non-current assets	51 refineries, 10 oleochemical and 6 specialty fat plants via subsidiaries and 7 refineries, 2 oleochemical and 3 specialty fat plants via associates
Musim Mas	17 refineries, 9 kernel crushing, 5 oleochemicals, 5 speciality fats, 8 biodiesel	3 refineries	1,026,532	USD 7.5 billion revenue (a)	n/a	3 refineries (b)
GAR-Sinar Mas	6 refineries, 4 kernel crushing, 1 bulking station	2 refineries	559,865	FYE 31 Dec 2018, USD 7.2 billion revenue, USD 1.3 billion PBT, USD 4.1 billion non-current non-financial assets	FYE 31 Dec 2018, USD 853 million revenue, USD 107 million non-current non-financial assets	1 refinery via a subsidiary, 1 refinery via 2 levels of subsidiaries, 1 sold to Louis Dreyfus Commodities ⁸⁶
RGE-Apical-Asian Agri	5 refineries, 1 kernel crushing, 1 oleochemicals, 3 biodiesel	1 refinery	463,524	n/a	n/a	1 refinery, Nanjing Excelic (b)

Notes: Ranked by number of refineries (global). n/a - data not available, (a) From Musim Mas Sustainability Report 2018, (b) listing of subsidiaries and associated companies not publicly available (annual report, company website, and sustainability report were accessed).

⁸⁶ The sale of Sinarmas Natural Resources Foodstuff Technology (Tianjin) Co. is reflected in the GAR 2018 Annual Report. That leaves Shining Gold Foodstuffs (Ningbo) Co., Ltd as GAR's only refinery of palm and vegetable oil in China held via a subsidiary. Zhuhai Shining Gold Oil and Fats Industry Co., Ltd is held via a subsidiary of a subsidiary.

We spoke to two senior market experts on the China-Indonesia palm oil trade, one based in Jakarta and one based in Singapore and Hong Kong. The focus was more on the latter as the competitive landscape for China palm oil is less understood:

- Jakarta perspective. There has not been much change among the key Indonesia players. Indonesia's export to China is half by Wilmar (we look at the market share of cooking oil in China and see it is still dominant) and Sinar Mas is also big. The non-public listed groups are Musim Mas and Asian Agri. Other major exports for China are Surya Dumai-First Resources and Permata Hijau. Refer to E9 Trase Data for more.
- Singapore-HK perspective. We look at two categories. First, domestic consumption is dominated by the leading brand of vegetable oil by Wilmar with 40-50% market share (Aruwana brand), closely followed by 35-40% with COFCO (Fortune brand). The rest are much smaller. Second, look at imports, which Wilmar dominates with close to 50% and then COFCO with 30-40%. For major buyers, you get Wilmar again. It is doing its own supply chain feed into bottling and the same for COFCO; but there are small blenders making up the rest of 20-30%. Bagged vegetable oil, margarine, and stearin are dominated by Wilmar, Musim Mas, and RGE-Apical-AAA. They sell a lot to COFCO and supply their own plants in China. This is part of the last 20-30%. GAR-Sinar Mas also supplies margarine, but this is relatively small. China is not like India where there are so many Indian traders. Wilmar buys from the cheapest, they do not have to be the shipper. They do not have to supply from Indonesia but could buy from anyone offering the cheapest. Onshore is always cheaper for China. COFCO may not buy direct, China (state owned) agriculture traders or other companies would buy according to financing, tax, and volume-profit allocation. They do not buy fob-basis and import from Indonesia. The shipper does not name the importer who could be COFCO or Wilmar. As for the likes of Wings Group, Sungai Budi Group, Salim-Indofood-Indoagri, and Citra Nutrindo, they tend to sell speciality products.

Summary of findings:

- The direct Indonesia-China trade was dominated by Musim Mas, Gar-Sinar Mas, and RGE-Apical-Asian Agri in 2018. Wilmar moved just under 150,000 tonnes of palm material in 2018, becoming less dominant as a direct trader (compared to 2013), and it appears to buy a large part of its palm oil supplies onshore in China (refer to E9 Trase Data).
- Market specialists report that Wilmar is still dominant in palm oil in China with about 40-50% of the market, followed by COFCO with 30-40% and others account for 20-30%.
- About third of Wilmar's 180 refineries (subsidiaries and associates) are in China. For FYE Dec 2018, USD 25 billion revenue (56% of its global revenue) and USD 7.0 billion non-current assets (36% of its global non-current assets) were from China. Its website reports over 300 manufacturing plants in more than 60 China locations; making it the largest edible oils refiner and specialty fats and oleochemicals manufacturer, the leading oilseed crusher, producer of branded consumer pack oils, rice and flour, and one of the largest flour and rice millers. Recently, CGS-CIMB (2020) reports Wilmar on track to list YKA in China and its operations in China have so far not been significantly affected by the Covid-19 outbreak.
- Musim Mas has three out of 17 of its refineries in China and reports USD 7.5 million of revenue in 2018 were from China and.

- GAR-Sinar Mas reports two refineries (out of six) in China, after having sold its Tianjin refinery to Louis Dreyfus in 2017 (Reuters, 2017). For FYE Dec 2018, USD 853 million revenue (13% of its global revenue) and USD 107 million non-current non-financial assets (2.4% of its global non-current non-financial assets) were from China. It has 20 subsidiaries in China.
- RGE-Apical-Asian Agri has one of its five refineries in China.

E4 Indirect investment and Chinese capital flow to the Indonesian palm oil industry

This section analyses the flow of indirect investment from China to the Indonesian palm oil industry. The relevant dataset was obtained from Forest & Finance. This reports all plantation groups (for all commodities, i.e, palm oil, pulp and paper, rubber, and timber) as well as Wilmar, COFCO, Tianjin Julong, and ZTE, i.e. those with an Indonesia presence, were funded USD 108 billion⁸⁷ in the last 10 years, of which USD 16 billion or 15% was from China financial institutions (FIs) on a global funding basis. Forest & Finance identifies the palm oil sector⁸⁸ receiving USD 59 billion in total, with USD 2.7 billion or 4.6% from China FIs. The UNDP (2020) report on China sustainable palm oil reiterates the major role for banks (including Chinese) in giving corporate loans to big palm oil companies in Indonesia.⁸⁹

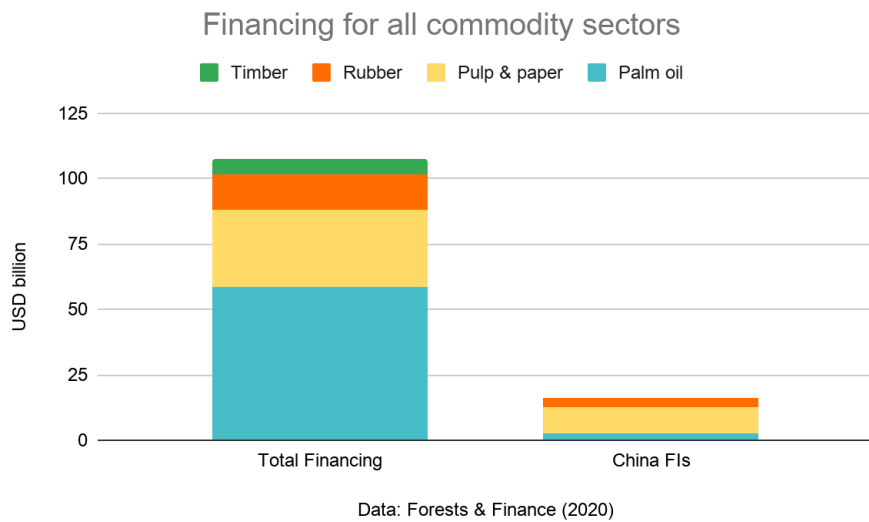
The selected groups, i.e. 10 major plantation groups including Wilmar plus COFCO, Tianjin Julong, and ZTE, had USD40 billion or 38% of the total; with USD12 billion (or 30%) from China FIs. The financing data is for January 2011 to August 2019 cumulatively in USD billion. The three charts in Figure E4a feature the selected groups: (1) Sinar Mas Group (GAR-Sinar Mas); (2) Royal Golden Eagle Group (RGE-Apical-Asian Agri); (3) Wilmar Group (Wilmar); (4) Jardine Matheson Group (Jardine-Astra Agro); (5) Salim Group (Salim-Indofood-Indoagri); (6) Harita Group (Harita-Bumitama-IOI); (7) COFCO; (8) Genting Group (Genting Plantations); (9) Batu Kawan Group (KL Kepong-Batu Kawan); (10) Surya Dumai Group (Surya Dumai-First Resources); (11) ZTE; (12) Tianjin Julong; and (13) Musim Mas Group (Musim Mas). But the data appears incomplete as funding for Wilmar seems relatively small. Yihai Kerry and the many Wilmar associates in China may have not been fully accounted for.

⁸⁷The types of funding in this dataset include bond issuance, corporate loans, revolving credit facilities, and share issuance.

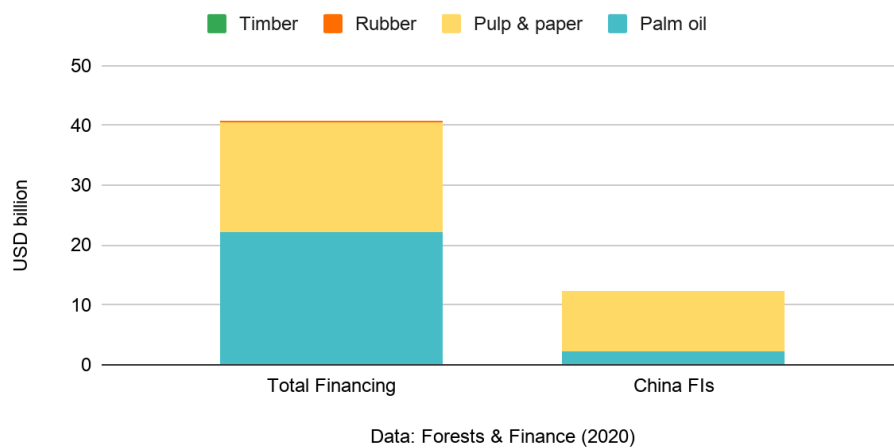
⁸⁸Forests & Finance (2020) adjusts or estimates funding for each sector and non-forest activities, and explains that "Companies with business activities outside of the forest-risk sector had recorded amounts reduced to more accurately present the proportion of financing that can be reasonably attributed to the forest-risk sector operations of the selected company."

⁸⁹UNDP (2020) reports that banks from Japan, Malaysia, China, Indonesia, Singapore, the UK, and the US have given corporate loans to major palm oil companies in Indonesia amounting to USD 15 billion between 2010 and 2016.

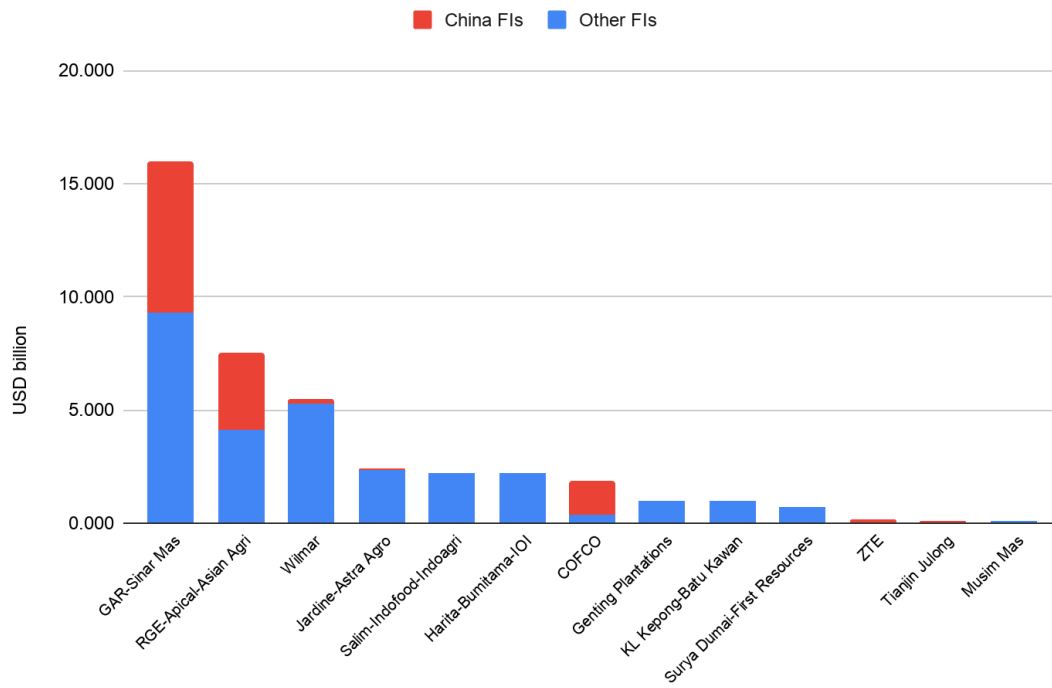
Figure E4a: Financing indicators and Indonesian plantations, 2011-2019



Financing for selected Indonesian-linked groups, all commodity sectors



Financing for selected groups, palm oil only



Data: Forests & Finance (2020)

Note: (1) Data is for Jan 2010 to Aug 2019; (2) Forest & Finance (2020) explains that sector specification is the tropical forest-risk sector production and primary processing activities, but this seems uncertain as it may be tagged to sub-groups that have more than palm oil or other commodity activities; (3) There was no financing data for Indonesia entities of COFCO (which has Jakarta and Lampung offices), Tianjin Julong, and ZTE; and (4) Wilmar data may not fully cover its China businesses and associates.

Major findings:

- China FI funding of palm oil appears limited, in general (USD 2,7 billion; 4.6% of total financing for all commodities, for all groups in the dataset) and for the selected groups (USD 2.3 billion or 10.5% for palm oil).
- China FIs notably fund the pulp and paper activities of GAR-Sinar Mas and RGE-Apical-Asian Agri in China.
- GAR-Sinar Mas received the most financing overall (USD 16 billion), followed by RGE-Apical-Asian Agri (USD 7.6 billion) and Wilmar (USD 5.5 billion), from all financiers.
- China FI funding went to GAR-Sinar Mas (USD 6.7 billion), and RGE-Apical-Asian Agri (USD 3.5 billion). There was significant funding for COFCO (USD 1.5 billion), ZTE and Tianjin Julong.
- Among the top five key plantation groups, GAR-Sinar Mas and RGE-Apical-Asian Agri received financing for the palm oil and pulp & paper commodities sectors; and financing for Wilmar, COFCO, and Jardine-Astra Agro was only for palm oil.
- Financing from China FIs make up a significantly large portion of the total financing received by COFCO (79%), GAR-Sinar Mas (42%), RGE-Apical-Asian Agri (46%). Only 4.0% of Jardine-Astra Agro's financing came from China; for Wilmar, the figure is 3.3%. See information by palm oil group (Annex 3).

E7 RSPO premia and its drivers

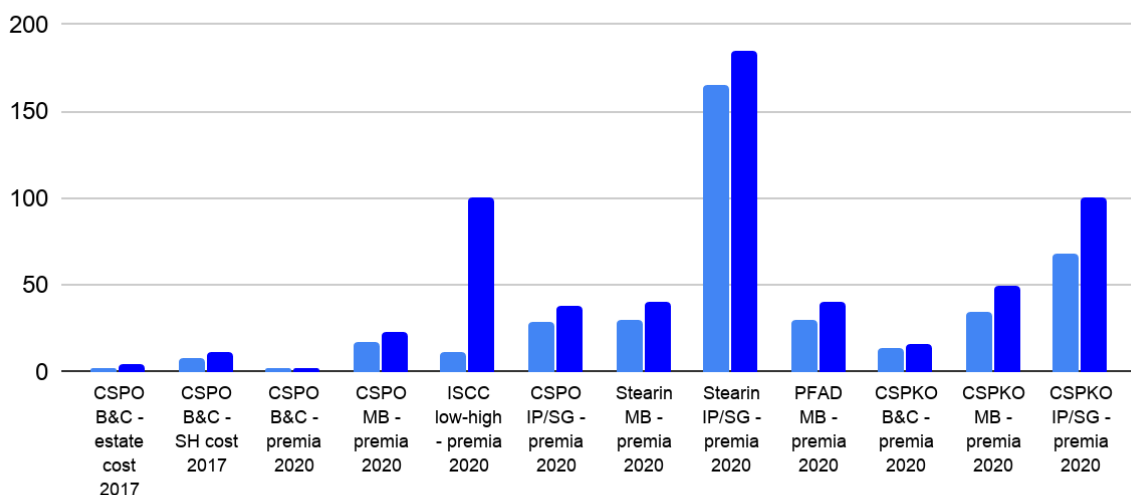
Sustainability certified products are not free, and they attract premia, as suppliers seek to cover their costs or more. The key certifications are RSPO (for food and oleochemicals) and ISCC (energy end uses, notably transport fuel). The latter is a younger certification, but it has a higher volume for palm than the RSPO. As the ISCC is only relevant for the EU Renewable Energy Directives, we should focus on the RSPO as pertinent for the global sustainable use of palm in foodstuffs and home and personal care products.

The options for RSPO certificate buyers are book & claim (B&C, also referred as credits), mass balance (MB), identity preserved or segregated (IP/SG). The first is paper trading (but most useful for smallholders) and the latter two are 'preferred' as there is a clear link with the flow of physical oil from a certified mill and supply base. IP/SG is the market leader for food products and associated with a higher quality grade; and it is also purchased by those making refined and oleochemical products as RSPO rules allow their MB volumes to be covered by an SG certificate. ISCC is on an MB basis and it is a certified sustainable palm oil (CSPO). RSPO's flagship (major volume product) is its CSPO (sold by palm oil mills), but its basic premia does not cover estate-farmer costs; while ISCC premia are seen as more attractive (especially at the high end, but less so at the low end of GHG savings).

The high RSPO premia are to be had in certificates for refined (minor volume) products and these are earned by refiners (to cover their logistical cost and more). The notable products are stearin, PFAD, and palm kernel oil⁹⁰. Recent premia (USD per tonne) are below (from interviews with traders).

Figure E7a: Cost (estate-farmer) and premia indicators for RSPO and ISCC

RSPO & ISCC premia for key palm products for early 2020 (indicative range, USD/tonne), P&C cost indicators for estate & smallholder (SH) are uncertain for revised RSPO standard



Data: Author's interviews, Feb-Mar 2020. Note: All items are RSPO unless indicated as ISCC.

To examine destination premia versus origin premia, and to find out about any differences in premia

⁹⁰The uses of notable products are: (i) stearin - a solid fraction used in pastry fats, margarines, shortening, vanaspati (also, soup dry mixes, cake dry mixes, pizza dough) soap manufacture, biodiesel; (ii) PFAD - an industrial grade palm product used in animal feed, detergents; and (iii) palm kernel oil - used in food items like chocolates and frozen desserts as a confectionary fat (along with stearin), but largely used for non-edible purposes such as making soaps, cosmetics and detergents.

for the EU, China and India for core RSPO products (CSPO and CSPKO), we interviewed four trade specialists:

- Singapore-Jakarta supplier. Premia differences are by company name, on a case by case basis. If you are RSPO and you are blacklisted, it's no use. Some RSPO members have a difficult time on issues (including those with a presence in Papua) and are accused of greenwashing. Even newer RSPO members who have left large areas undeveloped and set aside large funds find nobody dares to buy, given the NGO politics. So, their RSPO certificates are not worth much. In general, RSPO sales have not been good, as it has credibility issues. Other NGOs attack the RSPO. MB and SG certificates are key. Some suppliers are priced out as they have a mismatch in logistics, E.g., a remote plantation in Kalimantan trying to sell to Rotterdam would find its logistics cost of reaching an export port cannot be covered by the premia; and there is no use certifying for the local market as there is no demand.
- Singapore supplier. Some buyers will not just buy any RSPO product offered and they will approach a seller directly because of other reputational risks beyond RSPO commitments. So, the variations in premia are more to do with name than destination region.
- Singapore trader. There is an uptrend in premia as there are some shortages of RSPO oil. We do not see variation in premia by destination. If clients are buying RSPO MB products, Europe pays the same as Japan and India. If it is a high premia product, they all pay the same.
- Malaysia trader. Some European buyers are more price sensitive. We had those big trader-processors offering these buyers traceability instead of RSPO SG products. Sustainable "trace to plantation" or TTP undermined RSPO SG and the RSPO in general. A big European food manufacturer was buying from certain regions like Malaysia on a TTP basis and covering with RSPO B&C. They were unwilling to pay for RSPO SG material. This is more by names (and regional) than destinations. Some buyers are willing to lock in RSPO MB supplies. Some who left the RSPO for traceable options are now back to the RSPO.

Major findings:

- Sustainability certified products are not free, and they attract premia, as suppliers seek to cover their costs or more. The key certifications are RSPO (for food and oleochemicals) and ISCC (energy end uses, notably transport fuel). The options for RSPO certificate buyers are book & claim (B&C, also referred as credits), mass balance (MB), identity preserved or segregated (IP/SG).
- RSPO premia are more on a supply or cost-push basis, than on a demand-pull basis. Europe pays the same as Japan and India. If it is a high premia product, they all pay the same.
- Some buyers are more willing to pay more for better suppliers and quality specifications.
- RSPO premia differences (at origin) are by company name, on a case by case basis. If you are RSPO and you are blacklisted, it is no use. Some RSPO members have a difficult time on issues (including those with a presence in Papua) and are accused of greenwashing.
- Non-RSPO TTP strategies are apparent. Some European buyers are more price sensitive. Big trader-processors may offer these buyers traceability instead of RSPO SG products. Sustainable "trace to plantation" or TTP undermined RSPO SG and the RSPO in general.

E8 Environmental and social risks in export regions

Proforest (2020a, internal reference) assessed four social risks by province, i.e. child labour, forced labour, inadequate health and safety, and land rights abuses and disputes, at a sub-national jurisdiction level on a scale of 1 to 5, with 1 being lower risk and 5 being higher risk. Focusing on key palm oil producing provinces (mature palm oil hectares), the better ones in Sumatra (the main export region) were Bangka Belitung and South Sumatra and worse were Aceh and North Sumatra. For Kalimantan (the second largest export region), the better provinces were Central and South Kalimantan and worse were East and North Kalimantan. Production areas are limited in Sulawesi and Papua. Indonesia-wide, the worst provinces for social risk with oil palm (high ratings) were West Papua, Papua, Central Sulawesi, Aceh and the best included Bangka Belitung, South Sumatra, Jambi and Riau.

Proforest (2020b, internal reference) assessed environment risks by province, i.e. area converted to oil palm, planted area controlled by smallholders, oil palm expansion (smallholder and large-scale or estate-driven). A biodiversity value-weighted deforestation illustration was not included in the provincial data. The risk data shows Sumatra has the highest oil palm area (with smallholders) in Riau, Jambi, South and North Sumatra, Bengkulu, and Bangka Belitung, while smallholder expansion is relatively fast in Aceh and slower in North Sumatra and Riau. For Kalimantan, the highest oil palm area (with smallholders) is in East Kalimantan and West Kalimantan; and recent rapid expansion was in West Kalimantan (mostly estate-driven) and then East and North Kalimantan (driven by both smallholders and estates). Indonesia-wide, the fastest smallholder expansion is in East Kalimantan and also North Kalimantan and South Sulawesi (from a lower base). Smallholder expansion is limited in Sumatra (e.g. Aceh). Estate expansion is faster in West Kalimantan from a mid-base and also in the southern provinces of Sumatra from a higher base.

Social issues (risks of child labour, forced labour, inadequate health and safety and land rights abuses) are summarised by province in Table E8a (and Figure E8a illustrates). Indicated alongside each province is the oil palm production area and for each region (several provinces each) the export volume to China in 2018 is stated. Likewise, the provinces are shown against environmental risk factors (oil palm landscape dominance, smallholders, and expansion) in Table E8b. Figure E8b illustrates Indonesia deforestation weighted by biodiversity value (but data metrics were not available for tabulation).

Meijaard, Brooks, Carlson, Slade, et al. (2020), Obidzinski, Andriani, Komarudin, and Andrianto. et al. (2012), and Fry, Sheane, Schreiber, Royston et al. (2018) identify several environmental risks associated with palm oil plantations. These include: (1) deforestation (the extent and attribution is contested); (2) loss of biodiversity and decline in certain animal species as oil palm is a poor replacement for natural tropical forests; (3) greenhouse gas (GHG) emissions, such as carbon dioxide, methane, and nitrous oxide, from forests clearance, peatland drainage, and palm oil production; (4) decline in water quality (fertilisers and pesticides) and quantity; (5) soil erosion due to forest clearance; and (6) air pollution from plantations and mill sites as well as forest fires.

While social issues and environmental risks can be read against production and export indicators (and also mapped against oil palm zones and palm oil facilities), the often complicated and multi-layer movement of palm products (to refinery-port hubs and processing facilities, from other refineries, and from palm kernel crushers and hundreds of mills across Indonesia), can make riskier supply bases hard to pin down against exports. The emergence of fiscal information (reporting who sells to whom locally) and bill of lading (last exporter to first importer), will start to point the way, along with traceability data (including traceable to plantation information). Ultimately, clear metrics should be available on the reduction in sourcing from recent deforestation and social risk areas; and other outcomes from altered supply-chain behaviour.

Major findings:

- The worst provinces for social risk with oil palm (high ratings) were West Papua, Papua, Central Sulawesi, Aceh and the best included Bangka Belitung, South Sumatra, Jambi and Riau. The better ones in Sumatra (the main export region) were Bangka Belitung and South Sumatra and worse were Aceh and North Sumatra. For Kalimantan (the second largest export region), the better provinces were Central and South Kalimantan and worse were East and North Kalimantan.
- Indonesia-wide environmental risks indicators point to the fastest smallholder expansion is in East Kalimantan and also North Kalimantan and South Sulawesi (from a lower base); while smallholder expansion is limited in Sumatra (ex Aceh). Estate expansion is faster in West Kalimantan from a mid-base, North and East Kalimantan, and in the southern provinces of Sumatra from a higher base.
- Summary of issues by region. Sumatra: Aceh (smallholders & high social risks), North and West Sumatra (estate expansion & moderate social risks), South Sumatra (deforestation risk), other parts of Sumatra (smallholders, estate-driven expansion & lower social risks). Kalimantan: Social risks in North, East and West Kalimantan, all with estate-driven expansion plus smallholder expansion in East Kalimantan, deforestation risks in North, East, West, and Central Kalimantan. Sulawesi & Papua: High social risks in West Papua and Central Sulawesi; and oil palm expansion from a low base, deforestation risk in Central Sulawesi.
- The often complicated and multi-layered movement of palm products can make riskier supply bases hard to pin down against exports. Ultimately, clear metrics should be available on the reduction in sourcing from recent deforestation and social risk areas; and other outcomes from altered supply-chain behaviour.

Table E8a: Key export regions and palm oil provinces rated for social and labour issues

Key Region & Ports; and palm oil producing provinces	Key indicators for palm exports and production area	Child labour (1-5 is lower risk- higher risk)	Forced labour	Inadequate health and safety	Land rights abuses	Average rating
SUMATRA						
Sumatra key ports - Batam Island, Belawan, Dumai, Kabil/Panau, Kuala Tanjung, Palembang, Panjang, Tarahan, Teluk Bayur	1.98 million tonnes of palm oil export to China 2018					
Aceh	0.33 million mature palm oil hectares	4.11	4.28	4.42	4.56	4.34
North Sumatra	1.47	3.87	3.87	4.30	4.22	4.07
West Sumatra	0.46	3.56	3.89	3.84	4.25	3.89
Riau	1.97	3.41	3.24	3.32	3.62	3.40
Jambi	0.73	3.23	3.23	3.10	3.88	3.36
South Sumatra	0.96	3.08	3.25	3.13	3.40	3.22
Bangka Belitung	0.21	3.00	3.17	3.00	3.48	3.16
Bengkulu	0.28	3.80	3.80	3.94	4.20	3.94
Lampung	0.22	3.87	3.53	3.80	3.75	3.74
JAVA						
Java's key ports - Gresik, Tanjung Emas, Tanjung Perak, Tanjung Priok	0.34 million tonnes export to China 2018					
No major production in Java, pockets in West Java & Banten.						
KALIMANTAN						

Kalimantan's key ports - Balikpapan, Kota Baru, Sampit, Tarjun	1.10 million tonnes export to China 2018					
West Kalimantan	1.28 million mature palm hectares	3.95	3.95	3.93	4.29	4.03
Central Kalimantan	1.45	3.60	3.75	3.63	3.51	3.62
South Kalimantan	0.57	3.39	3.56	3.59	3.95	3.62
East Kalimantan	0.94	3.98	4.15	3.98	4.08	4.05
North Kalimantan	0.82	4.11	4.11	4.17	4.28	4.17
SULAWESI & PAPUA						
Sulawesi's ports - Bitung, Mamuju, Pantoloan, Sv. Papua's ports - none (for palm exports to China).	0.09 million tonnes export to China 2018					
Central Sulawesi	0.15 million mature palm hectares	4.23	4.40	4.60	4.43	4.42
West Sulawesi	0.15	4.23	3.90	4.10	3.70	3.98
South Sulawesi	0.06	3.39	3.56	3.59	3.95	3.62
Papua	0.06	4.39	4.57	4.60	4.04	4.40
West Papua	0.08	4.59	4.76	4.64	4.76	4.69

Source: Authors' summary of data from Directorate General of Estate Crops (2018), Proforest (2020a, internal), Trase (2020).

Table E8b: Key export regions and palm oil provinces rated for environmental issues

Key Region & Ports; and palm oil producing provinces	Key indicators for palm exports and production area	Area converted to oil palm	Planted area controlled by SHs	OP expansion	SH OP expansion	Lge scale OP expansion
SUMATRA						
Sumatra key ports - Batam Island, Belawan, Dumai, Kabil/Panau, Kuala Tanjung, Palembang, Panjang, Tarahan, Teluk Bayur	1.98 million tonnes of palm oil export to China 2018					
Aceh	0.33 million mature palm oil hectares	≤10%	>50%	≤5.0%	≤5.0%	≤5.0%
North Sumatra	1.47	≤20%	≤30%	≤2.5%	≤2.5%	≤5.0%
West Sumatra	0.46	≤10%	≤50%	≤5.0%	≤2.5%	≤10.0%
Riau	1.97	>20%	>50%	≤2.5%	≤1.0%	≤2.5%
Jambi	0.73	≤20%	>50%	≤5.0%	≤2.5%	≤10.0%
South Sumatra	0.96	≤20%	≤50%	≤5.0%	≤2.5%	≤10.0%
Bangka Belitung	0.21	≤20%	≤30%	≤5.0%	≤2.5%	≤5.0%
Bengkulu	0.28	≤20%	>50%	≤5.0%	≤2.5%	≤10.0%
Lampung	0.22	≤10%	>50%	≤5.0%	≤2.5%	≤5.0%
JAVA						
Java's key ports - Gresik, Tanjung Emas, Tanjung Perak, Tanjung Priok	0.34 million tonnes export to China 2018					
No major production in Java, pockets in West Java & Banten.						
KALIMANTAN						

Kalimantan's key ports - Balikpapan, Kota Baru, Sampit, Tarjun	1.10 million tonnes export to China 2018					
West Kalimantan	1.28 million mature palm hectares	≤10%	≤30%	>15%	≤2.5%	>15%
Central Kalimantan	1.45	≤10%	≤20%	≤5.0%	≤5.0%	≤5.0%
South Kalimantan	0.57	≤20%	≤20%	≤5.0%	≤5.0%	≤5.0%
East Kalimantan	0.94	≤10%	≤40%	≤10.0%	>15%	≤10.0%
North Kalimantan	0.82	≤5%	≤20%	≤10.0%	≤10.0%	≤10.0%
SULAWESI & PAPUA						
Sulawesi's ports - Bitung, Mamuju, Pantoloan, Sv. Papua's ports - none (for palm exports to China).	0.09 million tonnes export to China 2018					
Central Sulawesi	0.15 million mature palm hectares	≤5%	≤50%	≤5.0%	≤10.0%	≤5.0%
West Sulawesi	0.15	≤10%	>50%	≤5.0%	≤2.5%	≤10.0%
South Sulawesi	0.06	≤5%	>50%	≤10.0%	≤15.0%	≤5.0%
Papua	0.06	≤1%	≤30%	≤10.0%	≤5.0%	≤15.0%
West Papua	0.08	≤1%	≤30%	≤10.0%	≤5.0%	≤15.0%

Source: Authors' summary of data from Directorate General of Estate Crops (2018), Proforest (2020b, internal), Trase (2020).

Figure E8a: Indonesia provinces rated for social and labour issues

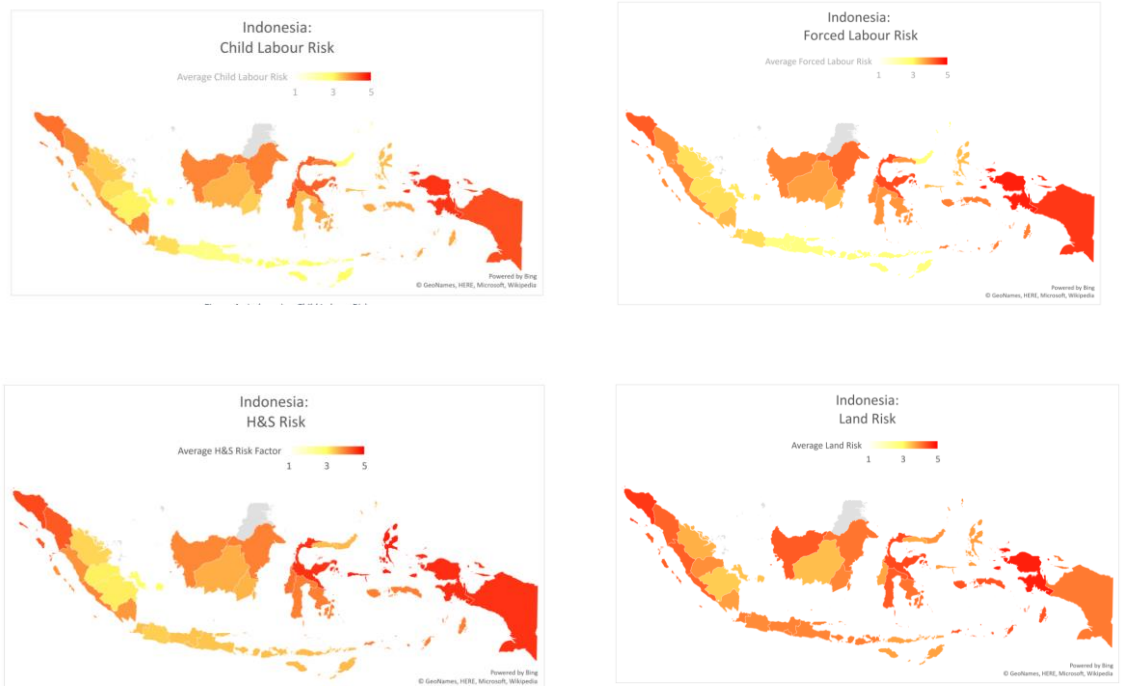
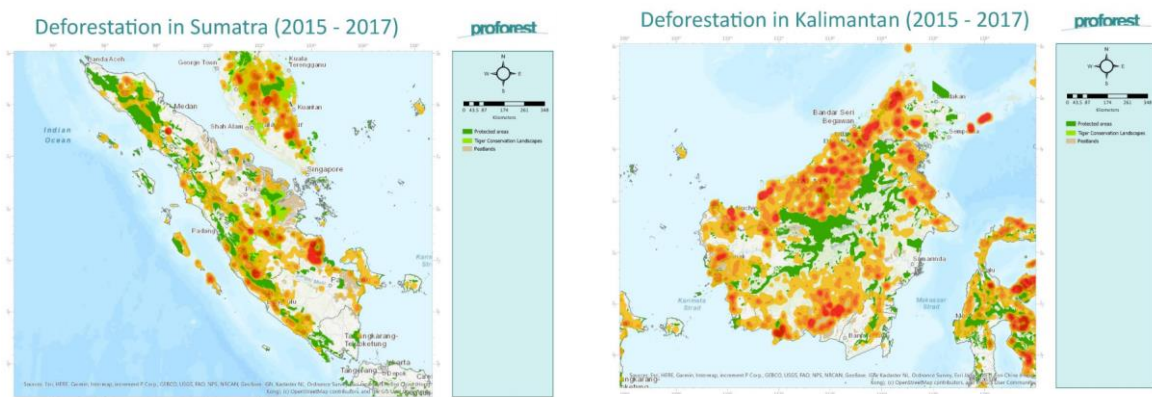


Figure 6- Indonesia - H&S Risk

Source: Proforest (2020a).

Figure E8b: Indonesia deforestation weighted for biodiversity value



E9 Trase data

Pirard, Schulz, Benedict, Heilmayr, et al. (2020) found that 187 corporate groups are operating at the plantation stage and 178 at the mill stage. Only 25 groups are operating at the refinery stage, while 55 were exporters in the supply chain. Three processor-traders - Wilmar, Sinar Mas, and Musim Mas - own more than half the palm refinery capacity and dominate exports from Indonesia.

Three quarters of refining and (global) exports are controlled by 10 main groups, i.e. Wilmar, Musim Mas, GAR-Sinar Mas, RGE-Apical-Asian Agri, Hayel Saeed Group-Pacific Interlink, Permata Hijau, Sungai Budi, Salim-Indofood-Indoagri, and Surya Dumai-First Resources. They were significant, but less engaged upstream. The 10 groups had one-fourth of total mill capacity and about 16% of the plantation area (but there are unknowns in plantation ownership). Although most of the group are vertically integrated, these large differences point to an overall limited vertical integration (in terms of self-reliance). They are large trader-processors with a dominant role in moving the large majority of products from all plantations and farms, and mills.

Further, Trase worries that the large installed mill capacity (85 million tons CPO-equivalent/year) outstrips palm oil production (41 million tonnes CPO/year). This may encourage the expansion of production (perhaps from smallholder and mid-sized players) and poses a risk to forests.

The Indonesia-China trade: Trase (2020) data (this seems to cover crude palm oil and refined products) for the Indonesia to China trade for 2018 (and 2013) is summarised in the next two tables, featuring key Indonesia origin regions (and ports), CPO-equivalent volume, the export companies (according to bill of lading data used) and also for China. The graph below explains the exporter and importer landscape by group.

Table E9a: Indonesia Key Ports and Exporters for China Palm Product Trade

Key region & ports	2018 export volume to China (tonnes)	Group (last exporter), ranked by volume
Sumatra - Belawan, Dumai, Kuala Tanjung, Manggar, Panjang, Sultan Mahmud Badaruddin (U), Tanjung Pandan, Teluk Bayur	1,980,809	Musim Mas (Intibenua Perkasatama, Musim Mas, Wira Inno Mas), Surya Dumai-First Resources (Adhitya Serayakorita), Jardine-Astra Agro (Kreasijaya Adhikarya), RGE-Apical-Asian Agri (Sari Dumai Sejati), Wilmar (Wilmar Nabati Indonesia, Multimas Nabati Asahan), GAR-Sinar Mas (Sinar Mas Agro Resources And Technology, Ivo Mas Tunggal, Binawit Abadi Pratama), Permata Hijau (Nagamas Palmoil Lestari, Permata Hijau Palm Oleo, Permata Hijau Sawit, Nubika Jaya), KL Kepong-Batu Kawan (Steelindo Wahana Perkasa), Louis Dreyfus Commodities (Ldc Indonesia), Best Industry Group (Berlian Eka Sakti Tangguh), Incasi Raya (Incasi Raya, Sumbar Andalas Kencana), Agri Tirta Lestari, Hayel Saeed Group-Pacific Interlink (Pacific Medan Industri), Sintong Abadi, Inno-Wangsa (Inno-Wangsa Oils & Fats), Sungai Budi Group (Tunas Baru Lampung)
Java - Gresik, Tanjung Perak, Tanjung Priok, Semarang, Buatan	342,948	Wings Group (Karyaindah Alam Sejahtera), GAR-Sinar Mas (Purimas Sasmita, Sinar Mas Agro Resources And Technology, Sinar Meadow International Indonesia), Best Industry Group (Berkah Emas Sumber Terang, Batara Elok Semesta Terpadu), Citra Nutrindo Langgeng, Sungai Budi Group (Tunas Baru Lampung, Budi Nabati Perkasa), Salim-Indofood-Indoagri (Salim Ivomas Pratama), Musim Mas (Megasurya Mas), Wilmar (Wilmar Nabati Indonesia), RGE-Apical-Asian Agri (Riau Andalan Pulp & Paper)

Kalimantan - Balikpapan, Sampit, Tarjun, Ciwandan, Kumai, Stagen	1,102,976	RGE-Apical-Asian Agri (Kutai Refinery Nusantara), GAR-Sinar Mas (Sinar Mas Agro Resources And Technology, Binasawit Abadi Pratama), Citra Borneo Utama (CBI Group), Louis Dreyfus Commodities (Ldc East Indonesia), Musim Mas (Sukajadi Sawit Mekar), Sime Darby Plantations (Golden Hope Nusantara), Incasi Raya (Selago Makmur Plantation)
Sulawesi - Bitung, Pantoloan	94,761	Jardine-Astra Agro (Tanjung Sarana Lestari), Musim Mas (Agro Makmur Raya), Wilmar (Multimas Nabati Sulawesi), Salim-Indofood-Indoagri (Salim Ivomas Pratama)

Data: Trase (2020). Note: 2018 is the most recent year for data from Trase, as of 20 Feb 2020. For 2018, Indonesia exported 3.5 million tonnes to China; and exports to other countries (million tonnes) included: 6.3 to India, 2.6 to Pakistan, 1.2 to Netherlands, 0.9 to Italy, 0.8 to Egypt, 1.0 to Spain, 0.4 to Singapore and 0.8 to Russia.

Table E9b: China Key Ports and Importers for China Palm Product Trade

Key region & ports	2018 export volume to China (tonnes)	Group (first importer), ranked by volume
China	3,521,494	Musim Mas (Inter-Continental Oils & Fats), Gar-Sinar Mas (Golden Agri International), Rge-Apical-Asian Agri (AAA Oils & Fats, April Far East Malaysia Sdn Bhd), Surya Dumai-First Resources (First Resources), Jardine-Astra Agro With KL Kepong (Astra - KLK), Louis Dreyfus Commodities, Permata Hijau (Virgoz Oils And Fats), Gideon Agri, Just Oil And Grain, Sime Darby Plantations (Sime Darby), Sawit Sumbermas Sarana (Borneo Agri-Resources International), Sungai Budi Group (Inter-United Enterprises), others

Data: Trase (2020). Note: 2018 is the most recent year for data from Trase, as of 20 Feb 2020; and no breakdown by key region and port was provided for China. For 2018, Indonesia exported 3.5 million tonnes to China; and exports to other countries (million tonnes) included: 6.3 to India, 2.6 to Pakistan, 1.2 to Netherlands, 0.9 to Italy, 0.8 to Egypt, 1.0 to Spain, 0.4 to Singapore and 0.8 to Russia.

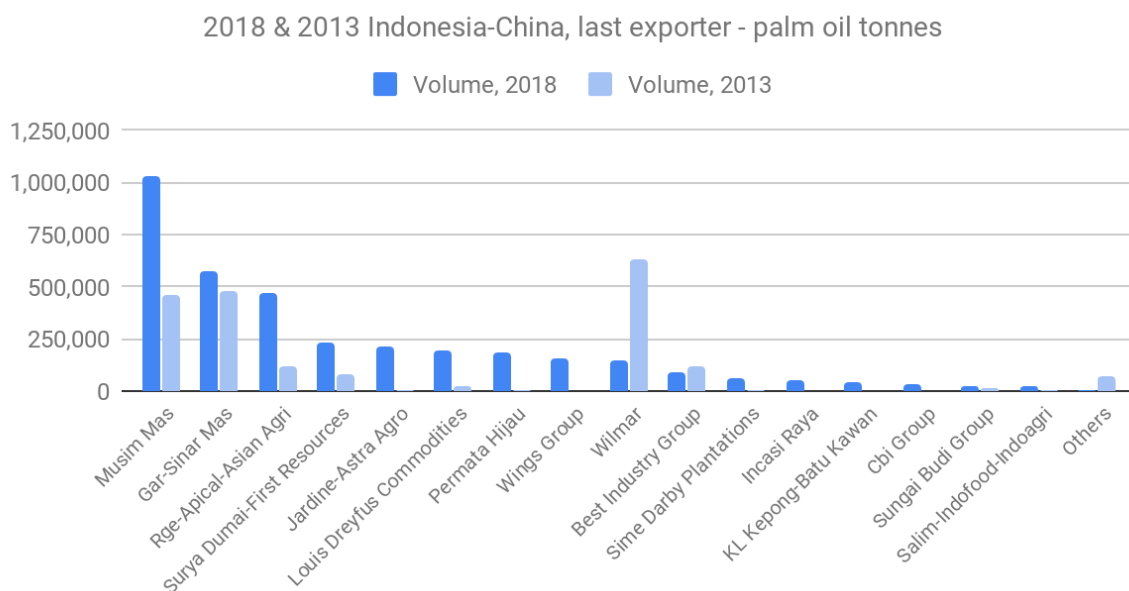
Top groups exported/imported 3.4 million tonnes or 96% of the Indonesia-China 2018 total trade; but RSPO estimates that only 1.5% was RSPO certified. Notably, the trade is about 90% (of volume) closed or internal trade (i.e., exports from origin match imports at destination within a group), for: Musim Mas, Gar-Sinar Mas, Rge-Apical-Asian Agri, Surya Dumai-First Resources, Jardine-Astra Agro with KL Kepong, Louis Dreyfus Commodities, Permata Hijau, Wilmar, Sime Darby Plantations and Sungai Budi Group. Only about 10% appears to be open trade (i.e. not within a group). Net seller to China: Wings Group (volume is similar to Gideon Agri), Best Industry Group, Incasi Raya, Cbi Group, Salim-Indofood-Indoagri. Net buyers: Gideon Agri, Just Oil and Grain, and others.

Of special note is the shift of Wilmar from being a top exporter cum importer (a closed trade, and top volume group in 2013) to a lower physical trading position; showing that it has increased the sourcing of palm material within or onshore China. Specialists were not surprised, as palm oil has been cheaper within China, thanks to shadow financing that encourages the purchase of commodities and the subsequent sale of these at below international market prices within China.

Wilmar sources much of its palm material within China. Wilmar reports on four oleochemical facilities, supplied 32% with China sourced palm oil and 42% with China sourced palm kernel and other lauric

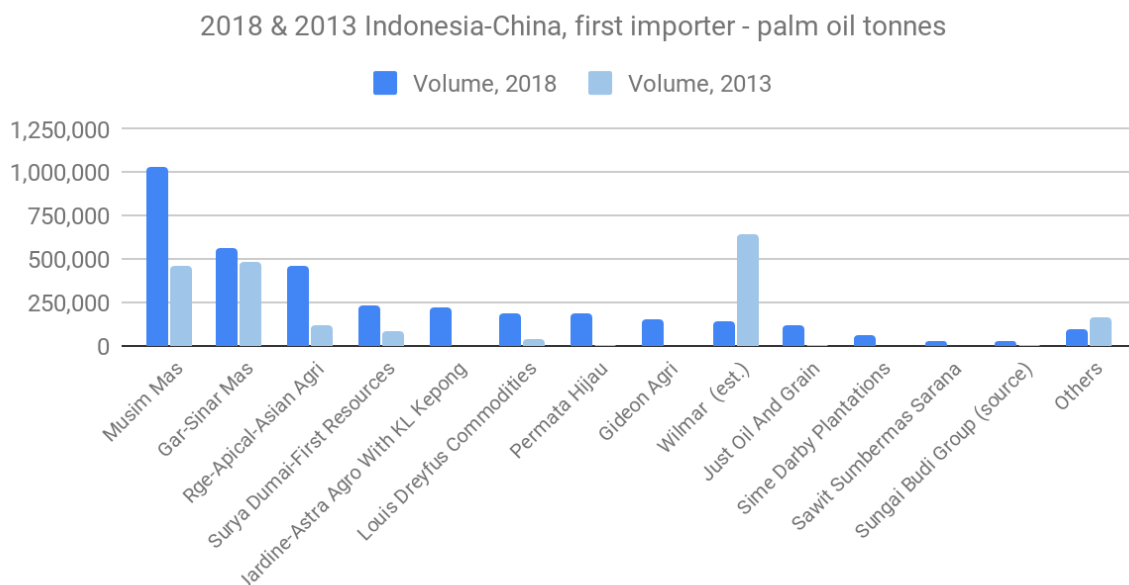
oils. For six Wilmar specialty fat facilities in China (supplying major buyers), the group reports 64% of the total volumes of palm products sourced as "local" (from China) and 36% from Indonesia and Malaysia into China in October 2018 - September 2019 (Wilmar 2020). There are supplying Wilmar Indonesia refineries (MNA, Kuala Tanjung; MNS, Bitung; WINA, Dumai; WINA, Padang) and third party refinery suppliers (Inti Benua Perkasatama (Musim Mas), Dumai; Inti Benua Perkasatama (Musim Mas), Lubuk Gaung; Inter-Continental Oils & Fats Pte Ltd (Musim Mas), Bitung; Kutai Refinery Nusantara (RGE-Apical-Asian Agri), Balikpapan; PT Kreasijaya Adhikarya (Jardine-Astra Agro), Dumai; Musim Mas, Batam; Musim Mas, Belawan; PT. Smart Tbk. (GAR-Sinar Mas), Tarjun; Sari Dumai Sejati (RGE-Apical-Asian Agri), Lubuk Gaung; PT Sukajadi Sawit Mekar (Musim Mas), Bagendang). While Wilmar provides details for 10 China processing facilities, it has many more facilities there, including refineries which its dashboard does not seem to cover⁹¹.

Figure E9a: Top Indonesia-China traders



Data: Trase (2020) and author's estimates

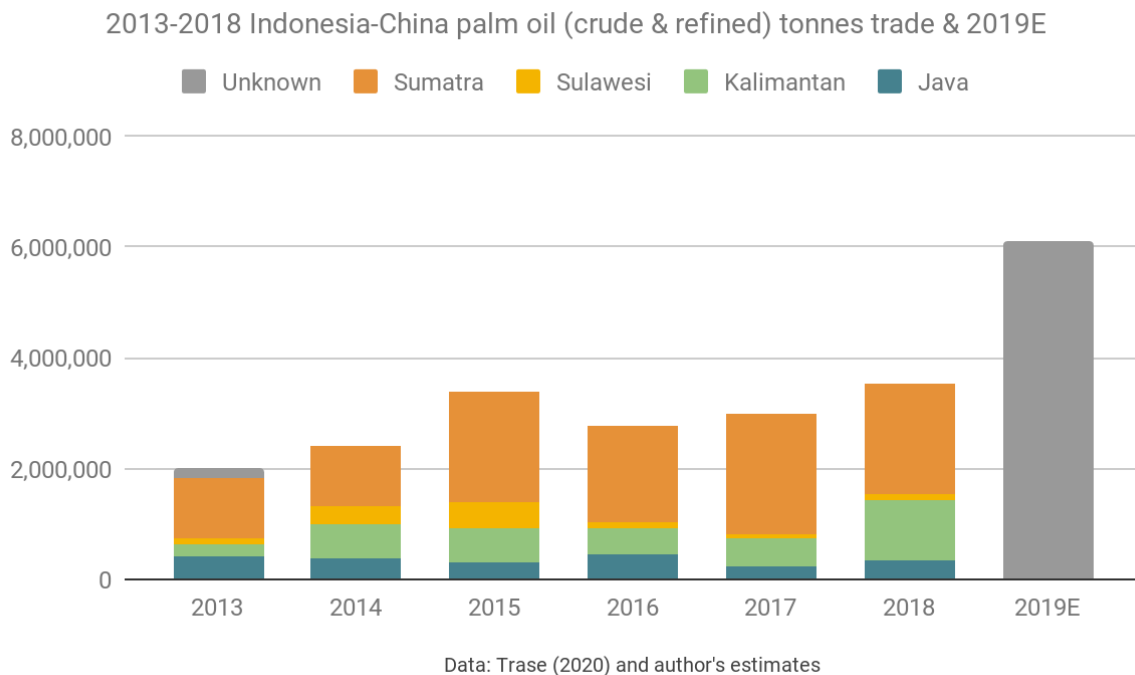
⁹¹Yihai Kerry (Wilmar China) & Wilmar International Limited. In China: 51 refineries, 10 oleochemicals, 6 specialty fats, and 0 biodiesel; and via associates: 7 refineries, 2, oleochemicals, 2 specialty fats, and 0 biodiesel. Est. 45% market share for palm-based products; including 1.5 million tonnes of cooking oil, frying oil and other; 1 million tonnes specialty fats, 0.5 million tonnes oleochemicals. USD 24.99 billion revenue in FYE2018 (palm and other products); USD 6.90 billion of non-current assets in FYE2017. Source: Indonesia-China Sustainable Palm Oil, Final Report, 18 Oct 2019 (for this study project).



Data: Trase (2020) and author's estimates

Overall, Trase reports a robust and rising palm oil trade, with volume up from about 2 million to 3.5 million tonnes per year, with a slowdown after 2015, and a pick-up in 2018. The key supplying ports are in the region of Sumatra and Kalimantan (a significant rise in 2018), while Sulawesi ports have become a minimal supplier. See Figure E9b below.

Indonesia Palm Oil Association (GAPKI) reported exports of 34.7 million tonnes in 2018, rising to 36.2 million tonnes of palm oil and its products, including biodiesel and oleochemical in 2019; and GAPKI notes that trade to India fell as Indonesia faced higher tariffs than Malaysia (Munthe and Fransiska, 2020b). About 13% of Indonesia palm oil (crude and refined) exports of 27.9 million tonnes went to China in 2018 while almost 23% went to India, but experts (estimating 6.1 million tonnes Indonesia exports) point to a reversal of their market positions in 2019, with China becoming the lead market for Indonesia (official data via UN Comtrade was not available for 2019, at the point of writing).

Figure E9b: Indonesia-China origin regions

Note: Origin region refers to the export port location. Unknown origin volume in 2013 was a shipment by Gar-Sinar Mas (which has exported from Java, Kalimantan and Sumatra). 2019 volume is estimated and not from Trase (pending official data).

Summary of findings:

- Top groups (mostly RSPO members) exported/imported 3.4 million tonnes or 96% of the 2018 volume; but only 1.5% was RSPO certified. 90% was closed /internal trade (i.e., within a group). These big traders include Musim Mas, Gar-Sinar Mas, Rge-Apical-Asian Agri, Surya Dumai-First Resources, Jardine-Astra Agro with KL Kepong, Louis Dreyfus Commodities, Permata Hijau, Wilmar, Sime Darby Plantations and Sungai Budi Group.
- Wilmar has shifted from a top exporter cum importer to increased China onshore sourcing.
- Trase reports the palm oil (crude and refined) trade from Indonesia to China rose from 2 million to 3.5 million tonnes per year, with a slowdown after 2015, and a pick-up in 2018.
- Sumatra has been the key supply region (by port origin), but Kalimantan has been strong in 2018, while Sulawesi ports have become minimal suppliers.
- But in 2019, China leapfrogged India to become Indonesia's key export market for palm oil, buying an estimated 6.1 million tonnes of palm oil.

E10 Findings and recommendations

Recap of findings

First, we recap the major findings from each of the seven segments of part 2 of the report.

Gender perspectives:

- The number of temporary workers for Wilmar and Musim Mas are considerably low (at 9.6% and 5% respectively). Temporary workers comprise more than half of the workforce at GAR-Sinar Mas and RGE-Apical-Asian Agri, with a significant majority of women workers (about 75% and 93% of women workers respectively) on temporary status. According to FAO (2019), it is the norm within the Indonesian agricultural sector that women are more likely to work as unpaid workers in the informal sector and/or engage in casual/part-time work compared to men. Broadly, data is incomplete on the number of temporary women workers and gender salary disparities.
- Gender governance is improving with the formation of women/gender equality committees at some estates. Occupational Health and Safety (OHS) committees are also largely in place to enforce safety protocols and standards.
- According to SPOTT, all four plantation companies have reported adoption of several international labour standards. The UN Declaration of Human Rights and Free, Prior and Informed Consent (FPIC) are the most consistent standards adopted. Some have also adopted additional labour standards, such as Wilmar on the ILO Conventions.
- There is a difference in ratings for policy (higher) and practice (lower) of labour standards, according to SPOTT. On crafting labour policies, ratings range 72% to 92%. But ratings for the practice of these policies ranged 52% to 61% with an exception of 85% for RGE-Apical-Asian Agri. Reading deeper, we note that the rating has a focus on data disclosure rather than the actual metrics at this point. While RGE-Apical-Asian Agri rates better on data transparency (than peers), 60% of its workers were temporary (worse than selected peers), and 93% of these were women.
- Focussing on six rating items that specifically refer to gender (on inclusion of women, addressing barriers and eliminating discrimination within operations and with all suppliers; reporting percentage women employees, and salary by gender), the simple average of the ratings put Wilmar and GAR-Sinar Mas at joint highest, followed by RGE-Apical-Asian Agri and Musim Mas (with more “no answer” items; see more in Annex 2).

China trade deals and trade issues:

- CSIS notes that Chinese investment in Indonesia agriculture has been particularly low. There is a chance that BRI could increase this. On the other hand, with many reliable suppliers of palm oil investing in their own trade infrastructure, China may see no need to invest. Trade has not been linked to investment and this situation may persist.
- Palm oil volume from Indonesia to China saw a significant rise in 2019, making China the largest palm destination ahead of India and the EU; and breaking out from range-bound volumes in recent years.
- Volume to China is likely in a major flux from 2018, to 2019 and 2020. There is the influence of swine flu (negative soy imports, positive palm oil), low palm oil price relative to mineral oil

(boosting imports for use in farm machinery and fishing vessels; but this has reversed as palm oil price surged in 2H2019 and crude oil prices have slumped in 1Q2020 with the outbreak of an OPEC or Saudi-Russia trade war), and US-China trade deal (neutral-positive palm oil if more meat is imported to China to negative palm oil if more soy is bought).

- RSPO membership is high among trader-processors for Indonesia-China trade, but they have a focus on NDPE and traceability. So, their movement of RSPO materials remains very limited and RSPO reports a 1.5% market share, up to mid-2018. Some market experts point out that NDPE will continue to usurp RSPO's market share.

Large plantations groups and business connections with China:

- The direct Indonesia-China trade was dominated by Musim Mas, Gar-Sinar Mas, and RGE-Apical-Asian Agri in 2018. Wilmar moved just under 150,000 tonnes of palm material in 2018, becoming less dominant as a direct trader (compared to 2013), and it appears to buy a large part of its palm oil supplies onshore in China (refer to E9 Trase Data).
- Market specialists report that Wilmar is still dominant in palm oil in China with about 40-50% of the market, followed by COFCO with 30-40% and others account for 20-30%.
- About third of Wilmar's 180 refineries (subsidiaries and associates) are in China. For FYE Dec 2018, USD 25 billion revenue (56% of its global revenue) and USD 7.0 billion non-current assets (36% of its global non-current assets) were from China. Its website reports over 300 manufacturing plants in more than 60 China locations; making it the largest edible oils refiner and specialty fats and oleochemicals manufacturer, the leading oilseed crusher, producer of branded consumer pack oils, rice and flour, and one of the largest flour and rice millers. Recently, CGS-CIMB (2020) reports Wilmar on track to list YKA in China and its operations in China have so far not been significantly affected by the Covid-19 outbreak.
- Musim Mas has three out of 17 of its refineries in China and reports USD 7.5 million of revenue in 2018 were from China and.
- GAR-Sinar Mas reports two refineries (out of six) in China, after having sold its Tianjin refinery to Louis Dreyfus in 2017 (Reuters, 2017). For FYE Dec 2018, USD 853 million revenue (13% of its global revenue) and USD 107 million non-current non-financial assets (2.4% of its global non-current non-financial assets) were from China. It has 20 subsidiaries in China.
- RGE-Apical-Asian Agri has one of its five refineries in China.

Indirect investment, and Chinese capital flow to the Indonesian palm oil industry

- China FI funding of palm oil appears limited, in general (USD 2.7 billion; 4.6% of total financing for all commodities, for all groups in the dataset) and for the selected groups (USD 2.3 billion or 10.5% for palm oil).
- China FIs notably fund the pulp and paper activities of GAR-Sinar Mas and RGE-Apical-Asian Agri in China.
- GAR-Sinar Mas received the most financing overall (USD 16 billion), followed by RGE-Apical-Asian Agri (USD 7.6 billion) and Wilmar (USD 5.5 billion), from all financiers.
- China FI funding went to GAR-Sinar Mas (USD 6.7 billion), and RGE-Apical-Asian Agri (USD 3.5 billion). There was significant funding for COFCO (USD 1.5 billion), ZTE and Tianjin Julong.

- Among the top five key plantation groups, GAR-Sinar Mas and RGE-Apical-Asian Agri received financing for the palm oil and pulp & paper commodities sectors; and financing for Wilmar, COFCO, and Jardine-Astra Agro was only for palm oil.
- Financing from China FIs make up a significantly large portion of the total financing received by COFCO (79%), GAR-Sinar Mas (42%), RGE-Apical-Asian Agri (46%). Only 4.0% of Jardine-Astra Agro's financing came from China; for Wilmar, the figure is 3.3%. See information by palm oil group (Annex 3).

RSPO premia and its drivers:

- Sustainability certified products are not free, and they attract premia, as suppliers seek to cover their costs or more. The key certifications are RSPO (for food and oleochemicals) and ISCC (energy end uses, notably transport fuel). The options for RSPO certificate buyers are book & claim (B&C, also referred as credits), mass balance (MB), identity preserved or segregated (IP/SG).
- RSPO premia are more on a supply or cost-push basis, than on a demand-pull basis. Europe pays the same as Japan and India. If it is a high premia product, they all pay the same.
- Some buyers are more willing to pay more for better suppliers and quality specifications.
- RSPO premia differences (at origin) are by company name, on a case by case basis. If you are RSPO and you are blacklisted, it's no use. Some RSPO members have a difficult time on issues (including those with a presence in Papua) and are accused of greenwashing.
- Non-RSPO TTP strategies are apparent. Some European buyers are more price sensitive. Big trader-processors may offer these buyers traceability instead of RSPO SG products. Sustainable "trace to plantation" or TTP undermine RSPO SG and the RSPO in general.

Environmental & social risks from export regions:

- The worst provinces for social risk with oil palm (high ratings) were West Papua, Papua, Central Sulawesi, Aceh and the best included Bangka Belitung, South Sumatra, Jambi and Riau. The better ones in Sumatra (the main export region) were Bangka Belitung and South Sumatra and worse were Aceh and North Sumatra. For Kalimantan (the second largest export region), the better provinces were Central and South Kalimantan and worse were East and North Kalimantan.
- Indonesia-wide environmental risks indicators point to the fastest smallholder expansion is in East Kalimantan and also North Kalimantan and South Sulawesi (from a lower base); while smallholder expansion is limited in Sumatra (ex Aceh). Estate expansion is faster in West Kalimantan from a mid-base, North and East Kalimantan, and in the southern provinces of Sumatra from a higher base.
- Summary of issues by region. Sumatra: Aceh (smallholders & high social risks), North and West Sumatra (estate expansion & moderate social risks), other parts of Sumatra (smallholders, estate-driven expansion & lower social risks). Kalimantan: Social risks in North, East and West Kalimantan, all with estate-driven expansion plus smallholder expansion in East Kalimantan. Sulawesi & Papua: High social risks in West Papua and Central Sulawesi; and oil palm expansion from a low base.

- The often complicated and multi-layered movement of palm products can make riskier supply bases hard to pin down against exports. Ultimately, clear metrics should be available on the reduction in sourcing from recent deforestation and social risk areas; and other outcomes from altered supply-chain behaviour.

Trase data:

- Top groups (mostly RSPO members) exported/imported 3.4 million tonnes or 96% of the 2018 volume; but only 1.5% was RSPO certified. 90% was closed /internal trade (i.e., within a group). These big traders include Musim Mas, Gar-Sinar Mas, Rge-Apical-Asian Agri, Surya Dumai-First Resources, Jardine-Astra Agro with KL Kepong, Louis Dreyfus Commodities, Permata Hijau, Wilmar, Sime Darby Plantations and Sungai Budi Group.
- Wilmar has shifted from a top exporter cum importer to increased China onshore sourcing.
- Trase reports the palm oil (crude and refined) trade from Indonesia to China rose from 2 million to 3.5 million tonnes per year, with a slowdown after 2015, and a pick-up in 2018.
- Sumatra has been the key supply region (by port origin), but Kalimantan has been strong in 2018, while Sulawesi ports have become minimal suppliers.
- But in 2019, China leapfrogged India to become Indonesia's key export market for palm oil, buying an estimated 6.1 million tonnes of palm oil.

Recommendations

What are the next steps for these report findings? We look into three ideas below. But first, we cover the question of whether palm sustainability can be part of trade deals. To look into this, a G2G level question, we spoke to two senior Indonesia palm oil and trade specialists. In short, they said “no.”

- Expert #1. (i) No buyer demand. Unfortunately for sustainable palm oil, they are not demanding certified material in China. RSPO has an office there; and WWF tries to convince Chinese buyers to make that requirement. But there is no real demand; (ii) A trade deal? We have a China-ASEAN trade deal and we do not expect there to be an Indonesia-China deal. There, we put a limit on the tariff on palm oil products. ISPO was not part of it, as it was established after the trade deal. There was no ASEAN sustainable products chapter. I do not see an avenue for sustainable palm oil in a formal trade deal; (iii) India’s deal for Indonesia sustainable palm oil. That is Solidaridad working with the Ministry of Coordination Economic Affairs and the Solvent Extractors Association of India for a voluntary scheme, and it is not formal. They signed a MOU on this, and Solidaridad works on other commodities in Indonesia. The India deal is on palm oil and we have not heard the latest status of this project, nor have we heard of anything similar for China. Perhaps Solidaridad doesn't have an office in China? The India effort was initiated by Solidaridad; and (iv) China’s BRI approach is interesting. In relation to this, they promised to buy half a million tonnes more of palm oil, and this was followed by a bumper year for our exports to China.
- Expert #2. (i) ISPO was originally designed to meet consumer demand, just like the RSPO. ISPO is not a national standard, but a Ministry of Agriculture standard that has come to include official regulations; (ii) For international trade matters, it is about WTO and GATT compliance. None of the palm sustainability schemes (RSPO, ISPO or MSPO) are compliant with formal international trade rules. They are merely designed as consumer standards, so they are not relevant for bilateral or multilateral trade deals; (iii) There are few concerns about China trade issues on palm oil; and over in India, we see that they are playing a tariff game; and (iv) Due to the coronavirus, Indonesia is not buying products from China, including no packaged food; and since January 2020, no China flights and ships are allowed in. So, there could be uncertainty about the bilateral relationship.

In light of pessimism from experts about any formal deal on palm oil sustainability with China, it seems to be the status quo between RSPO and ISPO; and we remain in the realm of voluntary initiatives. We frame three selected issues and recommendations as follows:

#1 Plantation integrated trader-processors control the palm oil trade from Indonesia to China, and the China market is dominated by Wilmar and COFCO. They are all RSPO members and suppliers, but RSPO’s market share is at 1.5%.

Recommendations: (i) Engage with big traders Musim Mas, Gar-Sinar Mas, Rge-Apical-Asian Agri, Surya Dumai-First Resources, Jardine-Astra Agro with KL Kepong, Louis Dreyfus Commodities, Permata Hijau, Wilmar, Sime Darby Plantations and Sungai Budi Group; (ii) Seek better commitments or clarity from the key players on how to target the increase of RSPO volume from the current 1.5% market share to 5% on to 10% (and/or determine traceability’s market share and how it undercuts the RSPO); (iii) This may require better information and time bound plans, e.g., About third of Wilmar’s 180 refineries (subsidiaries and associates) are in

China but it only reports on traceability for 10 processing units. Permata Hijau Group's RSPO volume reporting is incomplete, it reports 0% CSPO sales for China and its time bound plan for Supply Chain Certification or SCC is 2014-2025⁹²; and (iv) Look into big end users, e.g., instant noodle and snack food makers, home and personal care product makers (China refers to these as daily chemicals), and fast food chain restaurants.

#2 The drivers of China's palm volume are several⁹³ and volume appears in flux. 2019 was a banner year for palm into China, and with an estimated 6.1 million tonnes of imports, it leapfrogged to become Indonesia's biggest buyer. China had promised to buy an extra half million tonnes of palm oil, and this appears fulfilled, but volume may not hold up for various reasons including palm oil being too pricey for use in biofuel and traders report soybean and soybean oil gaining share on palm oil in recent weeks (China, India seen as favouring US farm interests). From a BRI perspective, Indonesia is favoured within ASEAN with a special G2G relationship (but coronavirus reactions may dampen this). China FIs are not large funders of palm oil, nor is China FDI particularly interested in investing in palm oil and other agriculture, while infrastructure is of interest.

Recommendations: (i) As it seems hard to focus on switching export trade drivers, and trade deals are not anticipated, engagement with stakeholders may have to focus on Chinese consumers. (ii) But there is a lack of knowledge of palm oil among them. They may be more concerned about high food grade and food safety. A focus on this should naturally favour RSPO segregated material, but this has to be balanced against market preference for non-RSPO TTP or TTP and RSPO credits.

#3 Gender perspectives (better policy and practice ratings, key metrics and estate-level governance), social and environmental issues need to be even better quantified and linked to trade and supply-chain data in a systematic way.

Recommendations: (i) Review the new "trace to mill" data in Trase and other supply-chain data endeavours; (ii) Consider how outcomes of changed supply-chain behaviour can be quantified, perhaps in reference to supply data examples for Brazil beef and other case studies; and (iii) Select key metrics to track and target in more detail, to move to the next stage (beyond the current 'do you have disclosure' ratings approaches).

⁹²In its RSPO ACOP 2019: (i) 2.2.5 Total volume of all palm oil and oil palm products used in the year (tonnes) N/A and 2.4.4 Total volume (tonnes) N/A; (ii) 2.5 What is the percentage of Certified Sustainable Palm Oil in the total palm oil products sold by your company in the following regions: 2.5.7 China 0%; and (iii) 3.1 Year of first supply chain certification (planned or achieved). 2014 and 3.3 Year expected to achieve 100% RSPO certification of all palm product processing facilities. 2025.

⁹³End use has been dampened by soybean imports (down due to swine flu, but perhaps due an upswing from the US-China trade deal) and a reduction in instant noodle consumption as China goes middle income. But palm oil use can balloon when it is cheap relative to mineral oil, and we estimate nearly half the increase in palm imports into China in the last two years has been for this purpose, and this can fade away if palm oil remains more expensive than mineral oil (as it has been since 2H2019).

References

- Amnesty International. *The Great Palm Oil Scandal: Labour Abuses Behind Big Brand Names*. London: Amnesty International, 2016.
<https://www.amnesty.org/download/Documents/ASA2151842016ENGLISH.PDF>.
- Asian Agri. *Sustainability Report 2017-2018: Growing Sustainability Together with Smallholders*. Jakarta: Asian Agri, 2019.
<https://www.asianagri.com/images/pdf/2019/Asian%20Agri%20Sustainability%20Report%202017-2018.pdf>.
- Bissonnette, Jean-François. "Development through Large-Scale Oil Palm Agribusiness Schemes: Representations of Possibilities and the Experience of Limits in West Kalimantan." *Sojourn: Journal of Social Issues in Southeast Asia* 28, no. 3 (2013): 485-511. <https://www.jstor.org/stable/43186978>.
- Bray, Chad and Finbarr Bermingham. "US-China phase one trade deal likely to give state-owned companies more sway over Chinese economy, report says." *South China Morning Post*, Mar 3, 2020. <https://www.scmp.com/business/china-business/article/3064784/us-china-phase-one-trade-deal-likely-give-state-owned>.
- CGS-CIMB. *Wilmar International, Company notes - Why we are more positive post briefing*. Singapore: CGS-CIMB, Feb 24, 2020. <https://rfs.cgs-cimb.com/api/download?file=BDC0385A-5D98-4545-826A-5BB50C6C0D79>.
- COFCO International. "Contact us: Get in Touch." Accessed Jan 15, 2020.
<https://www.cofcointernational.com/contact-us/>.
- Elmhirst, Rebecca, Mia Siscawati, Bimbika Sijapati Basnett, and Dian Ekowati. "Gender and Generation in Engagements with Oil Palm in East Kalimantan, Indonesia: Insights from Feminist Political Ecology." *The Journal of Peasant Studies* 44, no. 6 (2017): 1135-1157.
<https://doi.org/10.1080/03066150.2017.1337002>.
- Fry, James, Richard Sheane, Will Schreiber, Sam Royston, Julian McGill, Mark Barthel, Steve Jennings, and Khor Yu-Leng. *Study on the environmental impact of palm oil consumption and on existing sustainability standards*. Luxembourg: Publications Office of the European Union, 2018.
<https://doi.org/10.2779/530244>.
- Golden Agri-Resources. *Sustainability Report 2018 - Seeds of Growth: Nurturing the future of sustainability*. Singapore: Golden Agri-Resources, 2019. https://goldenagri.com.sg/wp-content/uploads/2019/06/GAR_SR_2018.pdf.
- Indonesia. Secretariate of Directorate General of Estate Crops. *Tree Crop Estate Statistics of Indonesia 2017-2019: Palm Oil*. Jakarta: Directorate General of Estate Crops, Ministry of Agriculture, 2018.
<https://drive.google.com/file/d/1rlmMNUbPM99DA-Ywo-Prv3cmPnWoFUUp/view>.
- International Labour Organization, Organisation for Economic Co-operation and Development, International Organization for Migration, and United Nations Children's Fund. "Ending Child Labour, Forced Labour and Human Trafficking in Global Supply Chains." 2019.
https://www.ilo.org/ipecc/Informationresources/WCMS_716930/lang--en/index.htm.
- Kinly, David. "The Palm Oil Industry and Human Rights: A Case Study of Palm Oil Corporations in Central Kalimantan." Research paper, The University of Sydney Law School, 2015.
<http://ssrn.com/abstract=2596422>.

Li, Tania Murray. "Evidence-based Options for Advancing Social Equity in Indonesian Palm Oil." *CIFOR Infobrief*, no. 2018: 1-8. <http://dx.doi.org/10.17528/cifor/006842>.

Meijaard, Erik, Thomas Brooks, Kimberly M. Carlson, Eleanor M. Slade, John Garcia Ulloa, David L.A. Gaveau, Janice Lee, Truly Santika, Diego Juffe-Bignoli, Matthew J. Struebig, et al. "The environmental impacts of palm oil in context". *Awaiting publication in a peer-reviewed academic journal* (2020). <https://doi.org/10.31223/osf.io/e69bz>.

Munthe, Bernadette Christina and Fransiska Nangoy. "Indonesia' palm oil exports hit record in 2019." *Reuters*, Feb 3, 2020a. <https://in.reuters.com/article/indonesia-palmoil/indonesia-palm-oil-exports-hit-record-in-2019-idINKBN1ZX0YX>.

Munthe, Bernadette Christina and Fransiska Nangoy. "Indonesia's palm oil exports to China decline due to coronavirus." *Reuters*, Feb 17, 2020b. <https://www.reuters.com/article/indonesia-palmoil-china/indonesias-palm-oil-exports-to-china-decline-due-to-coronavirus-idUSL4N2AH2QO>.

Musim Mas. *Making our mark: Sustainability Report 2018*. Singapore: Musim Mas, 2019. <https://www.musimmas.co.id/qws/slot/u50127/9.%20Area%20Download/Sustainability%20Report/2018/Musim%20Mas%20Sustainability%20Report%202018.pdf>.

Obidzinski, Krystof, Rubeta Andriani, Heru Komarudin, and Agus Andrianto. "Environmental and Social Impacts of Oil Palm Plantations and their Implications for Biofuel Production in Indonesia." *Ecology and Society* 17, no. 1 (2012): 25-43. <https://www.jstor.org/stable/26269006>.

Pirard, Romain, Nils Schulz, Jason Benedict, Robert Heilmayr, Ramada Febrian, Ben Ayre, Helen Bellfield. *Infobrief: Corporate ownership and dominance of Indonesia's palm oil supply chains*. Trase, 2020. <http://resources.trase.earth/documents/infobriefs/infobrief09EN.pdf>.

Proforest. *Assessment of Labour and Land Rights Risk in Indonesian Palm Oil: Putting Findings into Context*. Proforest, 2020a. [Internal reference]

Proforest. *Selection of landscapes for engagement in Indonesia*. Proforest, 2020b. [Internal reference]

RSPO. "Search Members." Accessed March 30, 2020. <https://rspo.org/members/all>.

RSPO. "Certified Companies (Supply Chain)." Accessed March 30, 2020. <https://rspo.org/certification/search-for-supply-chain-certificate-holders>.

Sapiie, Marguerite Afra. "China agrees to increase palm oil imports from Indonesia." *The Jakarta Post*, May 7, 2018. <https://www.thejakartapost.com/news/2018/05/07/china-agrees-to-increase-palm-oil-imports-from-indonesia.html>.

SPOTT. "Palm oil: ESG policy transparency assessments." Accessed Mar 9, 2020. <https://www.spott.org/palm-oil/>.

Trompiz, Gus. "Louis Dreyfus to buy Chinese oilseed firm from Golden Agri." *Reuters*, Nov 28, 2017. <https://www.reuters.com/article/us-louisdreyfus-golden-agri-china/louis-dreyfus-to-buy-chinese-oilseed-firm-from-golden-agri-idUSKBN1DR2F4>.

Tarahita, Dikanaya and Muhammad Zulfikar Rakhmat. "How Can Indonesia Manage Its Concerns About BRI Investments?" *The Diplomat*, May 9, 2019. <https://thediplomat.com/2019/05/how-can-indonesia-manage-its-concerns-about-bri-investments/>.

Trase. *Indonesia - Palm Oil, 2013-2018* (Trase, 2020).

UNDP China. *Mapping the Palm Oil Value Chain*. Beijing: United Nations Development Programme, 2020.

https://www.cn.undp.org/content/dam/china/docs/Publications/Palm%20Oil%20Value%20Chain_EN_final.pdf.

Wilmar International Limited. *Driving Transformation: Sustainability Report 2018*. Singapore: Wilmar International Limited, 2019.

https://ir-media.wilmar-international.com/app/uploads/2019/08/wilmar_sustainability_report_2018.pdf.

Wilmar International. "Traceability - Supply Chain Map." Accessed March 5, 2020.

<https://www.wilmar-international.com/sustainability/traceability/supply-chain-map>.

Interviews

Anonymous (China-Indonesia trade advisor, Jakarta), telephone conversation with Yu-Leng Khor, Jakarta, February 25, 2020a.

Anonymous (China-Indonesia specialist at think tank, Jakarta), telephone conversation with Yu-Leng Khor, Jakarta, March 1, 2020b.

Anonymous (palm oil supply chain specialist, Jakarta), telephone conversation with Yu-Leng Khor, Jakarta, February 25, 2020c.

Anonymous (palm oil supply chain specialist, Singapore, China), telephone conversation with Yu-Leng Khor, Singapore, March 1, 2020d.

Anonymous (sustainable palm oil supplier, Malaysia, Indonesia), telephone conversation with Yu-Leng Khor, Kuala Lumpur, February 20, 2020e.

Anonymous (sustainable palm oil supplier, Singapore, Indonesia), telephone conversation with Yu-Leng Khor, Singapore, February 20, 2020f.

Anonymous (sustainable palm oil supplier, Malaysia, Singapore), telephone conversation with Yu-Leng Khor, Singapore, March 2, 2020g.

Anonymous (sustainable palm oil supplier, Malaysia), telephone conversation with Yu-Leng Khor, Kuala Lumpur, March 4, 2020h.

Anonymous (trade expert, Jakarta), telephone conversation with Yu-Leng Khor, Jakarta, February 25, 2020i.

Anonymous (trade expert, Jakarta), telephone conversation with Yu-Leng Khor, Jakarta, March 5, 2020j.

China Chamber of Commerce of I/E of Foodstuffs, Native Produce and Animal By-products (CFNA), email interview with WWF China, Beijing, June 8, 2020.

Annex 1 - Clarification items

Inclusion of note on number of RSPO complaints cases closed

RSPO complaints reports show that social issues (labour, human rights, FPIC) form 61% of RSPO complaints and environmental issues (high conservation value) form 20% of complaints. Complaints peaked in 2013 and 2017, with the majority of all complaints originating from Indonesia (57%). As of 30 June 2018, a total of 64 complaint cases have been closed between 2009 and June 2018.

Annex 2 - SPOTT rating on gender

SPOTT (2019) rates and ranks companies on sustainability policy and efforts. For Oct 2019, the SPOTT ratings reviewed for this report are based on company information disclosure rather than the metric itself, i.e. whether a company's indicator measures higher or lower than its peers. For instance, RGE-Apical-Asian Agri has a full rating as it reports on the number of temporary workers and more (better on a data transparency basis than selected peers); but 60% of its workers were temporary (worse than selected peers), and 92.9% of these were women. For six rating items that specifically refer to gender (yellow shaded, on inclusion of women and addressing barriers, eliminating discrimination within operations and with all suppliers; reporting the percentage of women employees, and salary by gender), the simple average of the ratings put Wilmar International and GAR-Sinar Mas at joint highest, followed by RGE-Apical-Asian Agri and Musim Mas (with more "no answer" red shaded boxes).

Figure A2a: SPOTT rating (community, land, & labour rights) for selected plantation groups, Oct 2019

SPOTT rating		Wilmar	GAR-Sinar Mas	RGE-Apical-Asian Agri	Musim Mas	(Max points)
1	Commitment to human rights	1.00	1.00	1.00	1.00	1.00
2	Commitment to human rights applies to all suppliers	1.00	1.00	1.00	1.00	1.00
3	Progress on human rights commitment	1.05	1.37	1.86	1.10	2.00
4	Commitment to support the inclusion of women across palm oil operations, including addressing barriers faced	1.00	0.50	0.50	0.00	1.00
5	Commitment to support the inclusion of women across palm oil operations, including addressing barriers faced, applies to all suppliers	1.00	0.50	0.00	0.00	1.00
6	Commitment to respect all workers' rights	1.00	1.00	1.00	1.00	1.00
7	Commitment to respect all workers' rights applies to all suppliers	1.00	1.00	1.00	1.00	1.00
8	Progress on commitment to respect all workers' rights	1.05	1.37	1.86	1.10	2.00
9	Commitment to Fundamental ILO Conventions or Free and Fair Labour Principles	1.00	0.50	0.50	1.00	1.00
10	Commitment to Fundamental ILO Conventions or Free and Fair Labour Principles applies to all suppliers	1.00	0.50	0.50	1.00	1.00

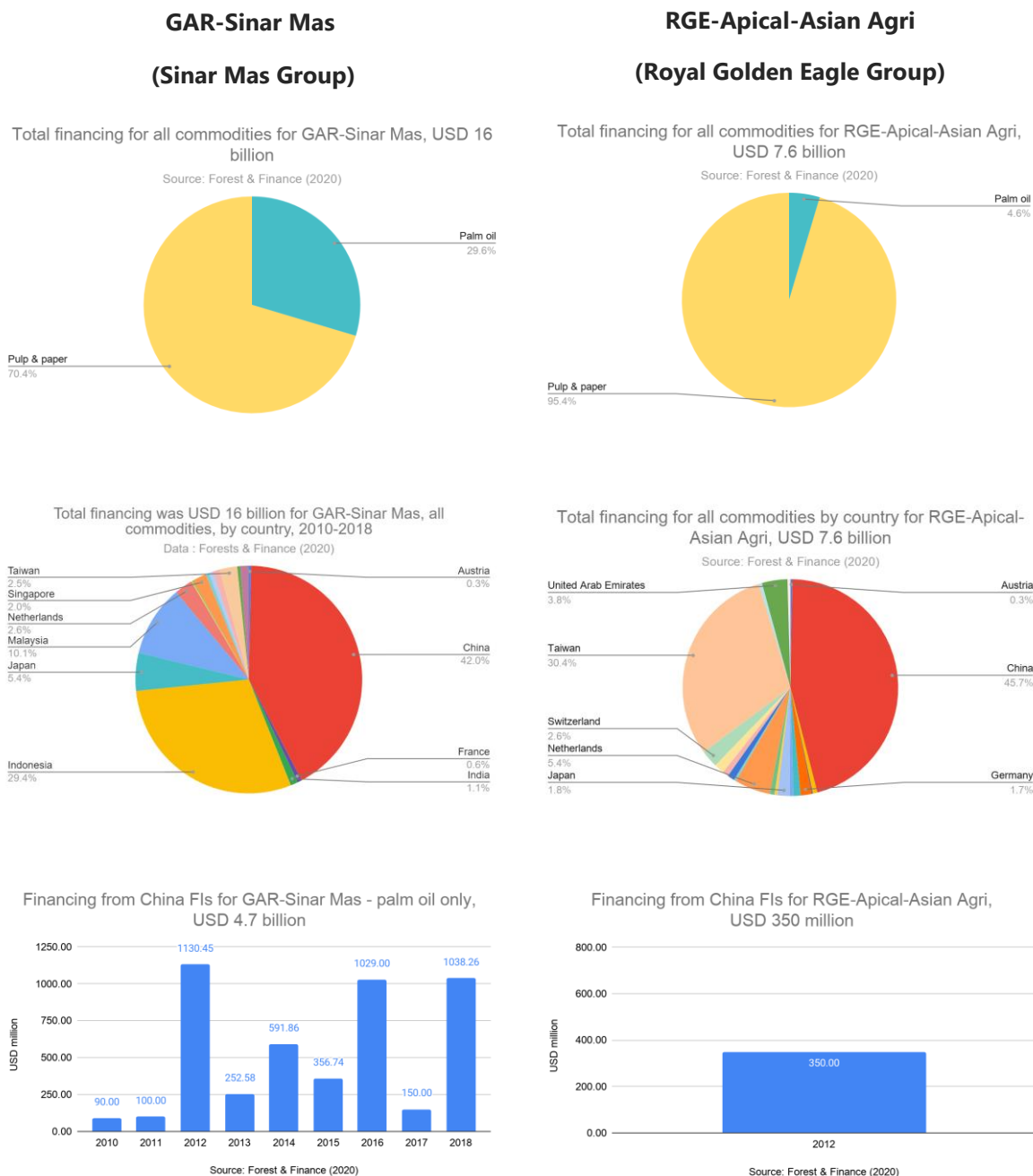
Indonesia-China Sustainable Palm Oil

11	Commitment to eliminate gender-related discrimination with regards to employment and occupation	1.00	1.00	1.00	0.00	1.00
12	Commitment to eliminate gender-related discrimination with regards to employment and occupation applies to all suppliers	1.00	1.00	1.00	0.00	1.00
13	Percentage or number of temporary employees	1.00	1.00	1.00	1.00	1.00
14	Percentage or number of women employees	1.00	1.00	1.00	1.00	1.00
15	Commitment to pay at least minimum wage	1.00	1.00	1.00	1.00	1.00
16	Commitment to pay at least minimum wage applies to all suppliers	1.00	1.00	0.00	0.00	1.00
17	Progress on commitment to pay minimum wage	1.05	1.37	1.86	1.10	2.00
18	Reporting of salary by gender	0.00	1.00	0.00	0.00	1.00
19	Commitment to address occupational health and safety	1.00	1.00	1.00	1.00	1.00
20	Commitment to address occupational health and safety applies to all suppliers	1.00	1.00	1.00	1.00	1.00
21	Reduction of time lost due to work-based injuries	0.50	0.75	0.75	0.75	1.00
22	Time lost due to work-based injuries	0.50	1.00	1.00	1.00	1.00
23	Zero fatalities as a result of work-based accidents	0.00	0.00	1.00	0.00	1.00
24	Number of fatalities as a result of work-based accidents	1.00	1.00	1.00	1.00	1.00
25	Provision of personal protective equipment and related training	1.05	1.37	1.86	1.10	2.00
For 6 selected items (yellow shaded)		0.83	0.83	0.58	0.17	
Note: Green = Yes or full answer, blue = partial answer, red = no answer				Yes	Partial	No

Data: "Palm oil: ESG policy transparency assessments, October 2019" by SPOTT. Accessed, 2 Feb 2020.

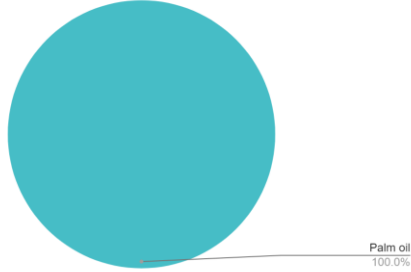
Annex 3 - China funding for selected plantations

Figure A3a: China financial institution funding for the top five plantation groups, 2011-2019



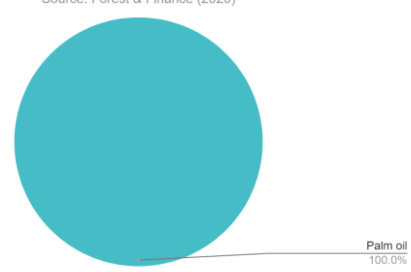
COFCO

Total financing for all commodities for COFCO, USD 1.9 billion
Source: Forest & Finance (2020)

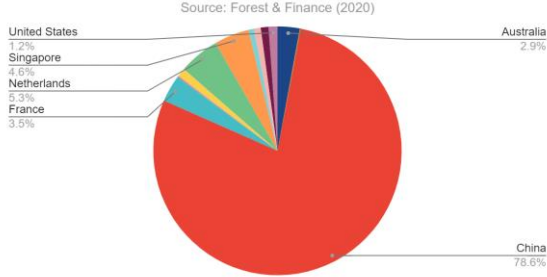


Wilmar (Wilmar Group)

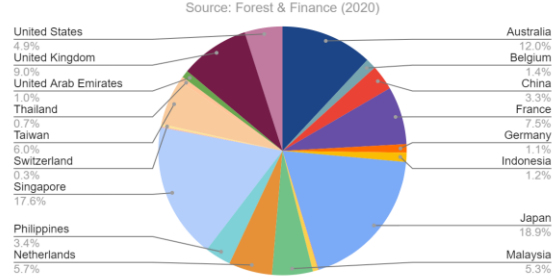
Total financing for all commodities for Wilmar, USD 5.5 billion.
Source: Forest & Finance (2020)



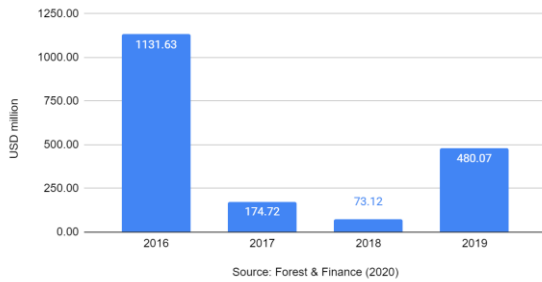
Total financing for all commodities by country for COFCO, USD 1.9 billion
Source: Forest & Finance (2020)



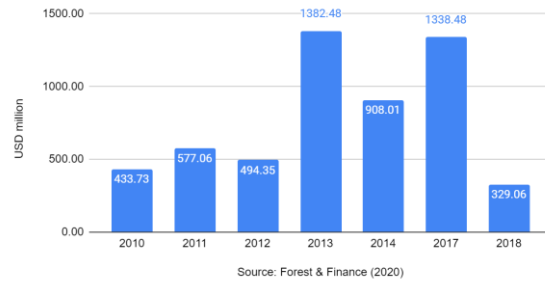
Total financing for all commodities by country for Wilmar, USD 5.5 billion
Source: Forest & Finance (2020)



Financing from China FIs for COFCO - palm oil only, USD 1.9 billion
Source: Forest & Finance (2020)



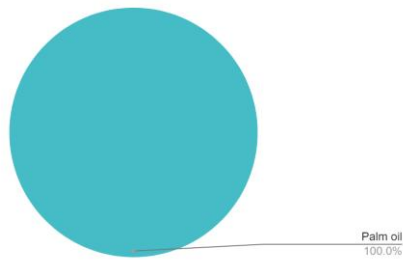
Financing from China FIs for Wilmar - palm oil only, USD 5.5 billion
Source: Forest & Finance (2020)



Jardine-Astra Agro (Jardine Matheson Group)

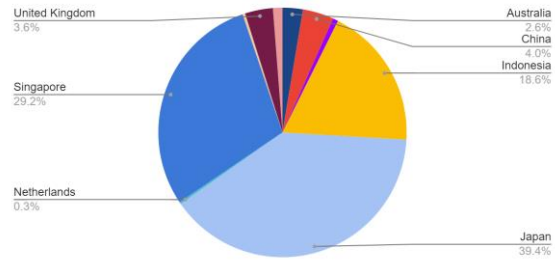
Total financing for all commodities for Jardine-Astra Agro, USD 2.4 billion

Source: Forest & Finance (2020)

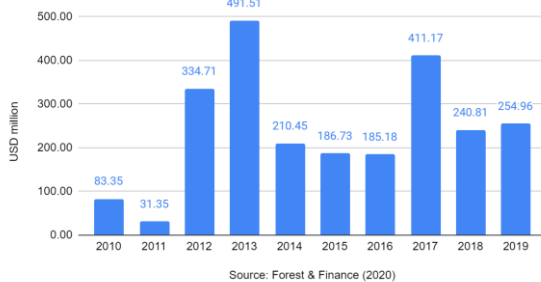


Total financing for all commodities by country for Jardine-Astra Agro, USD 2.4 billion

Source: Forest & Finance (2020)



Financing from China FIs for Jardine-Astra Agro - palm oil only, USD 2.4 billion



Note: (1) Data is for Jan 2011 to Aug 2019; (2) Sector specification is the tropical forest-risk sector production and primary processing activities, but this seems uncertain as it may be tagged to sub-groups that have more than palm oil or other commodity activities; (3) There was no financing data for Indonesia entities of COFCO International (which has Jakarta and Lampung offices), Tianjin Julong, and ZTE; and (4) Wilmar data seems incomplete with possible limited coverage of its China business by this dataset, compared to GAR-Sinar Mas.



Proforest’s Production Landscape Programme is funded by UK aid from the UK government, via the Forest Governance, Markets and Climate Programme.