

FUTURE READY

Sustainability
Report
2021





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As one of the largest players in the palm oil industry, we believe that the best strategy to ensure our continued success is to be the leading sustainable and responsible company.

Vision

To be the world's preferred supply chain partner for vegetable oils and derivatives.

Mission

Driven by a passion for excellence and commitment to continuous improvement, we strive to be the leader in the palm oil industry, producing all our palm products in an economically viable, socially responsible and environmentally appropriate manner, in full compliance with all relevant legal requirements.



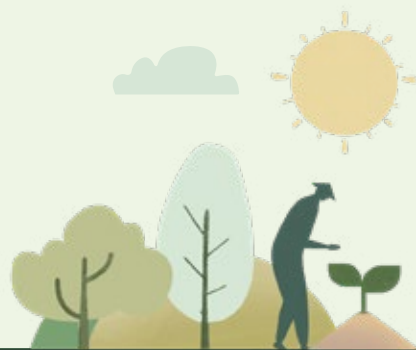
The Musim Mas Sustainability Pillars

Sustainability at Musim Mas means providing high quality and innovative palm oil products and derivatives in a responsible way.



Pillar 1:

Improve the Lives of Smallholders, Workers, and Communities



Pillar 2:

Deliver Positive Environmental Impacts



Pillar 3:

Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders



Pillar 4:

Drive Innovation in Sustainable Practices



About this Report

GRI 2-2, 2-3, 2-5

This is the fifth Musim Mas Group ('Musim Mas' or the 'Group') report, updating the Group's sustainability performance for the 2021 calendar year. It has been prepared with reference to the Global Reporting Initiative (GRI) Standards and, for the first time, Sustainability Accounting Standards Board (SASB) guidelines. GRI disclosures and SASB disclosures are included throughout the report and referenced under headings or sub-headings as GRI XXX-XX and FB-AG-XXx.x. This report is designed to be read in conjunction with the sustainability-related disclosures on our [website](#).

- » [SR2021 GRI Content Index](#)
- » [SR2021 SASB Index](#)

REPORT SCOPE AND BOUNDARIES

This report covers Musim Mas-owned upstream operations in Sumatra and Kalimantan, as well as certification, traceability and supply chain data for our refineries and kernel crushing plants (midstream). For the first time, we have included Group-level reporting, inclusive of midstream and downstream, for human resources and GHG data. We will work to streamline and improve the availability of data for future reporting.

Unless otherwise stated, performance data is from 1 January to 31 December 2021 and includes historical data where relevant and available. Given the timing of this report, we have also incorporated significant 2022 milestones, while our 2017-2021 performance data is available on our website.

- » [2017-2021 Sustainability Performance Data](#)

teams at the local and site levels. We are guided by international and sector-wide platforms and refer to leading benchmarks, such as the Zoological Society of London's Sustainability Policy Transparency Toolkit (ZSL SPOTT), the Carbon Disclosure Project (CDP), EcoVadis and, for the first time, the World Benchmarking Alliance's Food and Agriculture Benchmark.

We engaged technical consultants from the Consortium of Resource Experts (CORE) and Earthqualizer to review supply chain-related disclosures in this report. The scope of these reviews covered materiality, responsiveness to stakeholder concerns, and sustainability issues and also included feedback on improvements.

VERIFICATION AND ASSURANCE

Information and data published in this report that are relevant for the sustainability certification schemes have been audited by certification bodies. We have also contracted Ernst & Young LLP (EY) to provide limited independent assurance on selected disclosures in this report, including our GHG calculations submitted to the Roundtable on Sustainable Palm Oil (RSPO).

- » [Independent assurance statement](#)

STAKEHOLDER INCLUSIVENESS AND REVIEW

To ensure that we are responsive to themes and topics important to all stakeholders, we have conducted stakeholder consultation with our customer base, financial institutions, an environmental research program partner, and a social NGO. We also engaged our operational





2021 Summary Progress

Pillar 1:

Improve the Lives of Smallholders, Workers, and Communities



Primary SDGs to which we contribute:



2021 highlights, unless otherwise stated

Employees	Communities	Smallholders
<ul style="list-style-type: none"> ✓ Conducted Verité labour assessment at 4 Musim Mas mills with integrated plantations ✓ 96.2% of employees covered by collective bargaining agreements, 100% in Indonesia ✓ In addition to minimum wage, paid upstream workers in-kind benefits ≥90% of minimum wage ✓ 52% reduction in accident frequency rate since 2017 ✓ 77% reduction in severity rate since 2018 ✓ Land set aside for employee fruit and vegetable gardens doubled compared to pre-pandemic levels to support food security (34.6 ha in 2021) 	<ul style="list-style-type: none"> ✓ Operated 27 clinics with free healthcare for workers and local communities ✓ CSR contributions of IDR 21.3 billion, >60% allocated to schools ✓ 12 schools, 9 kindergartens, and 48 childcare centers run by Musim Mas 	<p>SCHEME SMALLHOLDERS:</p> <ul style="list-style-type: none"> ✓ 100% of scheme smallholders covered by KKPA and VDP programs ✓ 89.5% of scheme smallholder area RSPO certified ✓ Scheme smallholders collectively earned IDR 185.75 million, 2.3x of 2019 <p>INDEPENDENT SMALLHOLDERS:</p> <ul style="list-style-type: none"> ✓ 36,681 independent smallholders covered by Musim Mas programs ✓ 2,295 independent smallholders RSPO certified with Musim Mas assistance ✓ First 1,226 independent smallholders ISPO certified with Musim Mas assistance ✓ New research program with ETHZ and IPB to study the conditions under which supply chain sustainability initiatives can lead to reduced deforestation while safeguarding smallholder inclusion

Target	Target year	Progress in 2021, unless otherwise stated	Status
Zero fatalities	Ongoing	Three fatalities in 2021	Not achieved
Maintain Smallholders Hubs in key landscapes for independent smallholders	Ongoing	4 Smallholders Hubs operating: the first was established in Aceh Tamiang in 2020 followed by 3 in 2021, namely in Aceh Singkil, Riau-Siak, and Subulussalam	Achieved



2021 Summary Progress

Pillar 2: Deliver Positive Environmental Impacts



Primary SDGs to which we contribute:



2021 highlights, unless otherwise stated

Emissions & Energy	Operational Efficiency	Conservation	Fire-Free Programs
<ul style="list-style-type: none"> ✓ 9.5% reduction in upstream GHG emission intensity in 2021; 52% lower than 2006 baseline 	<ul style="list-style-type: none"> ✓ Operating 100% zero-waste mills 	<ul style="list-style-type: none"> ✓ 28,453 ha set aside for conservation, (>1/3 the size of Singapore) ✓ 35% increase in conservation area since 2017 	<ul style="list-style-type: none"> ✓ Conducted >160 fire trainings
<ul style="list-style-type: none"> ✓ 16th methane capture built; 575,075 MT CO₂e avoided from all methane capture facilities 	<ul style="list-style-type: none"> ✓ 6.75 million GJ of energy generated from PKS and fiber 	<ul style="list-style-type: none"> ✓ Commenced 2020 partnership program with SEARRP to assess our conservation impacts over the last decade 	<ul style="list-style-type: none"> ✓ 74 villages under Fire Free Village Program (FFVP), covering >450,000 ha
<ul style="list-style-type: none"> ✓ >95% of upstream energy consumed comes from renewable resources 	<ul style="list-style-type: none"> ✓ Received 11 Green PROPER Awards – the highest number of PROPER Awards for a palm oil company 	<ul style="list-style-type: none"> ✓ Renewed partnership with Tesso Nilo National Park Foundation for human-elephant conflict reduction initiatives 	<ul style="list-style-type: none"> ✓ Rewarded 42 villages for remaining fire-free
<ul style="list-style-type: none"> ✓ >33.9 million kWh of electricity generated from methane exported to the national grid 			

Target	Target year	Progress in 2021, unless otherwise stated	Status
Maintain water usage intensity below 1.2m ³ /MT FFB processed	Ongoing	Achieved mill water usage intensity of 1.13 m ³ /MT FFB [#] for RSPO-certified mills, a reduction of 3.4% from 2020	Achieved
Phase out ten pesticides (POIG commitment)	2021	6 pesticides phased out, and 1 used only in emergencies. Extension granted for remaining 3 while trials are being undertaken and/or alternatives become available in Indonesia.	Delayed Target revised to 2022
Equip 17 of 18 mills with methane capture facilities	2022	Commissioned 16 th methane capture in 2021	On track
Reduce GHG emission intensity by 55% at RSPO-certified mills against 2006 baseline	2025	52% overall reduction in emission intensity against 2006 baseline	On track
Traceability targets – see Pillar 3			

EY has performed limited assurance procedures on these figures.



2021 Summary Progress

Pillar 3:

Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders



Primary SDGs to which we contribute:



2021 highlights, unless otherwise stated

Supplier Progress On NDPE	Systems to Improve Supplier Assessments	Landscape Programs	Sustainability Assessments
<ul style="list-style-type: none"> ✓ 100% traceable to mill (TTM) ✓ 94% traceable to plantation (TTP) 	<ul style="list-style-type: none"> ✓ Launched new No Deforestation, No Peat (NDP) Risk Management Framework 	<ul style="list-style-type: none"> ✓ ~9.2 million ha[#] of suppliers' concessions monitored for deforestation¹ 	<ul style="list-style-type: none"> ✓ EcoVadis: Awarded Silver Medal
<ul style="list-style-type: none"> ✓ 85.6% of volumes sourced from suppliers 'delivering' on No Deforestation commitments, based on NDPE IRF 	<ul style="list-style-type: none"> ✓ Began developing new supplier Human Rights Due Diligence based on Verité assessment 	<ul style="list-style-type: none"> ✓ Kept stakeholders updated on landscape programs through the Musim Mas Aceh strategy website and the Siak-Pelalawan Landscape Program website 	<ul style="list-style-type: none"> ✓ Ranked 3rd of 100 companies assessed by ZSL SPOTT in 2021 ✓ 2021 CDP assessment results: Forests: A- Water Security: B Climate Change: B-[#]

Target	Target year	Progress in 2021, unless otherwise stated	Status
100% of new suppliers committed to NDPE	Ongoing	All new suppliers submitted commitments to NDPE	Achieved
Conduct workshops on NDPE for 100% of supplying mills	2025	94% of supplying mills have attended Musim Mas workshops, up from 76% in 2020	On track
Obtain a commitment from 100% of supplying mills to abide by NDPE principles	2025	Obtained commitments from 93% [#] of supplying mills	On track
Ensure 100% of suppliers have completed the Musim Mas Self-Assessment Tool (SAT)	2025	77% [#] of suppliers have completed the SAT, up from 60% in 2020	On track
Achieve 100% traceability to supplier groups' plantations, including to suppliers' independent smallholders, using risk-based traceability ²	2025	Achieved 93%, up from 80% in 2020	On track
Achieve 100% traceability to place of production ³	2025	Achieved 94% overall TTP/place of production, up from 83% in 2020	On track

Note: Our NDPE Roadmap was launched in September 2019 and will be reviewed and updated in 2022.

1 The monitoring covers our suppliers' concessions at group level in Indonesia, Malaysia and Thailand.

2 Traceability falls under Pillar 2 of Musim Mas' Sustainability Policy but is reported under Pillar 3 for the purposes of this report.

3 Traceability to place of production means traceability to where FFB is produced, e.g., a company's plantation or concession or a smallholder's plot of land.

EY has performed limited assurance procedures on these figures.



2021 Summary Progress

Pillar 4:

Drive Innovation in Sustainable Practices

Primary SDGs to which we contribute:



2021 highlights, unless otherwise stated

✓ Landscape/smallholder innovation: Establishing smallholders hubs in priority landscapes	✓ Landscape/smallholder innovation: Advancing regenerative agriculture amongst independent palm oil smallholders in North Sumatra	✓ Landscape/smallholder innovation: Addressing deforestation risks in Aceh
✓ Smallholder digital platform innovation: Develop new digital finance and financial learning platform (AgriON)	✓ Supply chain risk management innovation: Launched new No Deforestation, No Peat (NDP) Risk Management Framework	✓ Musim Mas' plantations' CPO yield/ha 1.75 times higher than the global average

Primary SDGs to which we contribute:



Cross-cutting Pillars: Sustainability Certification



2021 highlights, unless otherwise stated

✓ 15 mills RSPO certified , comprising 100% of mills integrated with plantations and 83% of total mills ⁴	✓ 100% of Indonesian midstream facilities RSPO SCCS certified	✓ 55% increase in certified sustainable palm oil and 284% increase in certified sustainable palm kernel oil at Musim Mas refineries from 2019 to 2021	✓ Musim Mas' wholly-owned refinery in Malaysia is Malaysian Sustainable Palm Oil (MSPO) SCCS certified
✓ 11 out of 17 PTs ISPO certified		✓ 100% of RSPO-certified mills POIG verified	✓ 100% of mills ISCC certified

Target	Target year	Progress in 2021, unless otherwise stated	Status
100% of entities in Indonesia ISPO certified	2025	11 Indonesia upstream PTs are certified against the ISPO standard, up from 5 entities in 2020	On track

⁴ Musim Mas operates 18 mills, of which 15 are integrated with plantations and therefore certifiable against the RSPO Principles and Criteria.



Chairman Statement

[GRI 2-22]

Dear friends, colleagues, and partners,

I am pleased to introduce the 2021 Musim Mas Sustainability Report. This year's edition is broader in scope, covering not only our upstream operations but also introducing group-level reporting for selected disclosures. It also includes a precursor of our approach to a sustainable coconut supply chain for the first time.

Palm oil commodity prices have risen in the last year, and demand has grown, but markets have been moving erratically. Musim Mas has promptly met these sudden challenges and remained resilient during these uncertain times while growing our business and increasing our revenue.

A good part of our success was made possible by the depth of our commitment to sustainability, climate change mitigation, and human rights. We are ready to meet the new regulations and requirements of governments across Europe, the United States, and the United Kingdom, increasingly asking palm oil exporters to better assess and monitor our supply chains.

I am incredibly proud of our ongoing work to reduce Musim Mas' greenhouse gas emissions. In 2021, we installed a sixteenth methane capture facility and achieved a 52% reduction in GHG emissions at our upstream operations against our 2006 baseline. These results are supported by our facilities operating on 95% renewable energy. We are also in the process of mapping out the carbon footprint of the entire group, including creating models



of our Scope 3 emissions, which will be the building blocks for our emissions reduction strategy.

One of the highlights of 2021 was partnering with the South East Asia Rainforest Research Partnership (SEARRP) to assess and analyze ten years of Musim Mas conservation data. We are using science to review our conservation approach and maximize our impact on protecting biodiversity and reducing emissions.

Beyond our operations, we strive to set an example for our industry peers and upstream suppliers, from whom we source more than 85% of our crude palm oil (CPO). In recent years, we have expanded the adoption of our No Deforestation, No Peat and No Exploitation (NDPE) Roadmap by monitoring, assessing, and engaging with our suppliers. Our ultimate goal is a verified 100% deforestation-free supply chain by 2025. We have made tremendous progress in mapping our supply chain,



Chairman Statement

increasing traceability to plantation (TTP) from 60% in 2019 to 94% at the end of 2021. We continue to engage with suppliers. More than 90% of them have attended our workshops, and 77% have completed the Musim Mas Self-Assessment Tool (SAT).

In recent years, commercial and civil society stakeholders have increasingly raised concerns about labour conditions and human rights violations at oil palm plantations. Musim Mas has strived to ensure our operations are exploitation-free for years. We first partnered with civil society organization Verité in 2016 to assess working conditions at our operations and improve our labour policies and procedures. We conducted a second assessment in 2021, and both of these exercises concluded that our employment practices and systems are robust. However, these studies identified gaps in communicating and implementing our policies, and Musim Mas will focus on addressing these issues in 2022 and 2023. We have also carried out multiple decent living wage studies since 2019, showing that our workers are paid 140% more than the Roundtable on Sustainable Palm Oil (RSPO)-mandated decent living wage. Musim Mas is also proud of reducing accident rates by 52% in the last five years.

While the industry makes strides to address deforestation risks in supply chains, we must place equal emphasis on eliminating human rights risks. In 2021, Musim Mas partnered with Verité to develop and test tools that assess our suppliers' human and labour rights practices, making it possible to identify and eliminate exploitation across our entire supply chain.

Throughout our history, Musim Mas has put smallholders at the center of our sustainability efforts. Since 2015, Musim Mas has refined, retooled, and revamped our engagement programs to integrate as many independent smallholders as possible into our sustainable supply chain. Our programs teach basic agricultural skills, sustainability requirements, personal finance, and other soft skills that help improve farmers' livelihoods. Musim Mas has trained more than 36,000 smallholders over the years. In 2021, we helped nearly 2,300 independent smallholders become RSPO certified and more than 1,200 obtain ISPO certification. These smallholders have received almost IDR 11 billion, or USD 733K, from the sale of their RSPO credits. As part of our model to scale up outreach, we have trained 177 local government agricultural officers so that many more independent smallholders can have the opportunity to improve their livelihoods.

Musim Mas believes the palm oil industry can play a pivotal role in protecting endangered landscapes and species, fighting climate change, providing decent living wages to our workers, and improving the livelihoods of vulnerable and marginalized people and communities. We are committed to partnering with multi-stakeholder, multi-commodity organizations, civil society and private sector entities, community leaders and members, and our people, to ensure prosperity for all. There is much work ahead, but we will strive to make a difference and lead by example as we progress towards sector-wide solutions that create impactful and lasting change.

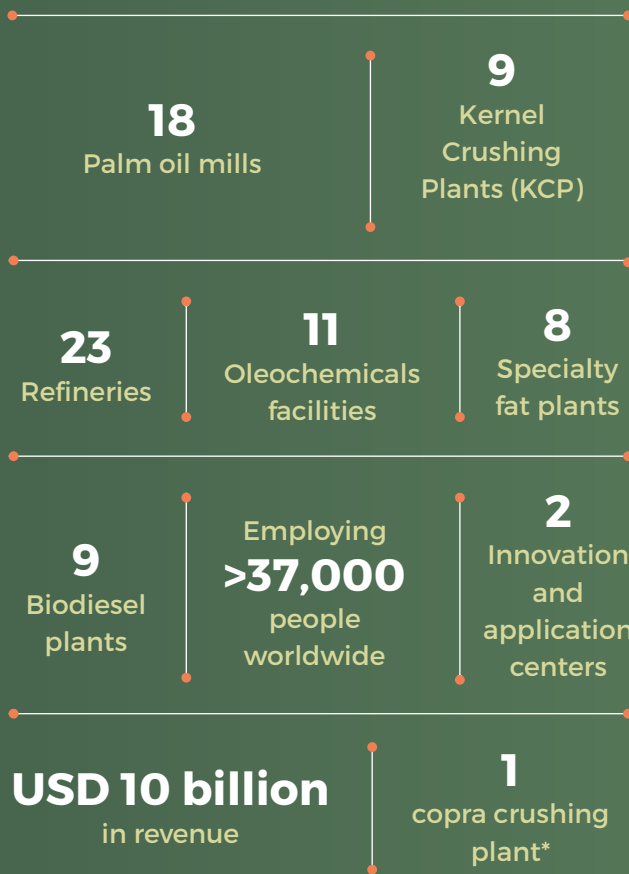
I wish you continued good health, safety, and prosperity.

Executive Chairman and CEO,
Musim Mas Group



About Musim Mas

Landbank:
199,358 ha



[GRI 2-1, 2-6, 3-3, 201-1] [SASB FB-AG-000.A, FB-AG-000.B, FB-AG-000.C]

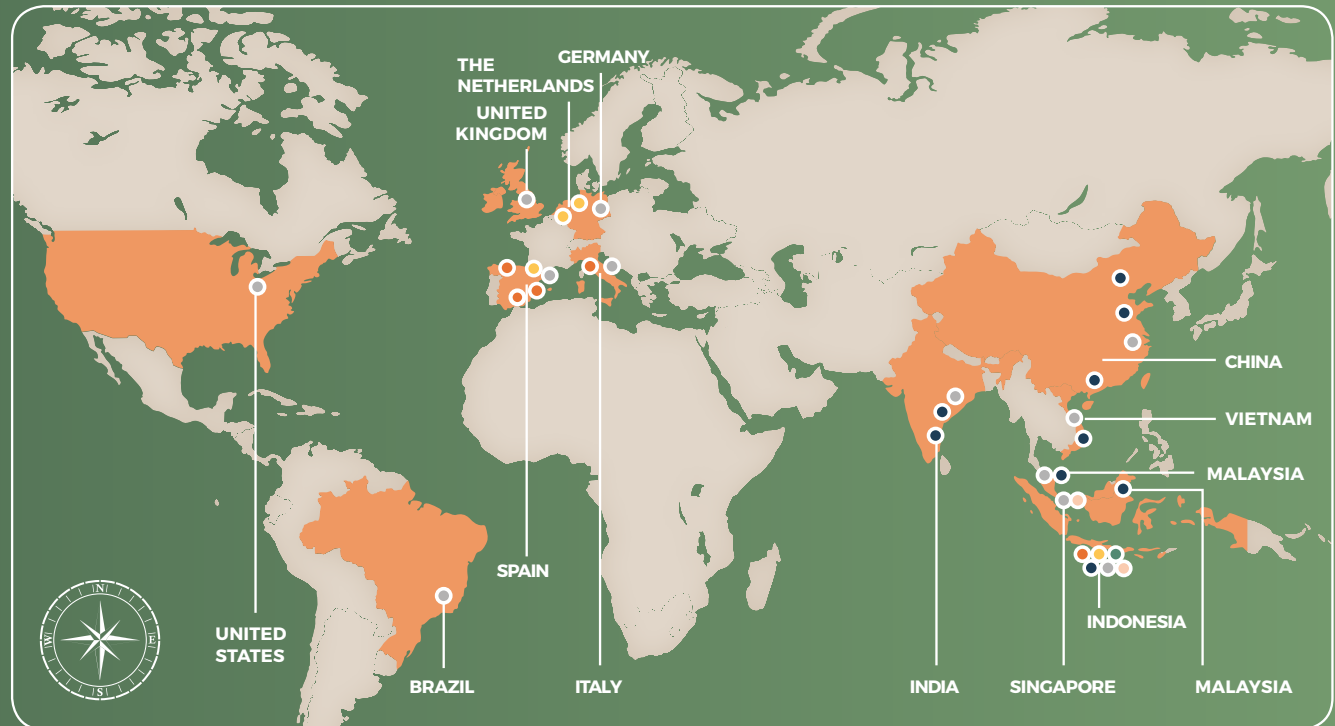
OVERVIEW

Musim Mas Group ('Musim Mas' or the 'Group') is a private limited company with corporate headquarters in Singapore and main operations in Indonesia. We operate across every link in the palm oil supply chain, from plantations to milling, refining, manufacturing, and commercial and consumer sales across 13 countries. Our integrated business model enables us to produce a broad range of raw and processed palm-based industrial and consumer products serving the global market.

» Musim Mas' integrated business

GLOBAL AND OPERATIONAL PRESENCE

» Global presence



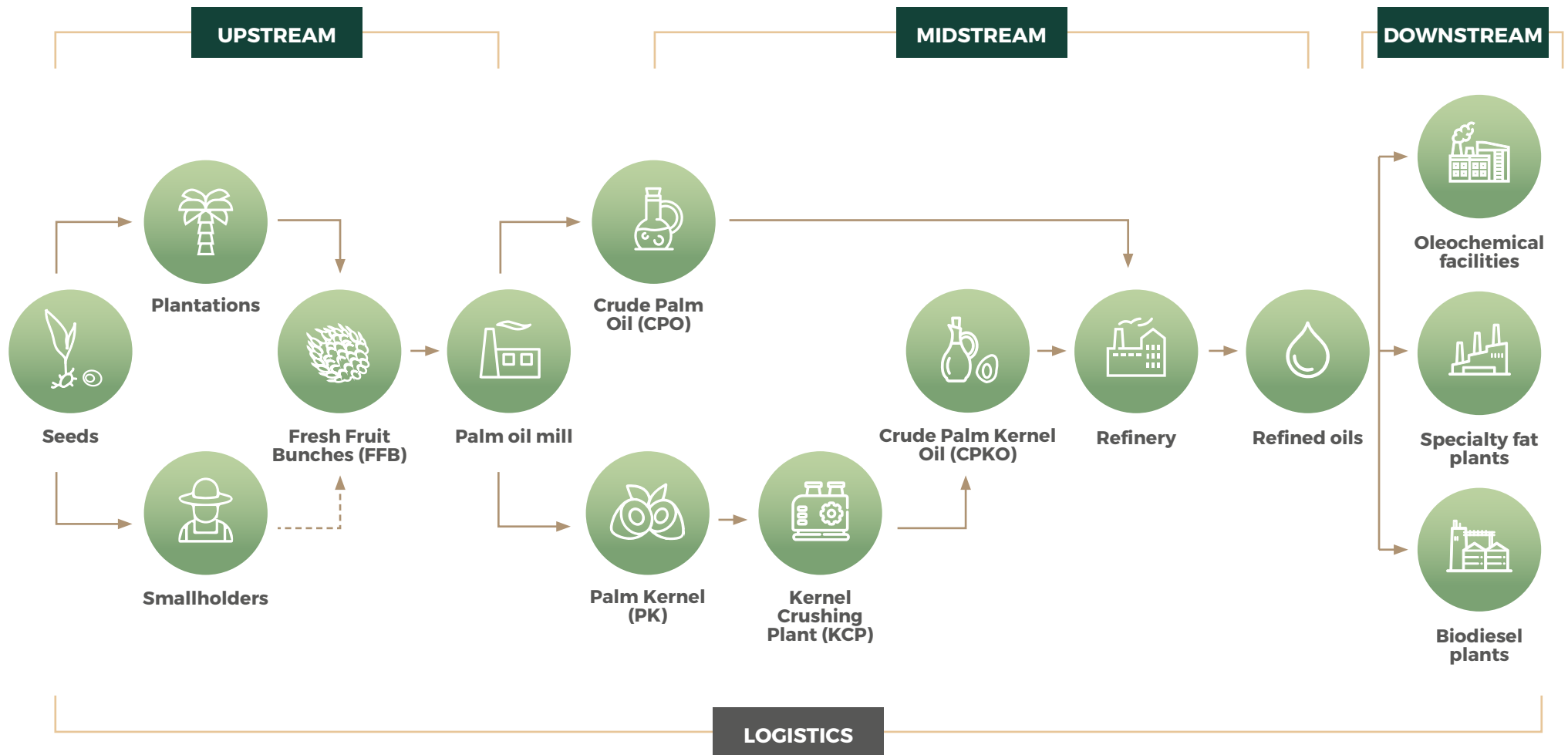
Note: Our coconut operations are out of scope of this report.

● Biodiesel Plant ● Oleochemicals Plant ○ Plantation ○ Refinery ○ Marketing Office ● Innovation and application centers



About Musim Mas

Musim Mas' integrated business



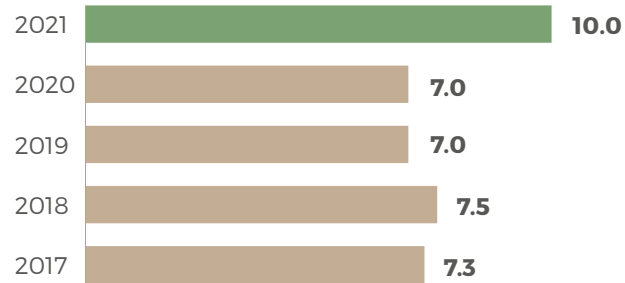


About Musim Mas

2021 BUSINESS IN BRIEF

The Group's revenues reached USD 10 billion in 2021 resulting from the increased performance of the palm oil industry due to greater demand during the pandemic. This growth can be attributed to the soaring price of crude palm oil and palm-based products sold to market.

Revenues 2017-2021 (USD billion)

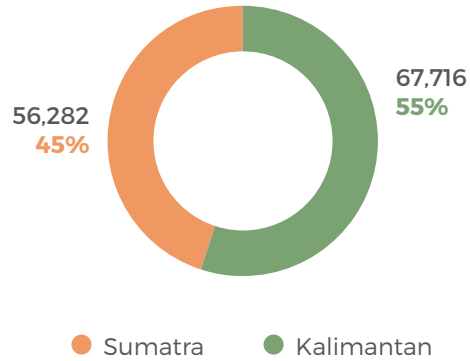


Upstream operations

Musim Mas has a landbank of 199,358 hectares of land in Sumatra and Kalimantan, our main operational base, of which 123,998 hectares are planted with oil palm.⁵

Musim Mas planted area by region 2021 (ha, %)

Total: 123,998 ha



⁵ Musim Mas had previously owned two concessions in Papua. The development rights Musim Mas have since lapsed.

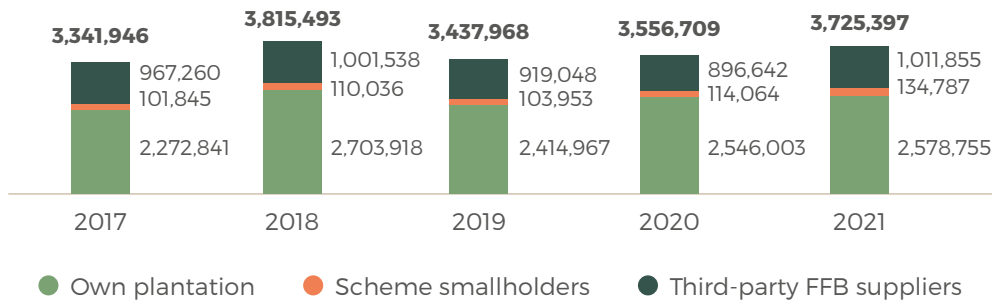


About Musim Mas

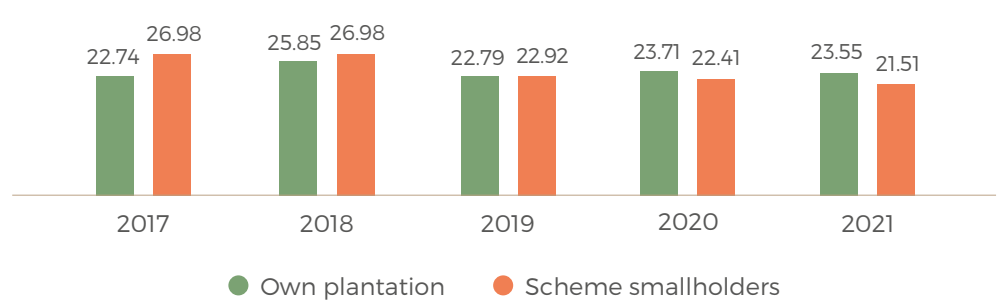
Production at our mills steadily increased over the last two years. In 2021, we processed approximately 3.7 million tonnes of fresh fruit bunches (FFB), yielding more than 843,000 tonnes of crude palm oil (CPO) and more than 214,000 tonnes of palm kernel

(PK). Yield and extraction rates remained steady at our operations. Compared to 2018, FFB yields for scheme smallholders have decreased by 20% in 2021. This was mainly due to new areas coming into harvesting.

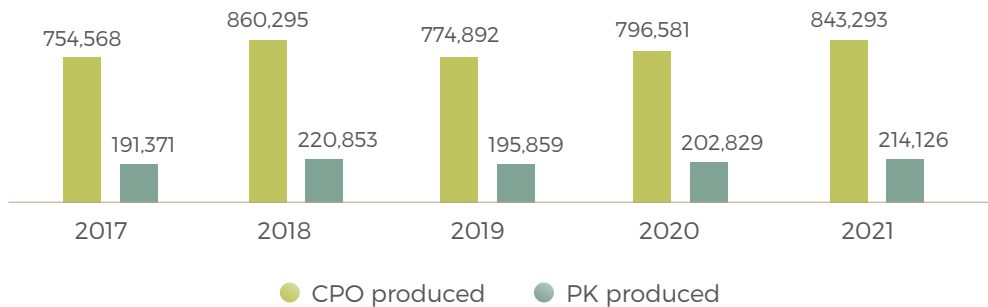
FFB processed by source 2017-2021 (MT)



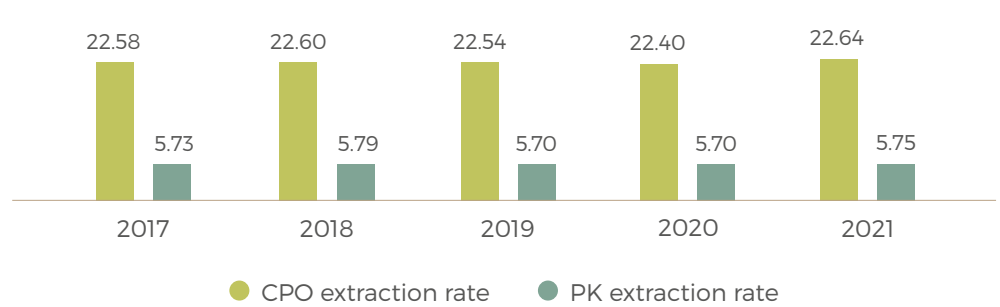
FFB yield 2017-2021 (MT FFB/ha)



CPO and PK produced 2017-2021 (MT)



Extraction rates 2017-2021 (%)





About Musim Mas

Midstream operations

We operate one of the largest refinery networks in Indonesia, refining CPO into refined oils for further processing. We also operate kernel-crushing plants that process PK into crude palm kernel oil (CPKO), which is further processed at our refineries. Palm kernel expeller is sold for other purposes, including animal feed and biomass fuel.

Downstream operations

Thanks to our vertically integrated palm oil business, our oleochemical facilities and specialty fats plants produce an extensive portfolio of downstream products for consumer goods and industrial use. We make high-quality ingredients for commercial business products, our own brands of packaged consumer goods, and act as a private label manufacturer for many well-known brands.

We also have oleochemical plants which produce oleochemicals for the production of cosmetics, lubricants and other chemical products. In addition, we have biodiesel plants.

» Musim Mas brands and products



R&D

Musim Mas operates two research and development (R&D) centers, one in Singapore and another in Indonesia. These centers leverage advanced technologies and the latest innovations, allowing us to anticipate market and product trends by analyzing customers' preferences and needs. They also create value by providing worldwide technical support and developing new palm oil applications.

» Musim Mas R&D

Other businesses

The Group also operates a copra crushing factory in Sulawesi, Indonesia, that processes dried copra into crude coconut oil and copra meal expeller.

Musim Mas products are sold and distributed worldwide via our extensive and efficient logistics network, comprising a fleet of storage tankers, tugboats, and other vessels. This network is supported by our Singapore-based global marketing division, Inter-Continental Oils and Fats (ICOF), with satellite offices in Asia, Europe, the United States, and South America.



Approach to Sustainability

OUR COMMITMENT TO NDPE

[GRI 2-23, 2-24]

Since 2014, we have made clear our sustainability commitments to No Deforestation, No Peat and No Exploitation (NDPE). Given the size and reach of our operations, we consider ourselves to be pushing the envelope in meeting these commitments and continually review our policies to stay abreast of evolving issues and adapt to the environments we operate in. Our [2020 Sustainability Policy](#) is our latest guiding document and applies to Musim Mas' global operations and the third parties we work with, including suppliers and contractors.

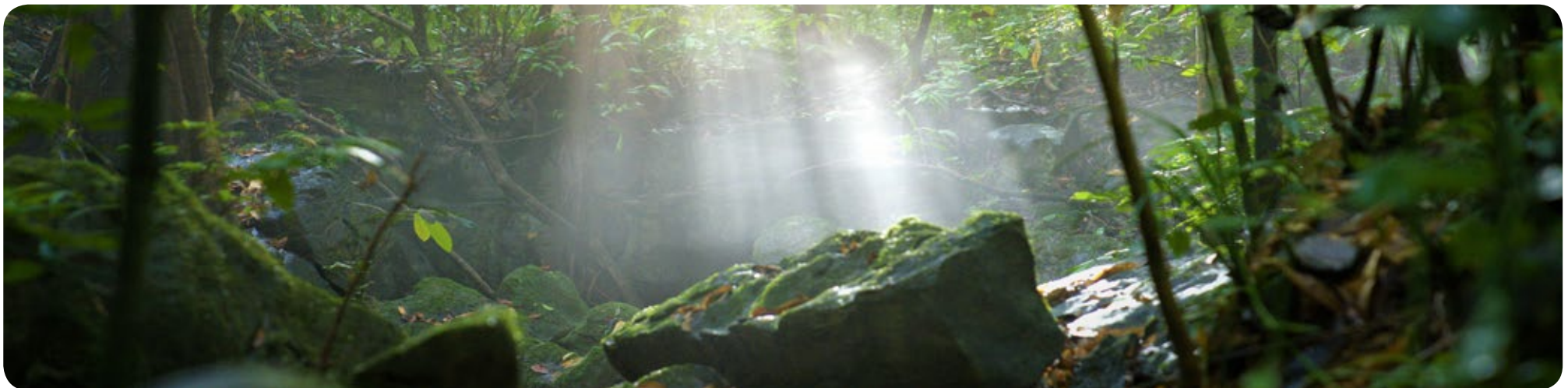
We continue to implement and exceed the strictest sustainability standards across our operations. Our focus

remains on our extensive supply chains. More than 80% of our crude palm oil (CPO) supply comes from external suppliers, who source from large and small plantations, outgrowers, smallholders, and fresh fruit bunch (FFB) agents. Our independent mills also source indirectly from independent smallholders through agents. Because our suppliers are at different stages of their respective sustainability journeys, we implement a combination of programs to support them in meeting our NDPE requirements.

In 2019 we developed an [NDPE Roadmap](#) to keep us on track to meet our supply chain commitments and in 2022, we will update its targets and metrics to better reflect lessons learnt and the realities on the ground.

SUSTAINABILITY AND COCONUT

We developed our initial NDPE policy to address the risks and opportunities related to our global palm oil operations, our main business. Our latest policy extends our commitments to our coconut processing and refining operations, which make up a small percentage of our total volumes and sales. **In 2021, we began engaging suppliers by conducting NDPE supplier workshops and collecting traceability information. In 2022, we will begin to map our copra supply chain.** We are exploring platforms and partnerships to engage with other actors on collective issues. We will share our progress in future reports.





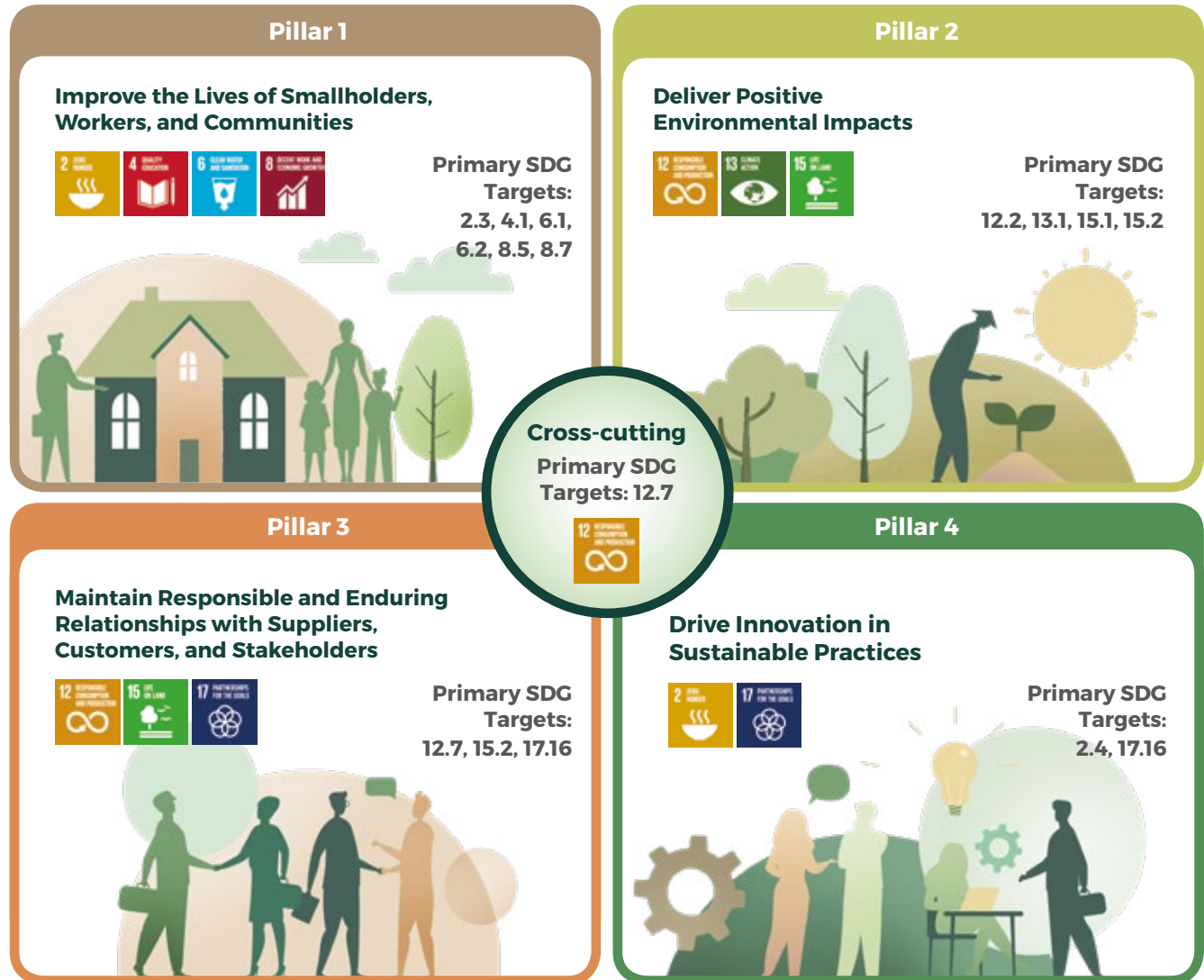
Approach to Sustainability

CONTRIBUTING TO THE UN SDGs

Musim Mas actively contributes to the United Nations' Sustainability Development Goals (SDGs). We recognize the role businesses play in ensuring the success of the UN's agenda and the importance of using a common language to communicate our sustainability progress. In 2021, we mapped our material topics and program objectives to the SDGs and their targets, outlining the primary and secondary SDGs to which we contribute. For this report, we revisited this assessment as part of our annual materiality update and, for the first time, mapped our midstream and downstream risks and opportunities.

Below is how we map the key material topics that fall under the Musim Mas Sustainability Policy pillars to the set of primary SDGs to which we contribute. These are the priority goals and targets we will report against and to which we will demonstrate our contributions. We have also aligned our program objectives to a set of secondary goals to which we contribute. **For the results of our mapping work and our contributions to primary and secondary SDGs, see page 76.**

For clarity, we have included the corresponding SDG logos throughout this report to indicate which of our measures contribute to the primary goals and targets identified.





Approach to Sustainability

MATERIALITY

[GRI 2-14, 2-29, 3-1, 3-2]

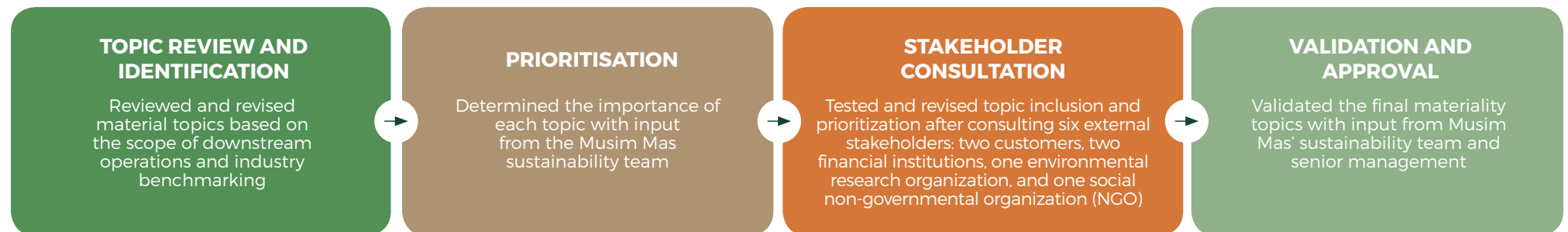
Our reporting covers the topics most material to our business and stakeholders. These environmental, social, and governance (ESG)-related topics are updated annually based on Musim Mas' actual and potential impacts. **In Q1 2022, we conducted a comprehensive review of our material topics in line with the expanded scope of this report to include our midstream and downstream operations.** We have aligned key material topics with the four pillars of our Sustainability Policy and the SDGs. For an overview of this, see [page 76](#).

Changes to material topics

Since our last report, we made the following changes to the material topics:

New topics	<ul style="list-style-type: none"> • Business continuity, replacing the previous Revenue topic • Product safety and quality • Waste management • Landscapes
Merged topics	<ul style="list-style-type: none"> • The previous Supplier engagement and verified NDPE progress, and Traceability topics were merged and renamed to Supply chain engagement and transparency • The previous Human rights and Labour rights topics were merged as Human rights and labour rights • Stakeholder collaboration now includes the previous Government engagement and Transparency topics • Occupational safety and health now includes the previous COVID-19 topic • Community rights and community relations now includes the previous Food security topic
Updated topic names	<ul style="list-style-type: none"> • Climate risk and adaptation (previously Carbon GHG emissions) • Governance and business ethics (previously Anti-corruption and corporate governance) • Conservation and management of HCV, HCS and peat areas (previously Conservation and management of HCV/HCS/peat) • Grievance resolution (previously Complaints and grievance resolution)

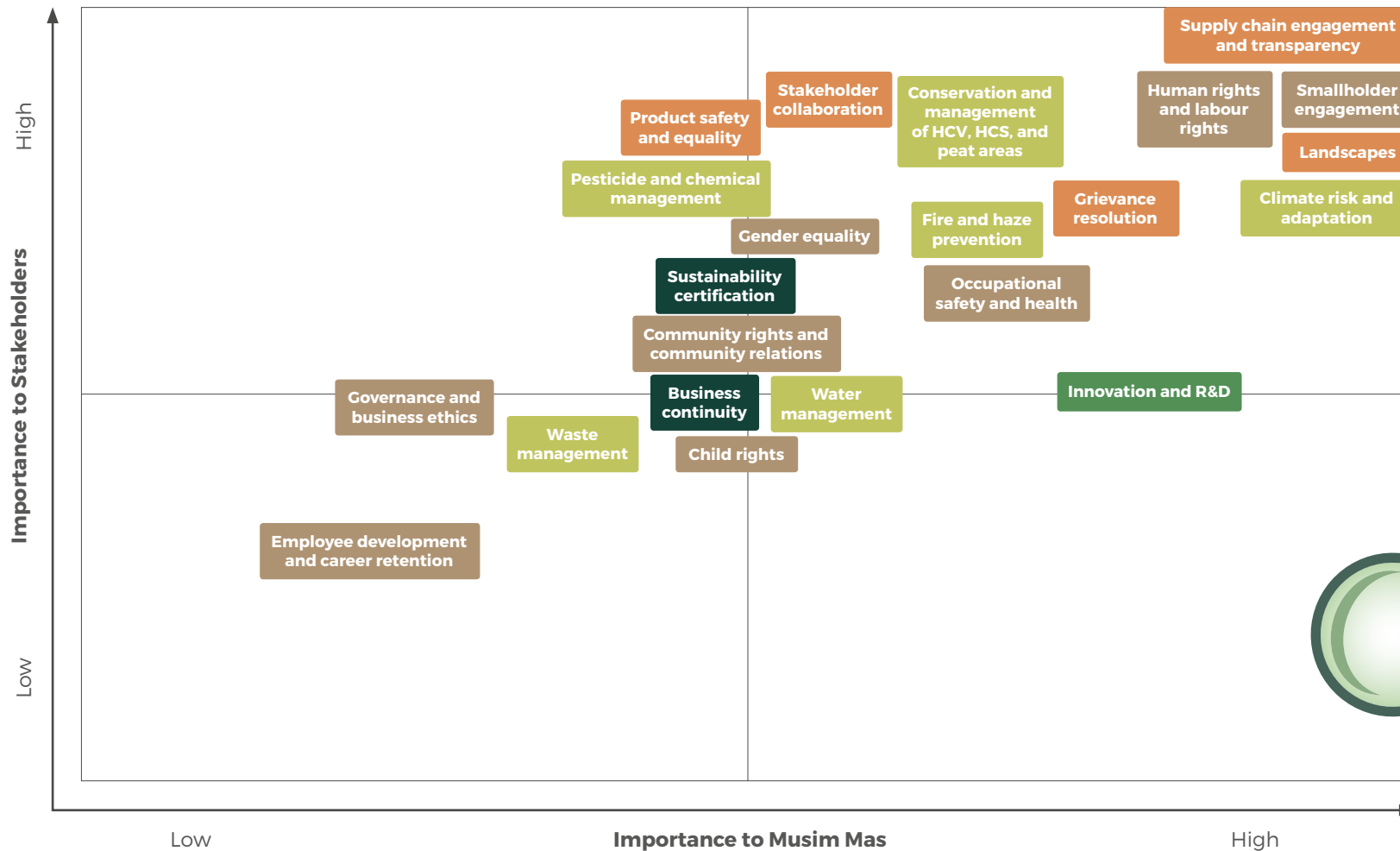
Approach





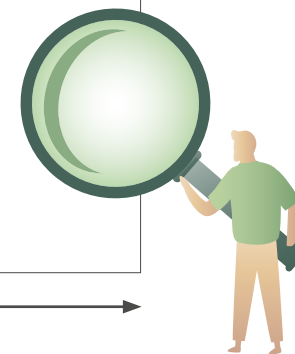
Approach to Sustainability

MATERIALITY MATRIX



Musim Mas' Pillars

- Improve the Lives of Smallholders, Workers, and Communities
- Deliver Positive Environmental Impacts
- Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders
- Drive Innovation in Sustainable Practices
- Cross-cutting pillars





Approach to Sustainability

CORPORATE AND SUSTAINABILITY GOVERNANCE

[GRI 2-9, 2-11, 2-12, 2-13, 2-24, 3-3, 405-1]

The Musim Mas Board of Directors ('Board') considers sustainability a core component of our corporate identity, ensuring that environmental, social, and governance (ESG) material issues are embedded into our business strategies and decisions. The Board is led by our Executive Chairman and Chief Executive Officer (CEO) and comprises four members, including one woman.

Our senior management team meets quarterly to review key ESG issues and performance. Our Executive Chairman leads these meetings, and monthly reports are provided to the Board. Our Director of Sustainability oversees the implementation and execution of our sustainability policy commitments and leads our sustainability team. The team comprises more than 150 employees that carry out the day-to-day implementation of our sustainability commitments, including dedicated teams on the ground to implement training programs and smallholder outreach. An external senior strategic advisor supports our sustainability management initiatives.

» [Sustainability governance structure](#)

» [See Business ethics section](#)

Grievance mechanisms

[GRI 2-25, 2-26]

All stakeholders have access to transparent and accountable grievance mechanisms. All stakeholders, including employees, can file complaints through our whistleblowing procedure, which guarantees anonymity, creating a safe avenue for grievances to be raised without fear of reprisal or dismissal. At plantations, workers can submit complaints through mechanisms available in and around our operations.

We also provide a grievance mechanism for external stakeholders to raise complaints against Musim Mas – or our suppliers – on potential breaches of our sustainability policy and certification commitments.

» [Grievance mechanisms](#)

» [Grievances](#)





Approach to Sustainability

CERTIFICATION AND COMPLIANCE

[GRI 3-3]



One of our top priorities is supporting and complying with leading industry sustainability certification and verification schemes.

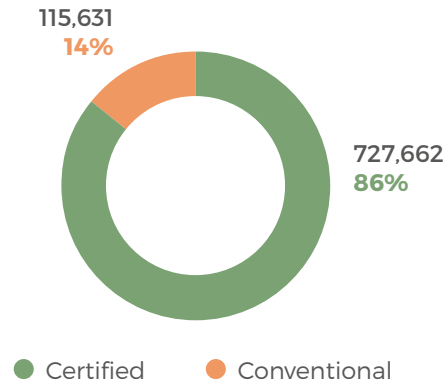
Upstream certification

Musim Mas was the first company in Indonesia to join the Roundtable on Sustainable Palm Oil (RSPO) when it was established in 2004 and remains an active member. Of our 18 mills, 15 are integrated with plantations, and thus can be certified against the RSPO Principles and Criteria (P&C). **As of June 2021, all 15 mills are RSPO certified (100%).** Our RSPO-certified landbank, including scheme smallholders, totals 152,880 hectares, making up 77% of our total landbank. All RSPO-certified mills are also verified to the Palm Oil Innovation Group (POIG) Charter.

In 2021, we produced 727,662 tonnes of certified sustainable palm oil (CSPO) and 182,458 tonnes of certified sustainable palm kernel (CSPK), making up 86% and 85% of our total mill output, respectively.

We aim to audit the three remaining independent mills under the RSPO Supply Chain Certification Standard (SCCS) by 2022.

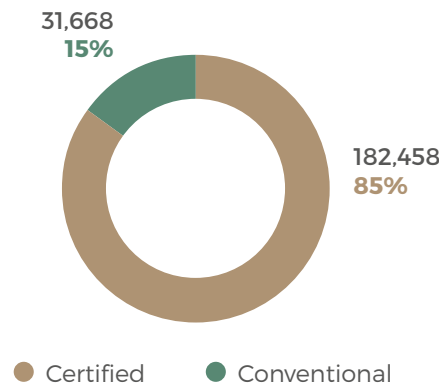
RSPO-certified CPO produced at mills 2021 (MT, %)



We also adhere to the Indonesian Sustainable Palm Oil (ISPO) standard, the country's national sustainable palm oil certification scheme. **As of December 2021, 11 upstream PTs in Indonesia are certified against the ISPO standard, six more than in 2020. In January 2022, a 12th PT achieved ISPO certification.**

18 of our mills are certified to the International Sustainability and Carbon Certification (ISCC). We also adhere to the Italian National Certification System for Biofuels and Bioliquids (IT SNC).

RSPO-certified PK produced at mills 2021 (MT, %)





Approach to Sustainability

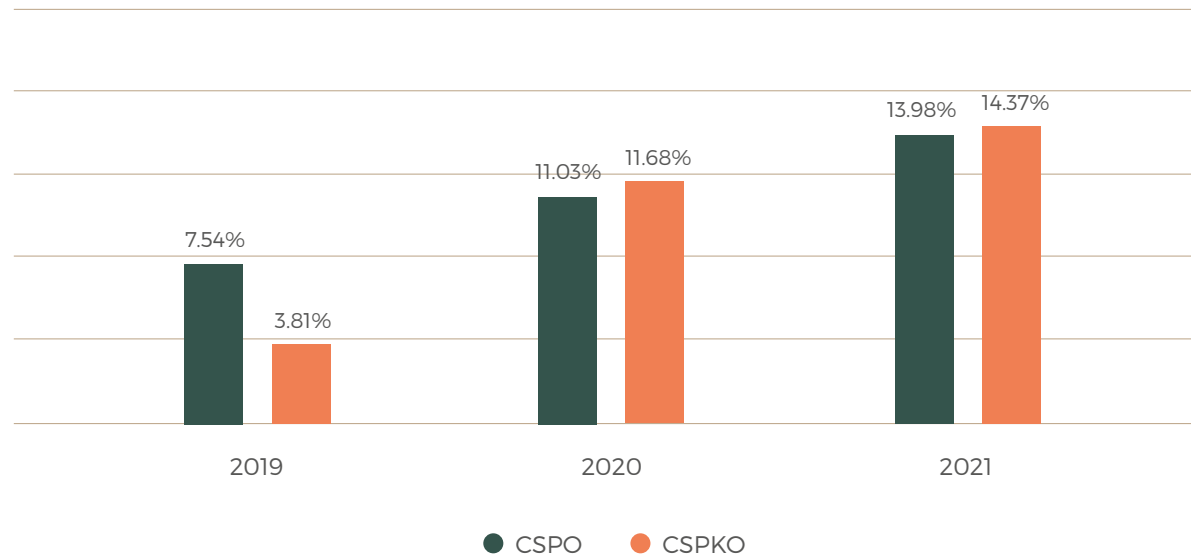
Supply chain certification

Our certification efforts span our entire value chain. **As of 2021, 100% of our Indonesian refineries are fully certified against the RSPO SCCS.⁶ Over the last three years, our refineries have steadily increased their uptake of certified CPO and crude palm kernel oil (CPKO) for processing, with a 55% increase in CSPO and a 284% increase**

in Certified Sustainable Palm Kernel Oil (CSPKO) from 2019 to 2021. In 2021, 5.4% of our total product sourced was RSPO Segregated (SG) and Identity Preserved (IP) oil.

Our only wholly owned refinery in Malaysia is certified against the Malaysian Sustainable Palm Oil (MSPO) SCCS standard.

RSPO-certified raw material sourced 2019-2021
(% of total volumes)
Refineries



⁶ We previously reported that all our downstream facilities worldwide were certified. We have restated this claim to make clear it only covers our Indonesian refineries.



About This Report

2021 Summary Progress

Chairman Statement

About Musim Mas

Approach to Sustainability

Improve the Lives of Smallholders, Workers, and Communities

Deliver Positive Environmental Impacts

Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

Drive Innovation in Sustainable Practices

Assurance Statement

Appendix

- The Musim Mas workforce
- Sustainability with smallholders
- Community rights and support
- Business ethics

01

Pillar 1: Improve the Lives of Smallholders, Workers, and Communities





- The Musim Mas workforce
- Sustainability with smallholders
- Community rights and support
- Business ethics

Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

As a major palm oil producer, putting our workers, communities, and smallholders first is a strategic component of our business objectives and an essential contribution to sustainable development. Musim Mas is committed to respecting human rights, labour rights, and land rights. We endeavour to establish a lasting, positive legacy everywhere we operate, which includes prioritizing the health and safety of those around us during the ongoing COVID-19 pandemic.

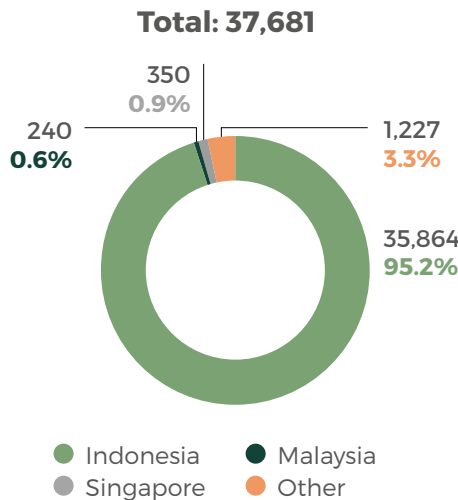
THE MUSIM MAS WORKFORCE Overview

[GRI 2-7, 3-3]

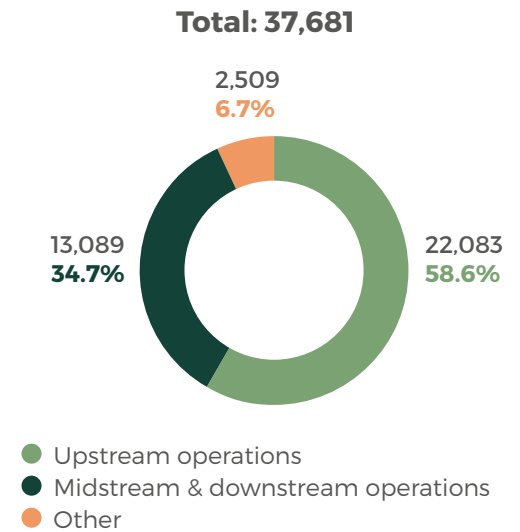
We employ 37,681 people worldwide, with Indonesia accounting for 95.2% of our workforce.

Of the total, 58.6% of our employees work at our upstream operations in Sumatra and Kalimantan. Another 34.7% are employed at our midstream and downstream facilities across Indonesia, Malaysia, and other countries, while 6.7% of our global workforce occupies positions at our sales and satellite offices.

Group employees by country 2021
(no., %)



Group employees by business segment 2021
(no., %)



Note: 'Other' includes employees at our logistics, marketing, sales and satellite offices outside the scope of this report.





- The Musim Mas workforce
- Sustainability with smallholders
- Community rights and support
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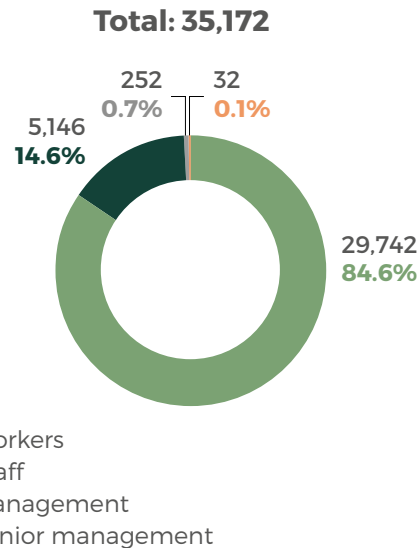
Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

Across our upstream, midstream and downstream operations, workers make up the majority of our workforce, accounting for 84.6% of our total employees. The remaining are employed as staff, management and senior management.

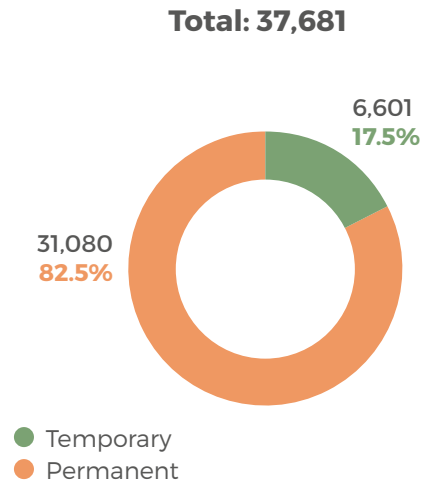
All employees occupy permanent, full-time positions, except in Indonesia, where we also employ temporary, short-term contract workers at our plantations and factories. At our plantations, these include seasonal workers that support harvesting activities during peak periods.

Temporary workers make up 17.5% of our total workforce.

Employees by category at operations 2021 (no., %)



Group employee by contract type 2021 (no., %)



Note: this excludes employees from sales and satellite offices.





- The Musim Mas workforce
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Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

Assessing labour conditions at Musim Mas mills and plantations

In August 2021, Musim Mas engaged Verité Southeast Asia – an organization addressing labour and human rights issues in companies and supply chains – to conduct an independent labour assessment at Musim Mas plantations. The study involved an assessment based of four mills integrated with plantations in Central Kalimantan, West Sumatra, and South Sumatra. This assessment builds on the 2016 Verité assessment.

Objectives:

- Determine best practices and recommend improvements based on gaps identified against the labour provisions in the Roundtable on Sustainable Palm Oil (RSPO) Principles and Criteria (P&C) 2018, Palm Oil Innovation Group (POIG) Charter, relevant

Verité Best Practice Standards, and other international standards on worker protection.

- Review and provide strategic input to guide the Musim Mas System Improvements Plan during the second phase of the program.

Due to the pandemic, the assessment was conducted remotely, primarily through Zoom and telephone conversations, and covered:

- **Facility and estate documents** such as written policies and procedures, collective bargaining agreements, employee files, payroll and working hour records, discipline and grievance records
- In-depth, **one-on-one interviews with randomly selected workers** representing a cross-section of

our workforce from each unit

- **Interviews with key executives at head office and on-site**, e.g., managers responsible for sustainability and compliance, recruitment, human resources (HR), general managers, and and health and safety personnel

In July 2022, Verité’s comprehensive report was finalized, and the full report was made available on our website. Some key findings and Musim Mas action plans are included in the relevant sections of this report. We have since reviewed Verité’s recommendations and are taking corrective actions to address the identified gaps.

» [Verité Social Compliance Assessment Report 2022](#)

Wages and working conditions

[GRI 3-3, 202-1, 401-2]



All salaries and employment conditions for staff and workers, including temporary workers, meet legal minimum wage standards in their respective regions. All men and women are paid equally, irrespective of gender, across all employee categories.

In addition, we provide employees at our upstream operations with in-kind benefits such as housing, healthcare, electricity, water, transportation, childcare, and education for school-age children. Our approach is aligned with and exceeds RSPO guidance on Implementing a

Decent Living Wage (DLW). Musim Mas assessed specific sites to confirm that workers are paid well above DLW requirements. The monetary value of the in-kind benefits we provide is equivalent to 90% or more of the minimum wage set by the Indonesian government.

Musim Mas conducted DLW assessments at seven sites since 2019. In 2021, DLW assessments were conducted at two sites, namely PT Maju Aneka Sawit (MAS) in Central Kalimantan and PT Guntung Idamannusa (GIN) in Riau, despite challenges from pandemic-related movement restrictions. **Our analysis showed that workers' salaries and in-kind benefits at these sites are significantly higher than the calculated DLW.**

Musim Mas wages and benefits vs. DLW assessments 2021 (IDR)

Site	PT MAS	PT GIN
Musim Mas salary + in-kind benefits	IDR 5,980,789	IDR 5,575,369
Calculated DLW	IDR 3,229,986	IDR 3,745,319
Difference	IDR +2,750,803	IDR +1,830,050

Benefits at our midstream and downstream factories differ from region to region, in line with applicable local and national laws.



- The Musim Mas workforce
- Sustainability with smallholders
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Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

Workforce diversity

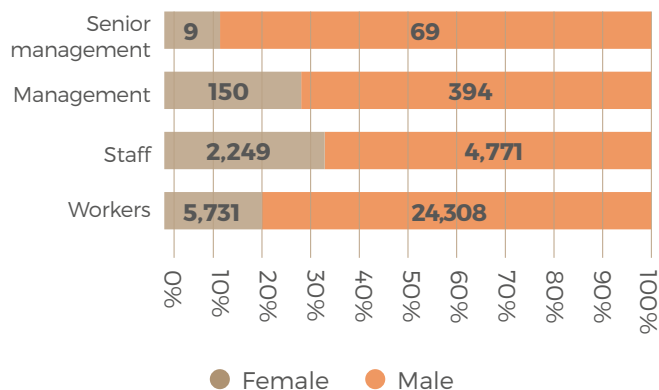
[GRI 3-3]

All employees are hired, promoted, and provided equal pay and opportunity based on merit without discrimination. We train our employees on our no discrimination policies.

Gender diversity

The Group employs 8,139 women, comprising 22% of our global workforce, including at our sales and satellite offices. At the Group level, nine women hold senior management positions, accounting for 12% of our senior management. All are based at our Singapore office. Women also make up 28% of management and 32% of staff. Across our upstream, midstream, and downstream operations, women make up 19% of all workers.

Gender diversity by employee category 2021 (no., %)



Promoting gender equality at plantations

At our plantations, we strive to promote gender equality and support the inclusion of women while supporting their wishes to balance household duties and childcare commitments with work. Some examples of our efforts include dedicated Gender Committees at every estate, issuing Family Cards to household heads regardless of gender, and equipping facilities such as breastfeeding areas and childcare centers at our operations. We actively engage external parties such as provincial Women's Empowerment Offices to conduct workshops and share knowledge with these Committees.

According to the Verité findings, women at our operations are generally satisfied with their involvement in our company activities. However, it did identify that some women workers whose spouses are also employed by the company are not fully aware of their allowances and entitlements as company employees. We will work to improve communication and inform all workers of the subsidies for which they qualify.

Freedom of association

[GRI 2-30, 3-3, 407-1]

All workers are free to join the labour union of their choice and participate in union meetings. We maintain positive relationships between management and union representatives and meet regularly to discuss matters such as wages, benefits, and leave. In Indonesia, we also offer support by regularly collecting workers' feedback through meetings of bipartite co-operation committees (*Lembaga Kerja Sama (LKS) Bipartit*) comprising company

representatives and workers. A total of 20,020 employees are members of trade unions.

We respect the rights of employees to be part of collective bargaining agreements (CBAs). These agreements adhere to government regulations and are valid for all employees. **Across the Group, 36,260 employees – or 96.2% of the Musim Mas workforce – are covered by CBAs.**

Musim Mas strives to ensure workers understand and have access to their CBAs in Indonesia. For example, CBAs are communicated to workers during union meetings and morning briefings. Additionally, copies of CBAs are provided to field supervisors and made available at or posted on the announcement boards at estate, mill, and union offices, where workers can freely consult them.

Employees covered under CBAs by region 2021 (no.)

Country	No. covered under CBAs
Indonesia	35,864
Malaysia	0
Singapore	0
Other	396
Total	36,260



- The Musim Mas workforce
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Pillar 1: Improve the Lives of Smallholders, Workers, and Communities



At Musim Mas, preschool-age children have access to childcare centres and kindergartens.

Ensuring no child or forced labour

[GRI 3-3, 408-1, 409-1]

Child labour

We do not tolerate child labour at our operations. Our recruitment policy prohibits the employment of any individual under the age of 18, and all job applicants are screened to ensure they meet minimum age requirements. We have integrated age-verification measures into our recruitment process, including interviewing all applicants, to prevent underage workers from entering our workforce. We have also implemented procedures to guide units' responses should children be found at

work sites. In these circumstances, parents are included in the remediation process and recovery actions. Physical and mental health examinations are carried out by qualified experts who can psychologically evaluate the affected children. These policies and procedures have been communicated to our employees repeatedly, including through workers' unions.

Musim Mas provides schools and daycare centers for children living in and around our plantations so parents can work without worrying about their children's safety and education.

Forced labour

Musim Mas strongly opposes forced or trafficked labour, and workers are free to move in and out of estates or resign without penalty. Our recruitment, selection, and hiring policies and procedures meet legal standards. Additional controls are incorporated into our procedures to prevent forced labour, debt bondage, and discrimination.

The risk of forced labour in the industry is considered high due to the employment of migrant workers at plantations in some producer countries. However, we do not employ any foreign workers at our Indonesian estates. When we do hire workers from other provinces, we do not retain the identification and travel documents. We do not use third-party recruitment or labour agents, and no fees are collected from workers. Any transportation payment made by prospective workers is fully reimbursable.

Access to grievance mechanisms

All workers have access to a transparent and accountable grievance mechanism without fear of reprisal or dismissal. We train our workers on our internal, site-level grievance procedure, and we regularly post reminders about the system on public bulletin boards. Employees can raise complaints using suggestion boxes at and around our operations, grievance logbooks at our administrative offices, contacting our Corporate Affairs Department (*Hubungan Masyarakat*) by phone, or through their labour union.

We strive to ensure workers are fully aware of the grievance mechanism and improve its effectiveness.



- The Musim Mas workforce
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Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

Safety and health

[GRI 3-3, 403-5, 403-9, 403-10] [SASB FB-AG-320a.1]

Musim Mas prioritizes the safety and health of our employees and has a dedicated Occupational Safety and Health (OSH) policy in place. We equip all employees at plantations, mills, and factories with the necessary personal protective equipment (PPE) and train them in safety and health issues pertinent to their roles.

Due to our vigilance and strict health and safety measures, our accident rates continue to improve dramatically. Since 2017, our accident frequency rate (FR), which measures productivity lost due to accidents, dropped 52%, from 16.71 to 8.06. The accident severity rate also dropped by 77% since 2018, from 43.50 to 10.16, indicating far fewer severe injuries at our mills and plantations.

COVID-19 health and safety measures

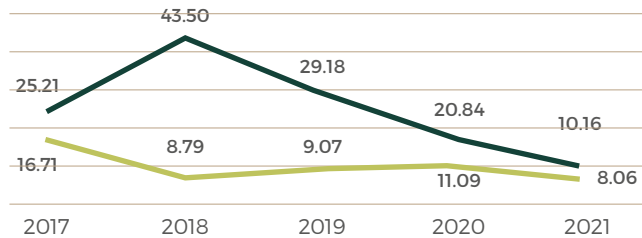
Since the start of the pandemic, we have set up COVID-19 task forces across our operations to oversee measures and procedures that minimize the risk of our employees contracting and spreading the virus. These task forces enforce strict guidelines on maintaining good hygiene, minimizing physical interaction between employees, and detecting potential cases. We conduct regular employee briefings on safety measures and provide all workers with hand sanitizer, masks, and other PPE. We also set up isolation centers with healthcare facilities and equipment to treat suspected and confirmed cases.

Employee development and talent retention

[GRI 3-3, 404-2]

We provide regular and relevant training to prepare workers and employees for their assigned roles. We also invest in capacity building and technical skills programs and offer development opportunities that help employees achieve their career goals while contributing to the company's growth. At our plantations, we also meet with workers to set their harvesting targets, which we then integrate into their performance assessments.

Accident frequency and severity rate 2017-2021
Upstream operations



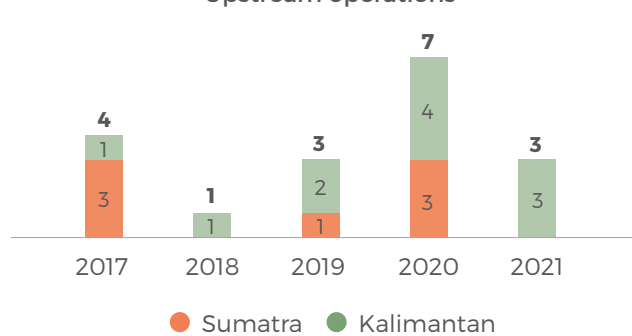
— Severity rate
— Accident frequency rate per million hours worked

Notes:

- 1 Accident frequency rate is calculated as the number of accidents divided by total hours worked, multiplied by 1,000,000.
- 2 Severity rate is calculated as the total number of days lost divided by the total number of accidents.

Despite our stringent health and safety measures, we deeply regret to report three fatalities at our upstream operations in 2021. Two resulted from road accidents during employees' homebound commutes after work.

Fatalities by region 2017-2021
(no.)
Upstream operations



A third death was the result of a severe injury after an employee slipped and fell while on harvesting duty. We take every fatality seriously, investigate the cause of each incident, and report our findings to the appropriate regional Manpower Office (*Dinas Tenaga Kerja*). We have conducted training to minimize the risk of such accidents recurring by raising awareness about road safety and requiring our workers to always wear PPE on site.



- The Musim Mas workforce
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Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

SUSTAINABILITY WITH SMALLHOLDERS

[GRI 3-3, 203-1, 203-2, 413-1, 413-2]

Smallholders, or individuals with farms smaller than 20 hectares, play a vital role in the Indonesian palm oil sector. However, smallholders face complex and interlinked barriers around yields, agricultural practices, land ownership, financial access, market access, and economies of scale. Musim Mas has established and manages a number of programs that support smallholders within our supply chain.

The pandemic disrupted our smallholder programs, but we continued to engage with our stakeholders remotely and found alternative ways to make progress on our goals. In 2022, we resumed much of our work on the ground, and our plans are back on track.

There are two types of smallholders in Indonesia: scheme smallholders and independent smallholders. Scheme smallholders operate under the auspices of an Indonesian Government program wherein plantation companies operate nucleus estates that assist and support surrounding community plantations. Independent smallholders are self-financed, self-managed, and self-equipped. Musim Mas operates programs that support both types of Indonesian smallholders.

Scheme smallholders

Musim Mas operates two scheme smallholder programs: the *Kredit Koperasi Primer Anggota* (KKPA) – for individual family units – and the *Kebun Kas Desa* or Village Development Program (VDP) – a community-based approach for villagers who collectively manage plantations. We set up these programs voluntarily before the Indonesian government established regulations in 2007 requiring companies to facilitate the creation of KKPA smallholder schemes in surrounding communities.

Musim Mas operates 38 local initiatives under our scheme smallholder programs, comprising 9[#] KKPA programs and 29[#] VDP programs. 4,044[#] scheme smallholders are enrolled in our KKPA program.

As of December 2021, all scheme smallholders operate 6,656 hectares of planted area – or 3.3% of our total hectareage. Due to the pandemic, training for scheme smallholders was put on hold in 2020, but we resumed activities in 2021 and carried out 185 training sessions across Sumatra and Kalimantan.



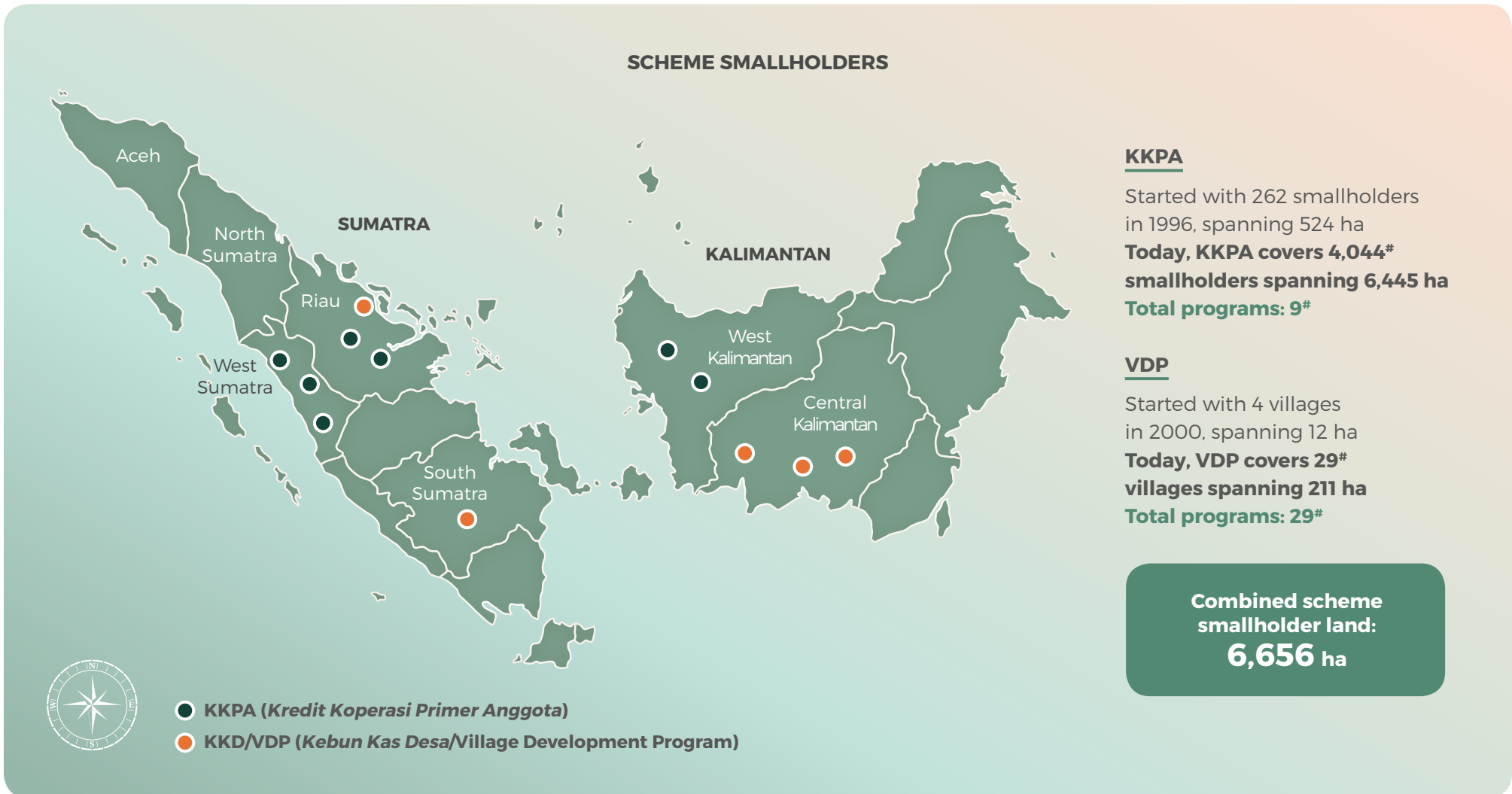
EY has performed limited assurance procedures on these figures.



- The Musim Mas workforce
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Pillar 1:
Improve the Lives of Smallholders, Workers, and Communities

SCHEME SMALLHOLDERS



EY has performed limited assurance procedures on these figures.

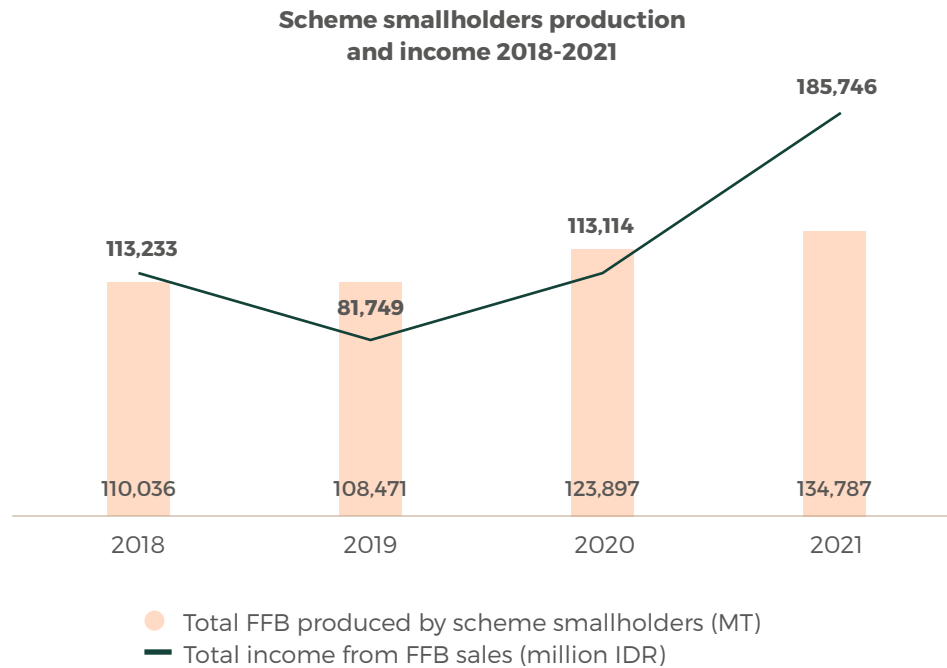


- The Musim Mas workforce
- Sustainability with smallholders
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- Business ethics

Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

Production and income

Despite lower yields, the total fresh fruit bunch (FFB) produced by KKPA and VDP smallholders increased by 24% from 2019 to 2021. This increase can be attributed to the additional production brought in by the new KKPA smallholders in 2021. **Record international crude palm oil (CPO) prices during the pandemic caused the total smallholder income from the sale of FFB to soar from IDR 113,114 million to IDR 185,746 million, 64% more than their income in 2020.**

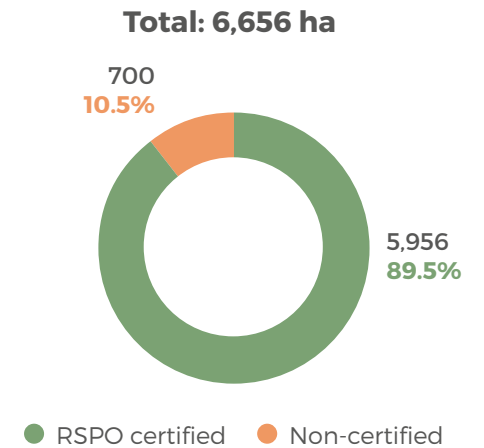


Note: data for 2018 and 2019 restated due to rounding adjustments.

Certifying scheme smallholders

We work with our scheme smallholders to obtain sustainability certification. **As of December 2021, 89.5% of the total land belonging to scheme smallholders is RSPO certified**, representing 5,956 hectares. In 2021, our smallholders supplied our mills with 112,409 tonnes of certified FFB, representing 83% of the total FFB sourced from scheme smallholders.

RSPO-certified vs non-certified scheme smallholder area 2021 (ha, %)



In addition, **five KKPA units are International Sustainability and Carbon Certification (ISCC) certified**. In March 2022, Indonesia Sustainable Palm Oil (ISPO) audits for our KKPA units commenced. The aim is to obtain ISPO certification by 2025 to meet Indonesian government requirements.



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Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

Independent smallholders

Musim Mas has developed and implemented various programs to integrate independent smallholders into the palm oil supply chain since 2015. We engage these smallholders and assist them in adopting efficient farming standards as industrial plantations by having them complete training modules covering good agricultural practices (GAP) and No Deforestation, No Peat, No Exploitation (NDPE) commitments. We take a landscape-level approach to our independent smallholder programs, which means establishing and running initiatives with other actors in specific regions to address barriers faced by smallholders due to local geographic and environmental conditions.

Our teams engaging independent smallholders in Indonesia adhere to strict pandemic health protocols. Nevertheless, we continue to conduct field visits on a one-on-one basis, albeit at a slower rate, all the while respecting health and safety protocols and travel restrictions in different parts of the country.

All training modules include the basics on GAP, environmental protection and NDPE. Depending on their location and how long we have worked with smallholders, we adapt our program modules accordingly. As smallholders progress, the curriculum evolves to better reflect local environmental conditions and international requirements and recognized global standards, such as the RSPO. These include helping independent smallholders acquire life skills to improve their livelihoods through personal financial literacy, proper nutrition, and other relevant soft skills.

Program approaches

Our engagement approaches have improved year after year through trials, lessons learnt, and milestones. Since 2015, we have rolled our three main programs: the Musim Mas-International Finance Corporation (IFC) Program, the Extension Services Program, and Smallholders Hubs. **Today, we have consolidated our approaches into two main streams to improve the livelihoods of independent smallholders: (1) Training for smallholders and (2) Training for trainers through Smallholders Hubs. As of December 2021, a total of 36,681 independent smallholders have received training.**

Modules for independent smallholder programs

Environment	Business Management
Replanting	Financial Literacy and Management
	Access to Financial Assistance
No Burning	Market Access and Sustainability Certification
	Good Agricultural Practices (GAP)
Social	Others
Gender Inclusion	Forming Farmers' Association
Food Security	Administrative and Miscellaneous Support
Alternative Livelihoods	

Independent smallholders trained by approach 2015-2021 (no.)

Approach	Smallholders trained	Village Extension Officers trained
Training for smallholders		
Engaged through Musim Mas mills	33,383	
Engaged through third-party mills	841	
Via collaborations	1,408	
Sub-total	35,632	
Training for Trainers: Smallholders Hubs		
Aceh Tamiang Hub	495	73
Aceh Singkil Hub	400	75
Dayun Hub (Riau-Siak)	154	1*
Subulussalam Hub	0	28
Sub-total	1,049	177
Total	36,681	177

* the one VEO trained at the Dayun Hub works in collaboration with Musim Mas' field assistant to deliver training to smallholders.



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Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

Training for smallholders

We train independent smallholders within the localities of both our mills and our third-party mills. We also conduct training through one-off collaborations when opportunities arise.

Overview of 'training for smallholders' program

MUSIM MAS-OWNED MILLS



- **Started:** 2015
- **Locations:** North Sumatra, Riau, Central Kalimantan and West Kalimantan
- **In collaboration with:** local governments, Indonesian banks
- Completed collaboration with IFC in 2020

THIRD-PARTY MILLS



- **Started:** 2017
- **Locations:** Aceh Tamiang and Musi Banyuasin
- **In collaboration with:** third-party mills

COLLABORATIONS



- **Program duration:** Ad hoc
- **Locations to date:** Pelalawan and Musi Banyuasin
- **In collaboration with:** UNDP and Rainforest Alliance

As of December 2021, we have trained 35,632 smallholders across Indonesia as a result of one of these three approaches. Of this total, 33,383 (94%) have been trained through eight Musim Mas mills and 841 (2%) through two third-party mills. We engaged the remaining 1,408 smallholders through one-off programs: one with Rainforest Alliance in Musi Banyuasin from August 2018 to April 2019 and another with the United Nations Development Programme in Pelalawan from September 2020 to September 2021.

Training for Trainers: Smallholders Hubs

We also extend training to independent smallholders indirectly by training local government agricultural officials known as Village Extension Officers (VEOs). The aim is to build their capacity by providing instruction on GAP and NDPE principles. The VEOs then support scaling up training programs for wider reach, by sharing their expertise with independent smallholders, equipping the latter with the skills and know-how needed for responsible farming.



Centralizing support for independent smallholders at the district level helps establish a pre-competitive approach allowing other palm oil companies within the region to also share their expertise and resources, regardless of whom the independent smallholders sell to. The integration with government efforts can also make the program more attractive to smallholders, who may be hesitant to buy into intervention by the private sector.

As part of our program, we provide ongoing support to VEOs who have completed training and help them address any barriers faced with their training roll-out. Key to our approach is collaborating with other actors in the region to support the work of Smallholders Hubs. Read more about our partnerships [here](#).

As of December 2021, we have helped set up four Smallholders Hubs. A total of 177 VEOs were trained through these hubs and have gone on to train 1,049 independent smallholders with a combined land bank of approximately 1,983 hectares. A further two hubs were established in Riau and West Kalimantan in February 2022. We will continue to update the number of trained VEOs and smallholders in future reports.

Overview of Smallholders Hubs

Started: 2020

Rolled out by: district governments/Bupati offices

Locations: Aceh Tamiang, Aceh Singkil, Dayun in Siak, and Subulussalam (as of Dec 2021). Sungai Linau in Riau and Sambas in West Kalimantan (as of 2022).

In collaboration with: local governments, buyers, NGOs and civil society organizations (CSOs), growers, consultants, implementation partners, and smallholders in specific



- The Musim Mas workforce
- Sustainability with smallholders
- Community rights and support
- Business ethics

Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

CERTIFYING INDEPENDENT SMALLHOLDERS

Together with our partners, we provide support that includes access to financing, assistance with land titles, and helping farmers' associations meet RSPO and ISPO certification requirements. We have supported many smallholders that are not necessarily supplying to Musim Mas, but moving forward we will focus on supporting those that do as part of our RSPO commitment.

RSPO certification

A total of 2,295 farmers have become RSPO certified as of December 2021 – the most significant number of independent smallholders certified by RSPO in Indonesia. We have more than tripled the number of certified smallholders since the first group of 705 smallholders in 2019. The total RSPO-certified area amounts to 5,945 hectares. **These smallholders have received almost IDR 11 billion, or USD 733K, from the sale of their RSPO credits.**

The success of our independent smallholder certification program has given farmers' associations direct access to the sustainable palm oil market, having sold RSPO Independent Smallholder Credits to consumer goods companies Unilever, PepsiCo, and Nestlé.

RSPO-certified independent smallholders

2019	705 independent smallholders
2020	2,092 independent smallholders
2021	2,295 independent smallholders

ISPO certification: first independent smallholders to become ISPO-certified

As part of our certification support programs, we have helped 1,226 independent smallholders become certified against the Indonesian Sustainable Palm Oil (ISPO) Ministry of Agriculture Decree No.38 of 2020 (ISPO 38/2020) standard. These smallholder plantations collectively comprise over 2,700 hectares of land, representing more than 20% of the 12,600 hectares of independent smallholders in Indonesia currently certified under the new ISPO standard. This is the largest group of independent smallholders to gain certification under the new ISPO requirements.





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Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

Partnerships to support independent smallholders



Engaging smallholders to address deforestation



Our training curriculum covers many components that support smallholders in complying with NDPE commitments. It includes training modules on improving yields, GAP and fire prevention.

In Aceh, most deforestation occurs outside plantation concession areas, so we have made significant investments in three Smallholders Hubs as part of our comprehensive Aceh Strategy. In 2020, we partnered with General Mills on a joint program to build and deliver extension services for independent smallholders in Aceh Singkil as part of an overall initiative to reduce deforestation while improving livelihoods.

In September 2021, we took a further step by entering into a partnership with AAK and Nestlé. The idea is to help independent smallholders increase yield and income from their existing farmland, while reducing the risk of encroachment into protected areas. The two companies have pledged to fund the first two years of a five-year outreach program that engages 1,000 oil palm independent smallholders and enrolls them in Smallholders Hubs.

[» Read more](#)



New decade-long project to advance regenerative agriculture



A first in the industry, Musim Mas is partnering with the Livelihoods Funds (L3F), SNV, Danone, L'Oréal, and Mars, Incorporated to advance regenerative agriculture amongst independent palm oil smallholders in North Sumatra.

The project, spanning ten years, aims to sustain a deforestation-free supply chain, regenerate 8,000 hectares of degraded oil palm plantation land, restore local biodiversity in 3,500 hectares, and improve the livelihoods of 2,500 independent smallholders.

The aim is to maintain and diversify revenues for independent smallholders through the promotion of cost-effective regenerative agricultural practices, palm oil agroforestry models for oil palm farms near riparian areas, farms approaching replanting periods and non-palm agroforestry models in highly degraded areas inside forests. Intervention in these sensitive areas will serve as a buffer between palm farms and protected forests.

The project will also empower smallholders by giving them access to financial facilities for replanting, which will be of value to independent farmers in North Sumatra, where 50% of oil palms in the project area are due for replanting within ten years. With training and coaching on financial literacy as well as support on composting unit business management and development provided

by SNV, smallholders will also be able to further improve their financial capability. Special attention will be placed on empowering women smallholders' to make decisions regarding access to and control over resources at the farm level.

Musim Mas will use remote sensing to assess the project's progress and impact on land-use change, deforestation, and land cover degradation around the project area. L3F will assess and monitor adoption of farm and soil management practices.

The project kicked off in 2021 and is being piloted on independent oil palm farmers enrolled in Musim Mas' smallholder programs.

[» Read more](#)





- The Musim Mas workforce
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Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

 **Digitizing finance with AgriON**  Musim Mas Innovation

In July 2021, iAPPS developed new digital finance and financial learning platform called AgriON – a scalable and bank-agnostic digital payment and financing solution that supports traceability and sustainability across the agricultural supply chain. This program is jointly supported by Musim Mas, MUFG Bank, and PT. Bank Danamon Indonesia Tbk (Danamon).

The AgriON platform aims to complement and strengthen Musim Mas’ existing financial literacy classes with a comprehensive series of workshops and introduces independent smallholders to products aligned with their financial goals, including customized savings plans. The platform will soon be available to independent smallholders enrolled in our smallholder program.

AgriON

AgriON is a global digital platform, leveraging on financial technology to generate meaningful and actionable insights and to promote inclusive financial access

 **New research program with ETHZ and IPB**

In December 2021, we entered into a research partnership with two universities, *Eidgenössische Technische Hochschule Zurich* (ETH Zurich (ETHZ)) in Switzerland and Indonesia’s *Institut Pertanian Bogor* (IPB). This collaboration will study the conditions under which supply chain sustainability initiatives can lead to reduced deforestation in the palm oil sector in Indonesia while safeguarding smallholder inclusion. In particular, this joint research project will use a combination of tools, including surveys, expert interviews, and village-level focus group discussions, to measure how Musim Mas independent smallholder programs, including Training for trainers: Smallholders Hubs, can contribute to sustainability goals. An industry first, the program launched in December 2021 in Sumatra. The project will be conducted over a five-year time frame and is supported by grants from the European Research Council and the Swiss National Science Foundation.

[» Read more](#)



SMALL PRODUCERS AND BIG RESPONSIBILITY SERIES

Musim Mas has launched a series of videos that provide a glimpse into the lives of five participants in our smallholder program. It demonstrates the impact of Musim Mas education and outreach programs that teach good agricultural practices and financial management and support sustainability certification. They also highlight these independent smallholders’ tremendous responsibility in producing sustainable palm oil.

[▶ Watch video here.](#)





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COMMUNITY RIGHTS AND SUPPORT

[GRI 3-3, 203-1, 203-2, 413-1]

Musim Mas continues to support rural communities, including, but not limited to, providing jobs, basic amenities, medical services, and education. Through long-term partnerships with communities and civil society organizations, we work to address critical issues impacting communities in the areas where we operate.

Upholding land and community rights

We respect and uphold the human rights of all community members and obtain Free, Prior and Informed Consent (FPIC) before any development or expansion of our operations. All new development plans are reviewed against the RSPO New Planting Procedure and its requirements.

We conduct participatory mapping exercises with local communities through a comprehensive consultative approach that involves ongoing direct dialogue, participation of community members, and focus group discussions. While this process helps map village boundaries, and infrastructure, it is also designed to help Musim Mas identify villages' concerns, needs and aspirations. These sessions allow us to collect information on villages' cultural and religious values, land use (including fruit and vegetable gardens for food security), and how people earn a stable livelihood. Results from these participatory exercises support our management, monitoring, land use, and development plans. Details on our participatory mapping approaches are found in our High Carbon Stock Approach (HCSA) assessments, available on the [HCSA website](#).

Our full-time team continuously engages with stakeholders from neighbouring communities at each of our locations to minimize the risk of disagreement or conflict. We also align our conservation and land use plans with our existing community programs.

Compensation for lost benefits or the relinquishing of rights is negotiated voluntarily, as agreed upon by the affected communities. When harm is caused to communities' land rights, we strive to ensure all issues are remedied. Open or outstanding conflicts with communities are settled through our dispute resolution mechanism.

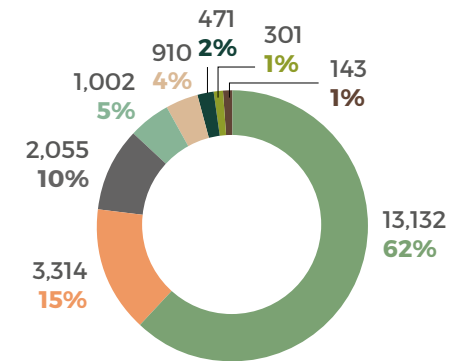
» [Grievance mechanism: dispute flowchart](#)

The Anwar Farim Foundation

Musim Mas operates a long-standing outreach initiative through the Anwar Karim Foundation, or Yayasan Anwar Karim (YAK), which runs programs that address economic development, community facilities, education, and infrastructure needs. In 2021, our monetary contributions amounted to IDR 21,329 million, of which 62% was allocated to Musim Mas schools. Investments supporting community activities (related to religion, social and culture), along with infrastructure, were the next highest expenditures.

CSR contributions 2021 (IDR million)

Total: 21,329 million



- YAK schools
- Religion, social, culture
- Infrastructure
- Environment
- Education
- Economic development
- Other
- Community health facilities





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Pillar 1: Improve the Lives of Smallholders, Workers, and Communities

Improving infrastructure

To ensure we are meeting communities' unique needs, we maintain an open dialogue with local representatives, including village heads. Every year, we invite villages bordering our operations to submit proposals on how to best use our infrastructure development budget. Over the years, these infrastructure development initiatives have improved these communities' access to essential services.



A focus on education

Since 2002, we have supported children's education through the Anwar Karim Foundation. Musim Mas has built and funded schools that provide an education to children of employees and some children from surrounding communities across our upstream operations. The curriculum taught at our schools is based on a syllabus approved by the Ministry of Education and Culture. Our schools have been recognized for their high teaching standards and excellent facilities.



We annually conduct surveys of children attending schools across our plantations. **Approximately 98% of the school-age children of mill and estate workers living at our plantations attend one of our 12 Yayasan Anwar Karim (YAK) schools⁷ or other schools in surrounding areas.** An additional 28 children from surrounding

communities attend YAK schools. The ratio of boys to girls who attend YAK schools is almost evenly balanced, with 48% of students enrolled being girls.

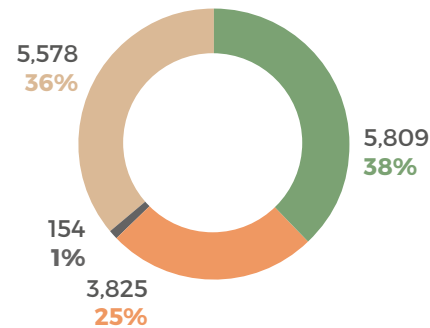
A total of 81 scholarships was awarded to deserving students in 2021.

All preschool-age children have access to one of our 48⁸ childcare centers and nine kindergartens.



School attendance of workers' children 2021 (no., %)

Total: 15,366



- Children attending YAK schools
- Children attending outside school
- Children of school-going age not attending schools
- Children not of school age

⁷ We previously reported running nine schools, referring only to our primary schools. Musim Mas also operates three secondary schools, for a total of 12 schools.

⁸ In the 2020 sustainability report, this was reported as 49 childcare centers. One new childcare center replaced two smaller centers in 2021.



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Covid support

In 2021, we continued to provide COVID-19 support to local communities and take proactive measures as the pandemic persisted. Some of these efforts included:

Distributing relief/care packages containing essential food and hygiene items to affected communities

Donating reusable bottles to COVID-19 unsung heroes (frontline workers, drivers, cleaners, and guards)

Donating fish seeds and fruit seeds to local farmers who continue to experience economic disparities

Holding continuous vaccination drives across our operations

Donating catfish seeds to local communities in Riau to ensure food security

Donating 20 oxygen concentrators to Indonesia's Ministry of Industry

BUSINESS ETHICS

[GRI 3-3, 205-2]

We are committed to conducting business fairly and ethically and prohibit all forms of corruption and bribery. These commitments are informed by our Code of Business Conduct and Ethics Policy that is communicated to Musim Mas employees as is relevant. In 2021, almost 25,000 employees received training on our anti-corruption policies and procedures. All stakeholders, including employees, can file complaints through our whistleblowing mechanism, which guarantees anonymity, enabling a safe avenue for grievances to be raised without fear of reprisal or dismissal.

Our Supplier Code of Business Conduct imposes similar obligations upon all external parties who supply to Musim Mas.

» Corporate and sustainability governance

In April 2022, Indonesia's Attorney General began investigating alleged irregularities in how Musim Mas issued export approvals to one of our subsidiaries. The investigation was triggered by Indonesia's Domestic Market Obligation (DMO) policy addressing the country's cooking oil supply, a policy that came into effect in February 2022 and was lifted in March. The Musim Mas Group has complied with and supported the law when it was in effect and is providing Indonesian authorities with relevant documentation in the spirit of full transparency as the legal proceedings continue. We will give updates on the case on the Musim Mas [website](#).



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About Musim Mas

Approach to Sustainability

Improve the Lives of Smallholders, Workers, and Communities

Deliver Positive Environmental Impacts

Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

Drive Innovation in Sustainable Practices

Assurance Statement

Appendix

- Our carbon footprint
- Energy management
- Conservation and restoration
- Monitoring and managing fires
- Chemicals and pesticides
- Water management
- Waste management

02

Pillar 2: Deliver Positive Environmental Impacts





- Our carbon footprint
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Pillar 2: Deliver Positive Environmental Impacts

We are committed to maintaining the ecological integrity of our plantations and surrounding areas and mitigating or minimizing the adverse impacts of our operations on the environment and neighbouring communities. Musim Mas regularly assesses

the impacts of our operations on climate and ecosystems using widely recognized tools and methodologies like the RSPO PalmGHG Calculator, Greenhouse Gas Protocol (GHG Protocol), Life Cycle Assessments, the Water Footprint Assessment Manual.

Commentary by Richard Piechocki, Head of Sustainability; **Li Huang Ang**, Senior relationship manager, Trade & Commodity Finance; **Shirley Goosens**, Sustainable business developer, Trade & Commodity Finance | Rabobank

Climate change and its impact on emissions and critical issues like biodiversity and social welfare is a topic that has gained traction in the last three years. Mitigating climate change is an essential topic for Rabobank, especially from a financial risk assessment point of view. For these reasons, we have developed a comprehensive climate strategy to guide our work and client engagements.

One of our new policy requirements is that all clients implement a climate action plan by 2024 aligned with the goals of the Paris Agreement and clearly state

how they will achieve net zero by 2050. These action plans must set credible science-based targets aligned with credible frameworks, including the TCFD and the Science Based Targets initiative's (SBTi) Forest, Land and Agriculture methodology, which is especially important for agribusinesses. In addition to emissions standards, we advise our clients to adopt the upcoming Taskforce on Nature-related Financial Disclosures (TNFD) to address nature-related business risks and opportunities.

Data collection is critical to Rabobank's response to the climate crisis. We have created an internal model to evaluate our clients' carbon reduction efforts, but we need sufficient data to apply it. We commend Musim Mas for comprehensively reporting the company's Scope 1 and Scope 2 emissions and now ask they begin collecting Scope 3 data so we can better understand their supply chain emissions.

Rabobank hopes to achieve excellence in sustainability by financing and helping clients like Musim Mas achieve their sustainability goals. By requiring our clients to adhere to our sustainability policies and international standards, we can help create an enabling environment in which banks can more readily finance companies that prove to be sustainable.

About: Richard leads Rabobank's global sustainability strategy. Li Huang and Shirley work in Trade & Commodity Finance, helping clients better align their sustainability performance with Rabobank's requirements. Rabobank provides trade banking facilities to Musim Mas and is the exclusive bank financing Musim Mas' biofuel business in Europe.



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OUR RESPONSE TO THE CLIMATE CRISIS

Musim Mas takes the climate crisis seriously and is strongly committed to minimizing greenhouse gas (GHG) emissions within our operations and supply chain. From upholding our No Deforestation (ND) and No Peat (NP) commitments to implementing programs with suppliers and smallholders, we are aggressively tackling climate-related risks on all fronts. Below is an overview of our initiatives with links to the relevant sections in this report:



POLICY & COMMITMENTS	Upholding ND And NP Commitments		
	Tracking emissions and emission intensity upstream	Investing in installing methane capture facilities at mills	Investing in increasing yields, reducing reliance on expansion
CLIMATE ACTION, ADAPTATION AND NO DEFORESTATION	Investing in R&D for resilient planting materials to withstand climate change-related weather changes and impacts	Investing in conservation initiatives, restoring degraded land, maintaining buffer zones	Managing fire outbreaks within and outside our concessions
	Tracking and optimizing energy and water use at upstream operations	Operating zero-waste upstream operations	
OPERATIONAL EFFICIENCY	Maintaining soil health and structure		Investing in reducing reliance on chemicals and fertilizers
	Committing to supporting a 100% deforestation-free supply chain by 2025	Engaging suppliers on ND and NP requirements, and assessing their progress against our commitments	
SUPPLY CHAIN ENGAGEMENT	Monitoring deforestation and fires within our supply chain		Training smallholders on good agricultural practices, ND and NP commitments

Developed and implemented by Musim Mas at the Group level, our climate change measures and reporting have steadily improved over the years. Our CDP Climate Change scores have also improved since our first assessment in 2017. Given industry trends and international stakeholders' requests, we recognize the need to adopt credible frameworks for climate reporting.

In 2022, we are working towards aligning our disclosures with Taskforce on Climate-related Financial Disclosures (TCFD) recommendations, which we will share in future reports. Musim Mas also is an active participant of the Taskforce on Nature-related Financial Disclosures (TNFD) discussions and the developments.



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OUR CARBON FOOTPRINT

[GRI 3-3, 305-1, 305-2, 305-3, 305-4, 305-5] [SASB FB-AG-110a.1, FB-AG-110a.2, FB-AG-440a.1]

Upstream emissions

We calculate emissions across our RSPO-certified upstream operations using the latest RSPO PalmGHG calculator. Total net emissions remained steady in 2020 and 2021 at about 2.6 million tonnes of carbon dioxide equivalent (MT CO₂e) across our mills and plantations in Sumatra and Kalimantan. Our primary emissions are from peat oxidation and land conversion.



Despite similar emission levels to the previous year, our mills produced more crude palm oil (CPO) in 2021. **As a result, our GHG emission intensity decreased by 9.5% in 2021, from 3.17 MT CO₂e/MT CPO to 2.87 MT CO₂e/MT CPO[#], which can be explained by an increase in CPO production but similar emission levels. This figure is 52% lower than our 2006 baseline, and we are well on track to reaching our 2025 target of a 55% reduction (2.68 MT CO₂e/MT CPO).**

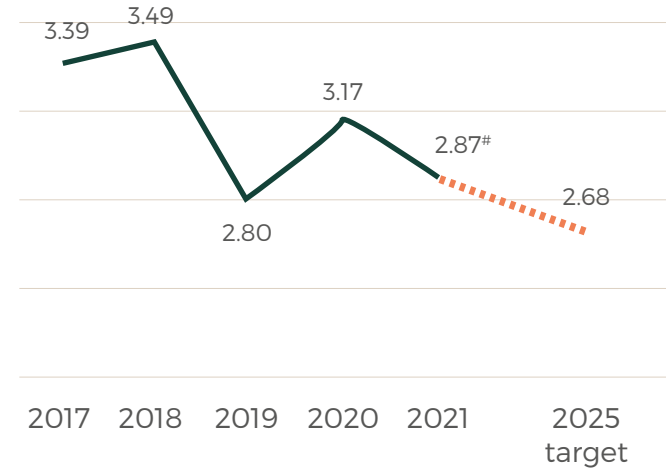
Upstream GHG emission sources and sinks 2020-2021

(MTCO₂e)
RSPO-certified operations



Upstream GHG emission intensity 2017-2021

(MTCO₂e/MT CPO)
RSPO-certified operations



EY has performed limited assurance procedures on these figures.



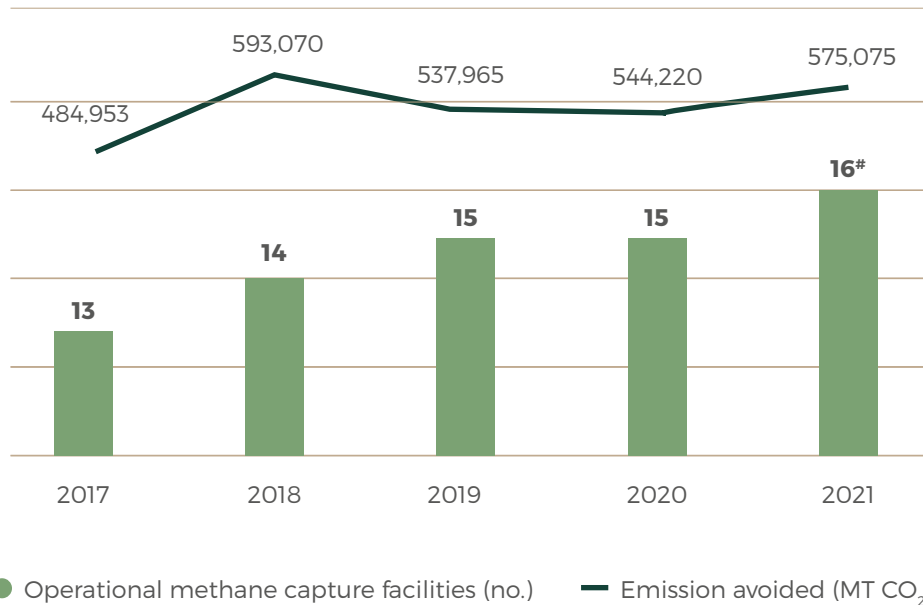
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Avoiding emissions with methane captures

In 2021, we built and commissioned a 16th methane capture in Central Kalimantan. This facility prevents the methane-rich biogas generated by the treatment of palm oil mill effluent (POME) from being released into the atmosphere. In 2021, we avoided the release of a combined 575,075 MT CO₂e using our methane capture facilities. The captured methane is instead churned into electricity to power mills, estates and workers' housing. We plan to build a 17th methane capture facility in 2022.

Emission avoided due to methane captures 2017-2021



EY has performed limited assurance procedures on these figures.

Group emissions

In 2021, the Group's net Scope 1 and 2 GHG emissions were 2,114,103 MT CO₂e. Approximately 80% of our emissions come from direct sources controlled by Musim Mas (Scope 1), while the remaining are indirect emissions generated by purchased electricity, steam, heat, and cooling used to operate our facilities (Scope 2).

We recognize that more than 70% of our Group's emissions come from our refineries and factories. In future, we will report our emission measurements and reduction initiatives in more detail.

Group Scope 1 and Scope 2 emissions by business activity 2021 (MT CO₂e)

	Oil palm plantations	Palm oil mills	Refineries and oleochemical plants	Other	Total
Scope 1	384,384	69,157	1,151,708	94,424	1,699,673
Scope 2	0	816	410,874	2,740	414,430
Total	384,384	69,973	1,562,582	97,164	2,114,103

We are currently validating our Scope 1 and 2 emissions and have started evaluating our Scope 3 emissions, i.e. the indirect emissions resulting from activities beyond the control of our organization. Calculating Musim Mas' Scope 3 emissions is both complex and challenging because our broad supply base comprises a variety of sources, including smallholders and businesses that lack the resources to provide the necessary data. We are looking to optimize how we collect Scope 3 emission data for future reporting. Per our customers' requirements, Musim Mas employs a life-cycle analysis approach to account for our products' carbon footprint.



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ENERGY MANAGEMENT

[GRI 3-3, 302-1, 302-3] [SASB FB-AG-130a.1]



We continue to implement programs to reduce our overall energy consumption, generate or utilize renewable energy, and drive operational efficiencies.

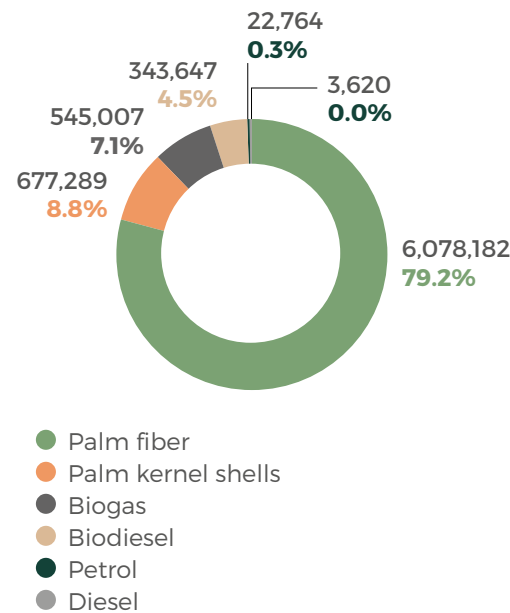
More than 95% of our upstream energy consumption comes from renewable sources, primarily by-products from the milling process. These include palm kernel shells (PKS), palm fiber and methane from POME. In 2021, we consumed 930,478 tonnes of PKS and palm fiber as boiler fuel across all our mills, amounting to 6.75 million gigajoules (GJ) of energy.

Our methane capture facilities harness methane generated by the treatment of POME to generate electricity which is then used to power our mills, estates, and workers' housing. In 2021, the total energy generated from methane consumed amounted to 545,007 GJ. All surplus electricity we generate is exported to the national grid when possible. The total electricity exported was 33.9 million kilowatt hours (kWh) in 2021.

Less than 5% of our energy comes from biodiesel, diesel, and petrol.

In 2021, our energy intensity amounted to 7.25 GJ per tonne of CPO/PK produced (GJ/MT CPO/PK).

Energy consumption in Indonesia 2021 (GJ, %)
Upstream operations



Methane capture facility at one of our mills.

We recognize our refineries and factories are energy-intensive operations. We will report on our energy use and initiatives in more detail in future.





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CONSERVATION AND RESTORATION

[GRI 3-3, 304-3]



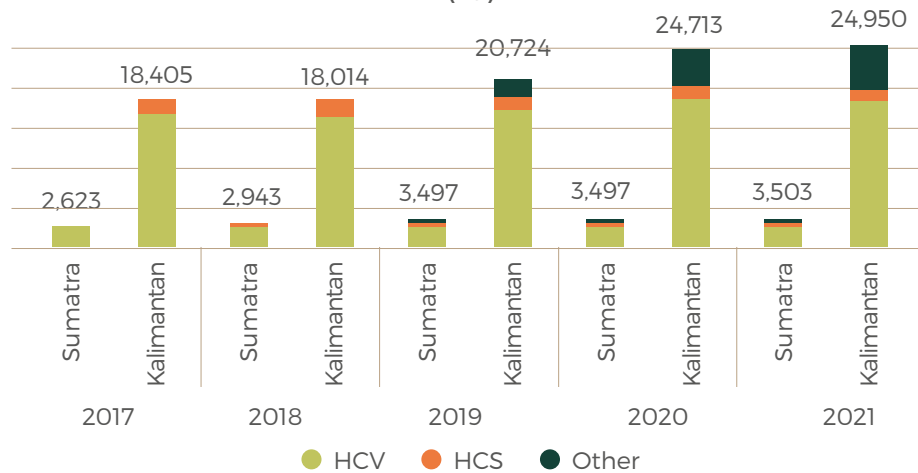
Musim Mas adheres to relevant RSPO requirements for new developments and the expansion of plantation areas. We are committed to zero conversion of the natural ecosystems within our operations, particularly in high conservation value (HCV) areas, peatlands, and high carbon stock (HCS) forests.

We initiated HCV assessments for all our operations since 2007 and have maintained all HCV areas. This includes areas subsequently classified as HCS areas. There has been zero deforestation in Musim Mas operations in accordance with our cut-off date of 31 December 2015 as published in our Sustainability Policy.

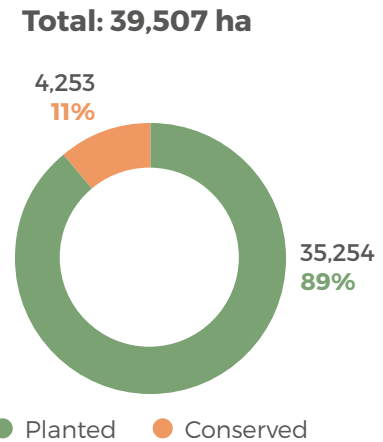
As of December 2021, we manage 28,453 hectares of conservation area. Since 2017, our total conservation area has increased 35% from 21,028 hectares following HCV and High Carbon Stock Approach (HCSA) assessments. About 88% of our total conservation area is in Kalimantan.

These conservation areas are subject to dedicated conservation and management monitoring plans. Our efforts include restoring natural areas which have been degraded, affected by fires or encroached since 31 August 2020. We also adhere to best practices aligned with Roundtable on Sustainable Palm Oil (RSPO) guidelines and legal requirements to manage peatlands and fragile soils and seek out expert advice as needed. A crucial part of our approach is involving surrounding communities in every stage of the development and execution of our conservation management plans. In addition, our conservation teams regularly conduct biodiversity surveys, ground patrols, and satellite monitoring for encroachment to prevent illegal development and hunting.

Conservation area by region 2017-2021 (ha)



Managed peat area planted and conserved 2021 (ha, %)



Notes:

- 1 Overlaps in HCV and HCS areas are reflected as HCV figures.
- 2 'Other' includes steep areas, wildlife corridors, and riparian buffer zones not identified by HCV and HCSA assessments.
- 3 2018 and 2019 data has been updated by rounding up.



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Conservation initiatives and programs



Assessing our conservation impacts over the last decade

Over the years, Musim Mas has launched dozens of conservation initiatives at our plantations, capturing and collecting vast quantities of data. This repository of information provides an opportunity to review and assess years of data to understand how our conservation efforts impact and benefit biodiversity and identify gaps. Our biodiversity dataset is our most comprehensive and most valuable informational asset.

In 2021, we partnered with the South East Asia Rainforest Research Partnership (SEARRP), a Borneo-based scientific research facility established by the Royal Society in 1985. SEARRP facilitates world-class scientific research that addresses major environmental issues, with expertise in habitat restoration and sustainable plantation management. As part of this program, SEARRP has received access to our extensive historical monitoring data, namely data collated from monthly surveys from each unit of operation across Indonesia of up to 14 years. The experts are conducting an **independent assessment to determine the effectiveness of our HCV monitoring efforts and develop a biodiversity baseline for our HCV areas. Based on the findings, SEARRP will support the recalibration of our conservation efforts to increase their efficacy.**

By performing these statistical analyses, SEARRP and Musim Mas can better understand trends and determine if biodiversity is increasing in response to our conservation initiatives. Ultimately, this research will support our efforts in setting measurable objectives to avoid species loss and improve biodiversity at our plantations.

More importantly, SEARRP research will provide evidence and a scientific foundation for monitoring in the palm oil industry's conservation efforts. We hope that the palm oil sector as a whole will embrace these insights, leading to an industry-wide monitoring protocol.

While the partnership agreement was signed off on in 2020, we faced delays due to the pandemic. As of July 2022, the final report has been issued and shared with Musim Mas. This will be followed by a training workshop for Musim Mas employees.

Commentary by **Glen Reynolds**, Director | South East Asia Rainforest Research Partnership (SEARRP)

As an RSPO-certified company, Musim Mas has identified and set aside the required HCV areas and implemented monitoring measures. Impressively, for a plantation company, they began implementing HCV-linked recommendations from SEARRP's scientific programs (which were previously presented to the RSPO Biodiversity and High Conservation Values Working Group) before our engagement. These recommendations are specifically aimed at improving biodiversity in plantation landscapes.

The logical extension of these efforts is implementing a robust monitoring and assessment program to understand whether these 'enhanced' HCV approaches have yielded the expected biodiversity impacts and benefits. This is why we entered into a one-year partnership with Musim Mas.

This project is a unique opportunity for SEARRP and our research scientists; we have access to Musim Mas' comprehensive dataset comprising up to 10 years' worth of the company's biodiversity and monitoring programs. This data has been generated across multiple research plots from Musim Mas' HCV areas in Sumatra and Kalimantan and measures several crucial parameters, including comprehensive information on bird diversity.

Ideally, our next step would be conducting experiments that shed further light on managing biodiversity in a production landscape. It would be fascinating to test what additional interventions can most effectively improve biodiversity.

Conservation and sustainability projects need more examples of best practice. SEARRP is keen to work with Musim Mas and other plantation companies to leverage the enormous quantity of data collected for certification and find new ways to analyze and use existing and future data to directly inform management and conservation best practices. The program has the potential to influence future policies and procedures and serve as the basis of a reliable case study for all RSPO members.

About: SEARRP facilitates world-class scientific research addressing the tropics' major environmental issues: plantation development, habitat restoration, and climate change. SEARRP is based in Sabah's Danum Valley, works with international universities and local partners to facilitate research by individual scientists, and manages a suite of large-scale field experiments. Since Q2 2021, the SEARRP team has worked with senior Musim Mas teams in Singapore and Medan on this conservation assessment.



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Piloting HCSA community land use planning at an existing plantation

Community land use planning is crucial to new development projects, as most lands under consideration for palm oil production are inhabited by people with existing rights and livelihoods. Before we proceed with any new development, Musim Mas carries out a High Carbon Stock Approach (HCSA) assessment covering 14 Social Requirements (SRs) we must respect. This approach is used during the planning, review, and preparation phases, including negotiations, to address the potential impact of our operations on the affected lands and communities. HCSA assessments also play an essential part in our conservation planning and practices, including our efforts to respect local communities' customary rights.

The HCSA initially applied to land slated for new plantation development. However, it has since been expanded to include new development on existing plantation holdings. HCSA SR 13 was specifically developed to guide the application of the other Social Requirements when applying the HCSA to existing operations. Musim Mas is trialling HCSA SR 13 at a Central Kalimantan plantation to determine how we can adapt it to our other existing plantations.

There are two phases to the pilot study.

Phase 1 was a desktop study conducted from May to September 2021 by independent consultant Helen Newing. She reviewed Musim Mas' social compliance to create a framework based on HCSA SR 13 that will guide future document reviews.

Phase 2 will be a field study to verify and validate Musim Mas' implementation of HCSA SR 13 in partnership with Forest Peoples Programme (FPP), an NGO with expertise in land rights, the environment, development, and indigenous affairs. This field study includes consulting impacted communities and the relevant Musim Mas

personnel on the company's implementation of Free, Prior and Informed Consent (FPIC). Once this exercise is completed, FPP and the Musim Mas assessment team will submit their findings as an interim report to be approved by the affected communities before drafting a final report.

Commentary by **Patrick Anderson**, Policy Advisor | Forest Peoples Programme (FPP)

For many rural communities in the tropics, lack of control over their land is a serious problem. Under RSPO and HCSA rules, companies must recognize and respect rural communities as landowners. To fulfill their conservation commitments under these standards, companies must find ways to incentivize communities overlapping with their concessions or supply areas. Companies can further support communities by providing job opportunities to residents and hiring community representatives to work on conservation management, social programs, etc. These incentives can encourage communities to participate in conservation.

As an RSPO member, Musim Mas must carry out due diligence to ensure their suppliers comply with No Exploitation requirements. Many smallholders and communities are unaware of the commitments of companies operating on or purchasing from their lands. Companies like Musim Mas must communicate these commitments and requirements and help their suppliers to meet them. Due diligence is an integral part of this process and should include an independent verification and access to a grievance mechanism. FPP is pleased to be able to work closely with Musim Mas on the application of the HCSA social requirements to existing operations.

About: Patrick has collaborated with Musim Mas for almost a decade through the RSPO, POIG and multi-stakeholder HCSA initiatives. At the time of this report's publication, FPP and Musim Mas are jointly trialling HCSA Social Requirement 13 at Musim Mas' PT Unggul Lestari concession in Kalimantan.



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- Water management
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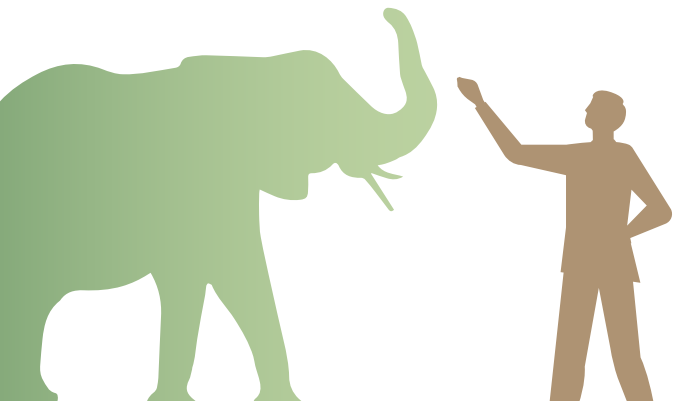
Pillar 2: Deliver Positive Environmental Impacts



Collaborating with Tesso Nilo National Park Foundation to reduce human-elephant conflict

Since 2006, Musim Mas has partnered with the Tesso Nilo National Park Foundation to mitigate human-elephant conflicts in the Tesso Nilo landscape in Pelalawan, Riau. The habitats of Sumatran elephants in the region have been under threat for the last 20 years due to historical development by agriculture companies in Riau and encroachment of national parks. Elephants are attracted to planted crops and enter farms and plantations. This leads to conflicts between elephants and humans, sometimes resulting in the death of some elephants.

The 12-year collaboration has improved the capacity of the 'Flying Squad' to engage the local community on the vulnerability of elephants and the importance of elephant-human coexistence. The role of the 'Flying Squad' is to intervene and de-escalate any conflict between farmers and elephants, and to support conservation efforts that increase the elephant population in Riau.



In 2021, we renewed the partnership for an additional three years. A portion of Musim Mas' funding will be used to purchase new technologies for the project, including drones, Global Positioning System (GPS) elephant collars, and satellite tracking systems to support monitoring efforts. The program is a key stakeholder supporting the Riau government's conservation vision. Musim Mas also works closely with the Nature Conservation Agency of Indonesia (*Balai Konservasi Sumber Daya Alam* (BKSDA)). We have also partnered with local stakeholders, including communities, to develop a Conservation Strategy and Action Plan (SRAK), which will serve as a regional guideline on elephant management.

» [IUCN Red List of Threatened Species identified at our operations](#)



Supporting the Medan Zoo

Establishments like the Medan Zoo have particularly been affected by the pandemic. Without visitors for long periods of time to generate the income, funds to support feed the zoo animals and maintain zoo facilities have been at jeopardy. From August 2021 to January 2022, Musim Mas provided financial assistance to help the Medan Zoo cover animal feed, veterinary, and operational expenses.

Achieving a deforestation-free supply chain through traceability

To ensure our supply chain is free from deforestation, we make significant efforts to track and trace all FFB we source to the place of production and engage with suppliers on our No Deforestation and No Peat commitments.

» [See more under Supply chain](#)

RESPONSE TO GREENPEACE REPORT

In October 2021, Greenpeace Indonesia released a report on oil palm companies with plantations located within the country's national forest domain. This report alleged that Musim Mas plantations are situated within the forest domain, breaching national forestry laws.

Musim Mas has been compliant with Indonesian Government regulations, including seeking the appropriate licenses for our plantations and investigating and addressing discrepancies through the appropriate mechanisms. We made this clear in our formal joint response with other growers.

This is a long-standing and complex issue, and there are often questions concerning the overlap of plantation licenses and designated forest estates. However, we recognize that the Indonesian Government is investigating and rectifying these overlaps and are looking forward to a swift resolution of such cases. In the meantime, we will continue to engage in constructive multi-stakeholder discussions to tackle collective challenges and work towards the common goal of a deforestation-free industry.



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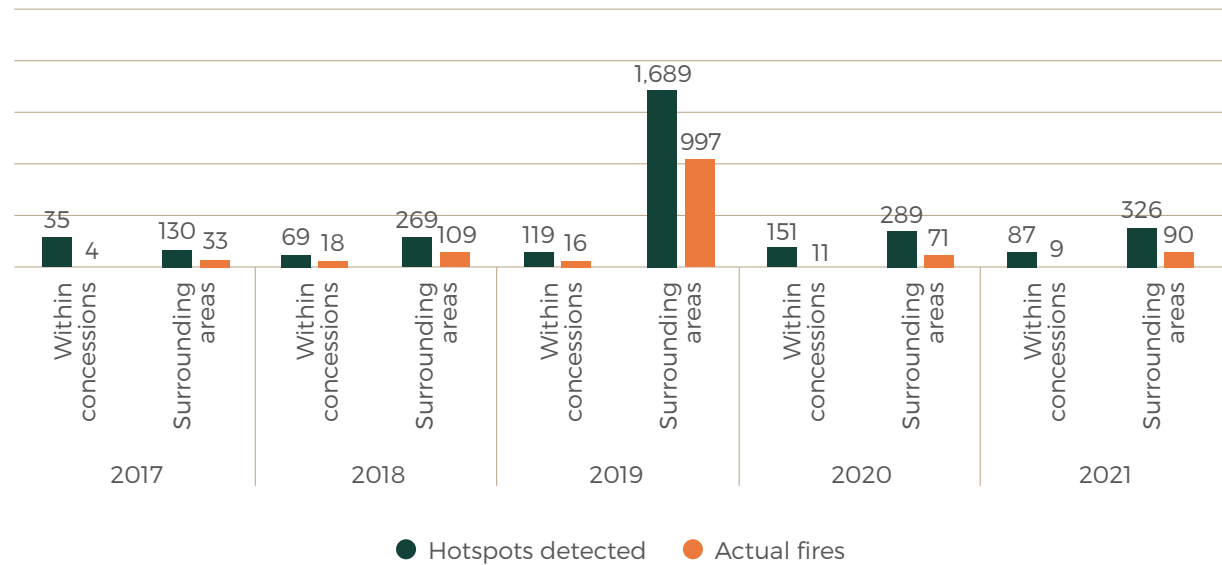
Pillar 2: Deliver Positive Environmental Impacts

MONITORING AND MANAGING FIRES

[GRI 3-3]

Musim Mas strictly prohibits the use of fire within our operations and those of our suppliers. We continuously track and monitor hotspots within our estates and their surroundings and invest in training firefighters to take action at the first sign of an outbreak. We monitor our concessions and surrounding areas for hotspots using satellite surveillance. The year 2021 saw lower average rainfall compared to 2020. Our monitoring systems identified 87 hotspots within our concessions, which took place during dry season. Of these, only nine turned out to be fires, affecting approximately ten hectares of unplanted area in Kalimantan. We detected 326 hotspots in areas surrounding our estates and concessions, 90 of which were confirmed to be fires, affecting 577 hectares.

Hotspot vs. fires within concessions and surrounding areas 2017-2021 (no.)



Note: the 2019 spike in fires in areas surrounding estates was due to high temperatures resulting in severe forest fire outbreaks in Indonesia that year.

Despite our best efforts, local community members still use fire in customary slash-and-burn land clearing. To combat the practice, Musim Mas engages with and supports local communities through our Fire Free Village Program (FFVP) – or *Masyarakat Bebas Api*. This program aims to educate communities on fire risks and helps them adopt new land clearing practices to transition away from fire use. As part of this initiative, we raise awareness, provide agricultural equipment, and incentivize communities that remain fire-free with infrastructure improvements and services. **The FFVP program covers 74 villages spanning more than 450,000 hectares. Despite COVID-19 restrictions, we conducted 161 training sessions in 2021, 17 more than in 2020. A total of 42 villages was also rewarded for remaining fire-free, ten more than the previous year.**





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CHEMICALS AND PESTICIDES

[GRI 3-3]



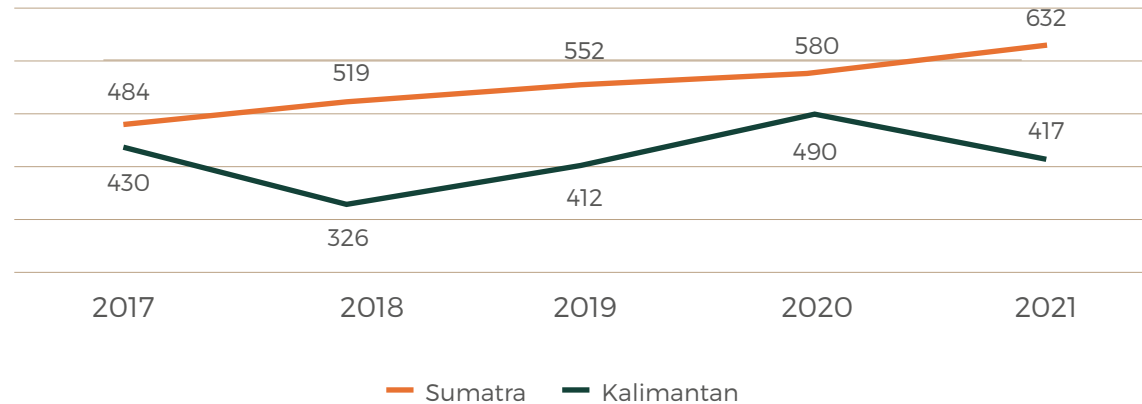
We continuously strive to reduce our reliance on chemical fertilizers and pesticides at our plantations by optimizing their use and replacing them with organic substitutes where possible. This is achieved by implementing an integrated pest management (IPM) strategy, such as encouraging the growth of barn owl population to manage rats, which are common pests in estates, backed by extensive long-term research and development (R&D) efforts.

We apply fertilizers following agronomic recommendations based on soil and leaf analyses. This approach minimizes waste and ineffective fertilizer application. We also apply boiler ash from our mills in peatland areas to maintain pH levels and use dried decanter solid in place of potassium on sandy soil to increase moisture retention. This helps to improve the physical and chemical properties of marginal soils. Read more about how we re-use waste [here](#).

Tracking inorganic fertilizer use at our operations is critical to our chemical reduction efforts. In 2021, our inorganic fertilizer use amounted to 1.54 and 2.28 tonnes per mature hectare (MT/ha) in Sumatra and Kalimantan, respectively.

We also track and monitor the toxicity levels of pesticides used at our estates, and have maintained current levels in line with palm oil industry best practices.

Toxicity rates by region 2017-2021
(toxicity units/ha)



Note: in 2021, LD50 rates were reclassified to reflect the most current regulations. 2020 figures have been restated due to rounding adjustments.





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Pesticide phase-out plan

In 2018, we issued a pesticide phase-out plan for ten pesticides after an independent review of their use at one of our Riau plantations against Palm Oil Innovation Group (POIG) requirements. We work to achieve our milestones year-on-year, and successfully phased out six pesticides as of December 2020.

The remaining pesticides were planned for phase out by December 2021, however we are facing delays and efforts are still ongoing to phase them out. We identified and trialed an alternative to Chlorpyrifos (an insecticide) called Hexaflumuron from 2018 to 2021. However, its large-scale commercial application requires extensive employee training, especially on identifying harmful and beneficial termites to administer the correct dose and only bait harmful insects. Training requires being in the field, and was therefore delayed due to the pandemic.

As for phasing out Coumatetralyl and Warfarin, the identified rodenticide alternatives will only be available on the Indonesian market for commercial application in 2022.

In September 2021, Musim Mas was granted a one-year extension to phase out these pesticides by December 2022.

There is currently no alternative to insecticide Carbosulfan, but Musim Mas only uses it for emergencies, conditional on POIG approval before its application. There has only been one such emergency application at one estate in 2019 following a severe red-striped weevil outbreak.

Active ingredient	Type	Expected phase-out date	Status
Brodifacoum	Rodenticide	Dec 2018	Achieved on target
Permethrin	Insecticide	Dec 2018	Achieved on target
Benomyl	Fungicide	Dec 2019	Achieved on target
Glufosinate-ammonium	Herbicide	Dec 2019	Achieved on target
Cypermethrin	Insecticide	Dec 2020	Achieved on target
Mancozeb	Fungicide	Dec 2020	Achieved on target
Carbosulfan	Insecticide	Until an alternative is available, Carbosulfan is authorized for emergency use, subject to POIG approval.	
Chlorpyrifos	Insecticide	Dec 2021	
Coumatetralyl	Rodenticide	Dec 2021	1-year extension approved by POIG
Warfarin	Rodenticide	Dec 2021	



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WATER MANAGEMENT

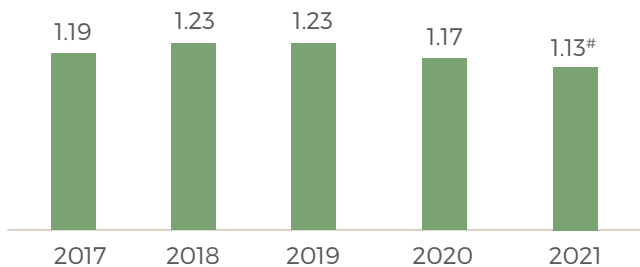
[GRI 3-3, GRI 303-1, 303-2, 303-5]
[SASB FB-AG-140a.1, FB-AG-140a.2, FB-AG-140a.3]



We recognize that water is a finite resource. Musim Mas has adopted comprehensive measures to preserve the availability and quality of surface water and groundwater for our business and surrounding communities.

We draw surface water and groundwater for our upstream operations for industrial uses, like steam generation, pesticide-mixing, seedling irrigation, and domestic uses, such as cleaning and cooking. **In 2021, our mill water usage intensity for RSPO-certified mills was the lowest since we began reporting it, at 1.13 cubic meters per tonne of FFB processed* (m³/MT FFB).** This was a 3.4% reduction compared to 2020 levels. We continue to meet our annual target of maintaining water usage intensity at a maximum of 1.2 m³/MT FFB or below.

Average mill water usage intensity 2017-2021
(m³/MT FFB)
RSPO-certified mills

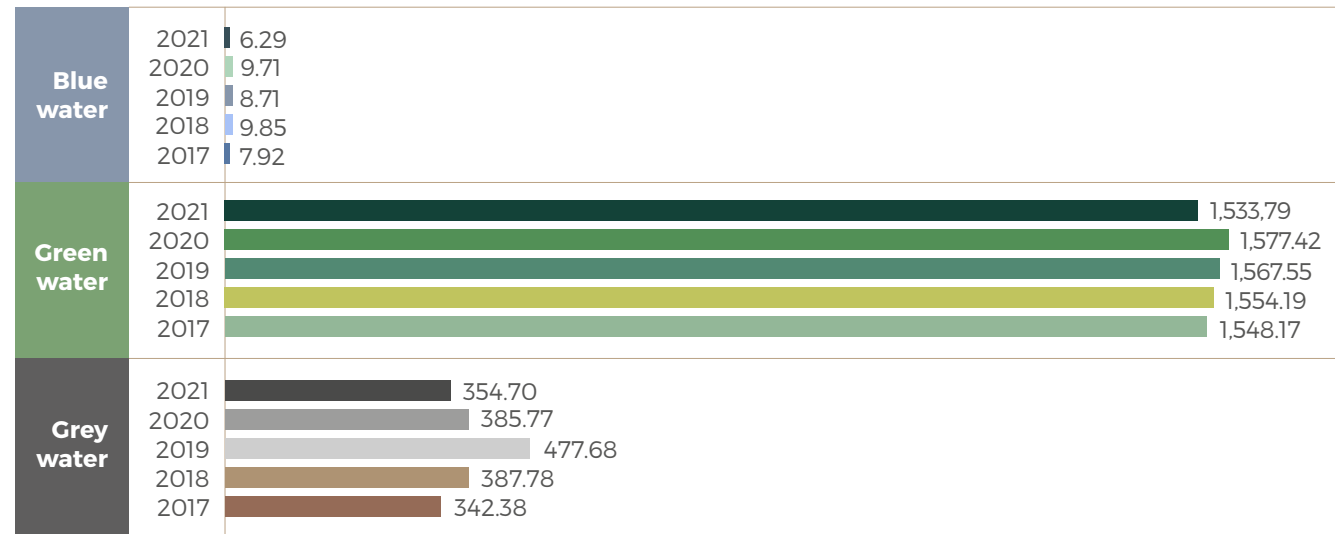


EY has performed limited assurance procedures on these figures.

Musim Mas is one of the few palm oil companies that employ the Water Footprint Methodology to calculate our annual water footprint and assess water risks. This approach measures the amount of rainfall our plantations receive and our total water consumption to calculate our water balance. We have maintained a positive water balance since 2016.

We continue to gather year-on-year data to build and understand our baseline. We also set water management plans for our upstream operations as outlined in the POIG Charter for water accountability.

Water footprint 2017-2021
(million m³)
Upstream operations



Note: blue water is fresh surface water or groundwater, green water is rainwater, and grey water is the amount of water used to dilute pollutants. Source: [Water Footprint Network](#). Data is derived from operational parameters, including planted area, concentrations of fertilizers, herbicides and pesticides, and measured water consumption.

We recognize our factories and refineries are also water intensive. We will report on our water use and initiatives at these facilities in future reports.



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WASTE MANAGEMENT

[GRI 3-3, 306-1, 306-2, 306-4]



We identify and categorize all waste our operations produce as liquid, solid, or gas and handle it according to our standard operating procedures (SOPs). We have implemented appropriate waste management procedures for all hazardous and domestic waste and mitigation and prevention measures to reduce the risk of environmental pollution. We regularly educate workers on waste handling and segregation.

Musim Mas is proud to operate zero-waste mills, which means we reclaim 100% of the non-hazardous waste we produce and recycle it back into our processes. Empty fruit bunches (EFB) are mulched and applied back at our plantations as fertilizer. At our mills, we recover energy from palm kernel shells (PKS) and palm fiber by using them to fuel our boilers. In addition, our methane capture facilities harness methane from POME to generate electricity that powers our mills, estates, and workers' housing. Any surplus electricity we generate is exported to the national grid.

At our plantations, we use organic fertilizer from several sources of waste, namely: dried decanter solids (DDS) and boiler ash from our mills and treated palm oil mill effluent (POME). Old oil palm trunks during replanting and cut oil palm fronds from pruning are also left in the plantations as organic fertilizer.

Organic waste re-used at upstream operations 2021

Organic fertilizer	Amount used
EFB	20,319 MT
POME	2,103,680 m ³
DDS	45,956 MT
Boiler ash	25,123 MT

We take every necessary precaution to ensure minimal wastage and crop loss during harvesting, transportation, and processing. Fresh fruit bunches (FFB) are harvested at its optimum ripeness, i.e., when fruitlets start detaching from the FFB. We do this to prevent harvesting overripe and underripe fruit bunches. All detached fruitlets are collected as they contain high amounts of oil. This practice also minimizes wastage. We schedule FFB truck deliveries so that all harvested fruit arrives at our mills within 24 hours to ensure freshness and minimize bruising, which can contribute to the creation of free-fatty acids that negatively impact CPO yield and quality.

We will report on our waste data and reduction initiatives for midstream and downstream operations in future reports.

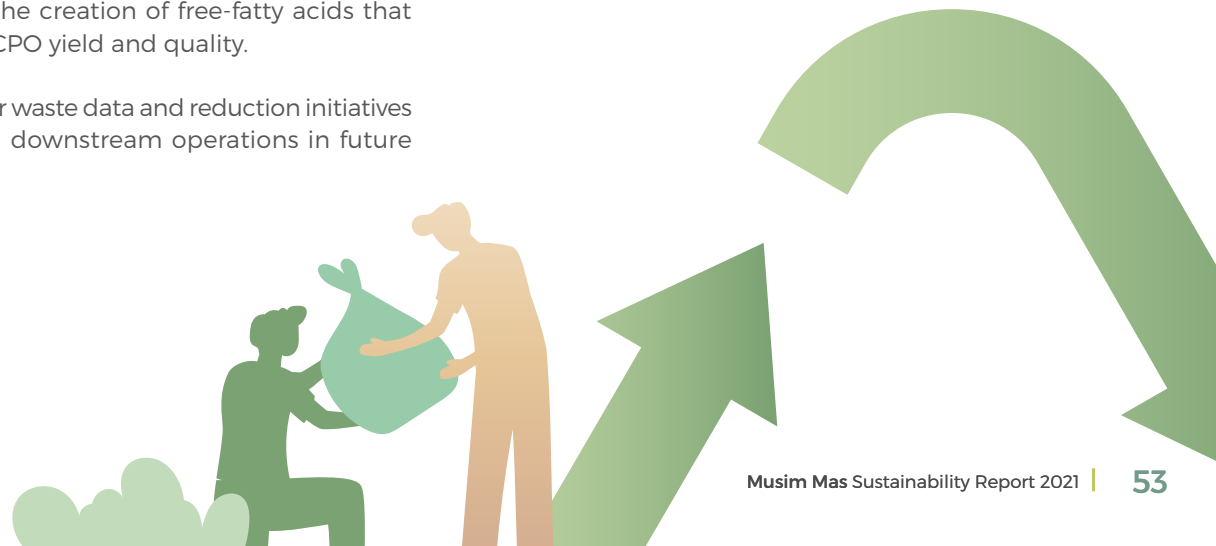
Treating effluent

We treat all palm oil mill effluent (POME) and palm oil refinery effluent (PORE) before discharging them. We strictly manage oxygen demand (BOD) and chemical oxygen demand (COD) levels and keep them below regulatory thresholds to avoid impacting groundwater and nearby water sources. This was achieved in 2021.

At our upstream operations, there were no instances of non-compliance with water quantity or quality permits, standards, and regulations in 2021.

At our plantations, we also monitor phosphorus and nitrogen levels in watercourses at inlet and outlet points situated upstream and downstream of rivers that cross our concessions.

- » [Approaches to POME and PORE treatment](#)
- » [See 2021 Sustainability Performance Data for upstream BOD and COD figures](#)





- The Musim Mas supply chain
- Stakeholder collaboration
- Grievances
- Product quality and safety

03

Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders





- The Musim Mas supply chain
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Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

We believe that collaborating with partners and peers is the only way the industry can effect meaningful change and tackle common challenges such as deforestation and labour concerns within and beyond our supply chain. This requires working closely with our suppliers on No Deforestation, No Peat, No Exploitation (NDPE) commitments and with the private and public sectors to drive needed change. Given our reach and focus on sustainability over the years, Musim Mas sees it as our responsibility to anticipate challenges and opportunities by leading multi-stakeholder dialogues and bringing key partners together.

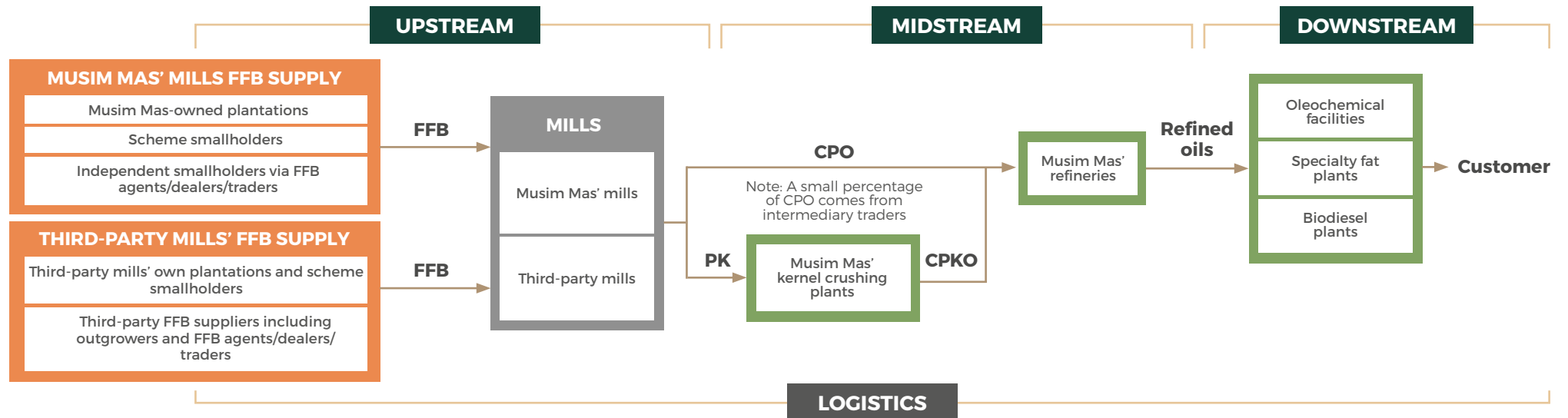
In 2019, Musim Mas developed a dedicated NDPE Roadmap with clear targets supporting our suppliers in meeting our NDPE commitments. It was designed to meet stakeholder needs at the time, but we have grown and adapted our approach based on lessons learned through supplier engagement. We have also applied new monitoring protocols and datasets to support our plans to meet these targets. In 2022, we will update our NDPE Roadmap to reflect the situation on the ground and evolving stakeholder expectations. This revision will incorporate the latest developments from our updated 2020 Sustainability Policy, landscape strategies, and 2021 NDP Risk Management Framework.

» [See latest updates](#)

THE MUSIM MAS SUPPLY CHAIN

[GRI 2-6, 3-3, 204-1]

Overview





- The Musim Mas supply chain
- Stakeholder collaboration
- Grievances
- Product quality and safety

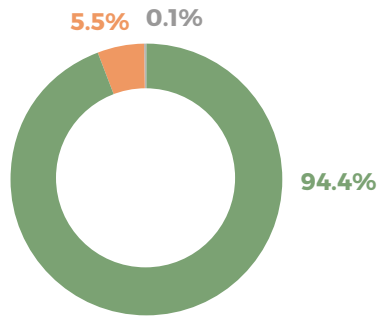
Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

Over 94% of Musim Mas' crude palm oil (CPO) supply originates from Indonesia, where we actively maintain supplier engagement and landscape initiatives. Another 5.5% comes from Malaysia, while less than 0.1% is from Thailand.

We sourced CPO from 553 suppliers in 2021. Of total CPO volumes sourced, 85.6% comes directly from third-party supplying mills, 13.1% is from Musim Mas-owned mills, and 1.3% is indirectly sourced from intermediary traders. Of our 553 CPO suppliers, 535 are external CPO supplying mills and 18 are Musim Mas-owned mills.

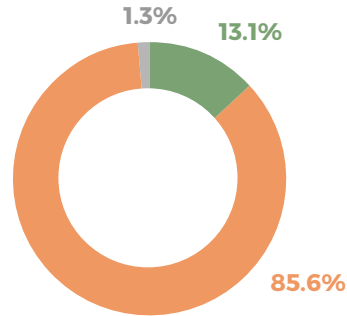
Of these 535 external CPO suppliers, 84 source from their own plantations only, while 451 source from their own plantations, external fresh fruit bunch (FFB) sources, or both. Of our total external supply of CPO volume, 56.1% of the FFB processed at these third-party mills originates directly from their own plantations, while 43.9% is sourced from external FFB suppliers.

CPO supply base by country 2021
(% of total volume)



- Indonesia
- Malaysia
- Thailand

CPO supply base by source 2021
(% of total volume)



- Musim Mas mills
- Supplier mills
- Intermediary traders

Third-party volumes sourced by FFB origin 2021
(% of total volume)



- Own plantations
- External FFB suppliers



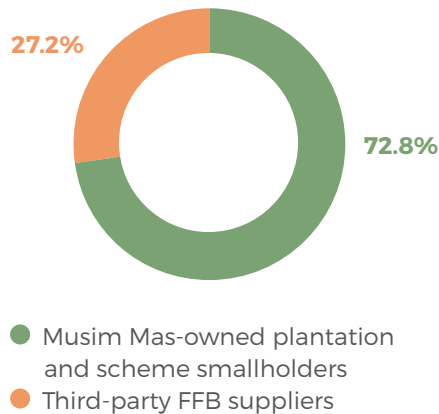


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Of the 18 Musim Mas-owned mills, ten mills source FFB only from our own plantations and scheme smallholders, while five mills source from both our own plantations and third-party FFB suppliers. The remaining three of our mills are independent and only source external FFB. Overall, most of the FFB is sourced from Musim Mas-owned plantations and scheme smallholders, accounting for 72.8% of the total FFB volumes sourced in 2021. The remaining 27.2% came from third-party FFB suppliers.

Musim Mas volumes sourced by FFB origin 2021
(% of total volume)



We have also identified 14,457# independent smallholders who are part of our third-party FFB supply base. These independent smallholders supply to us primarily through FFB agents or traders. As of 2021, we have trained 2,713# of these independent smallholders through direct training program ([Training for Smallholders](#)).

Commentary by **Avinash Nandanwar**, Head Sourcing | Galaxy Surfactants Ltd.

Musim Mas is one of the leaders driving the implementation of NDPE policies. The company has a comprehensive NDPE framework in place and implements it in line with its other policies, e.g., on smallholder development and deforestation. I rate Musim Mas among the top companies progressing on sustainability.

Tracing palm oil to plantation is straightforward, but traceability for palm kernel oil (PKO) needs more work. The PKO value chain is more complicated because PKO changes hands multiple times. The industry must therefore work jointly to develop a framework for PKO traceability.

India is a highly price-sensitive market and the world's biggest importer of palm oil. While awareness of sustainability in the country is improving, more work is needed. Demand for PKO derivatives far outstrips supply, and certified PKO premium levels have risen significantly in the last year, a matter of grave concern. This price increase poses a risk to the palm oil value chain as it will slow the consumption of sustainable

products and cause buyers and consumers to switch to alternative sources. Sustainable PKO and derivative pricing must be more competitive to not become a barrier to sustainable product uptake.

About: Avinash heads Galaxy's global sourcing portfolio and is responsible for procuring feedstock, raw material, packing material, and other chemicals across different territories. Musim Mas has been a strategic Galaxy partner for nearly a decade and a major supplier of oleochemicals during a period of growth for both companies.



EY has performed limited assurance procedures on these figures.



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Traceability



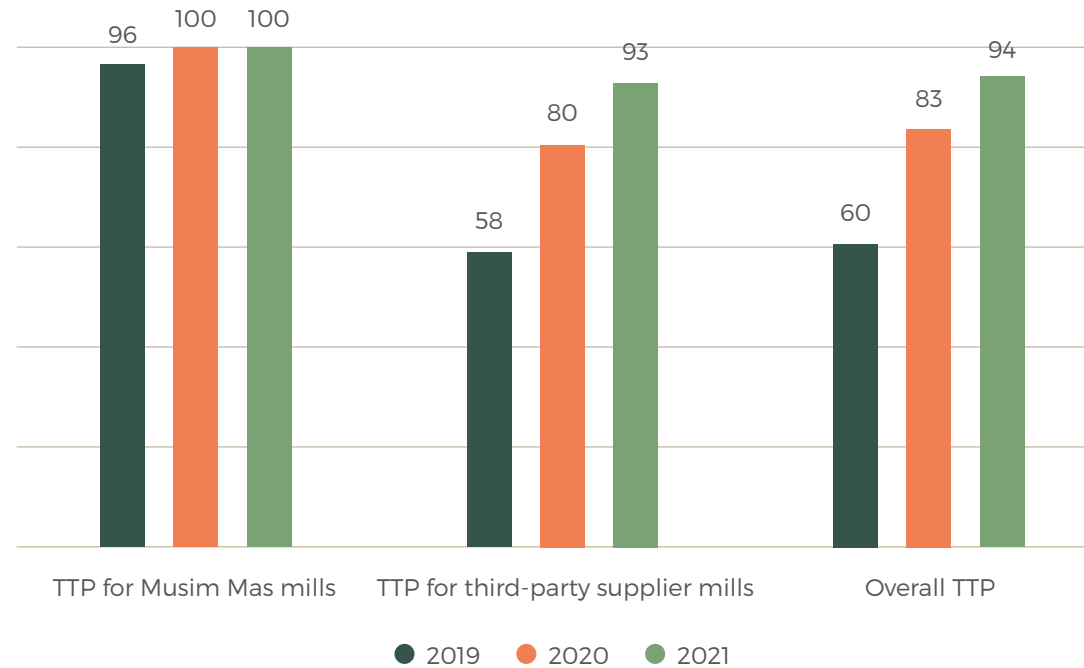
To address deforestation and peat development risks, we need detailed knowledge of the supply sheds of all mills we source from. Having achieved 100% traceability to mill (TTM) since 2015⁹, we continue to focus on achieving 100% traceability to plantation (TTP) or place of production for all CPO and palm kernel (PK) sourced. For an overview of our traceability approaches, see our [website](#).

Since 2020, we have achieved 100% TTP for the FFB supply base of Musim Mas mills. To achieve full TTP for the rest of our supply chain, we are working on TTP for third-party supplier mills. We have made tremendous inroads, achieving 93% TTP for our third-party mills in 2021 compared to 80% in 2020 and 58% in 2019 – a significant increase in the last two years. **For own operations and third parties combined, we have achieved TTP of 94%¹⁰ as of December 2021, up from 83% in 2020. We are on track to reach 100% by 2025.**

The main obstacle to achieving full TTP is collecting data from FFB dealers and in particular, independent smallholders. This comes down to systemic issues around legal land titles and the accuracy of maps recorded in various systems. Mapping hundreds of thousands of farms is an arduous task that requires considerable resources to collect, verify, and collate information. For this reason, we engage smallholders on a priority basis

and take a risk-based approach to map production areas that overlap with high-risk areas (such as those in the vicinity of protected areas and peat areas). Thus, this process requires a geographic approach where we obtain information on plots of land through direct engagement with individual smallholders to collect their names and exact locations. As a result, full traceability will take time.

Traceability to plantation 2019-2021 (%)



⁹ TTM data has been verified by Control Union. The verification statement can be found [here](#).

¹⁰ TTP data has been verified by Control Union. The verification statement can be found [here](#).



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Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

Assessing, monitoring, and managing risk

[GRI 3-3, 308-2] [SASB FB-AG-430a.3]

While our NDPE Roadmap outlines how we will engage our operations and suppliers on NDPE commitments by 2025, we recognize the need for a better-defined procedure to quantify and mitigate NDPE risks at our independent mills and those of our third-party supplying mills. Our No Deforestation, No Peat (NDP) Risk Management Framework was released in September 2021 and clearly outlines our approaches to risk identification, assessment, mitigation, and monitoring. It was developed to inform, not replace, programs that independently verify compliance with NDPE requirements.

Musim Mas mills that rely entirely on FFB from our own concession areas and scheme smallholders are verified as fully NDPE compliant through Palm Oil Innovation Group (POIG) or Roundtable on Sustainable Palm Oil (RSPO) certification and adherence to High Carbon Stock Approach (HCSA) requirements. However, we also source from third-party mills and knowing the exact composition of their FFB supply sheds is key to assessing the risk of deforestation and peat development. Using TTP data and overlaying supply shed maps with conservation and peat areas, we categorize all the mills in our supply chain as low, medium, or high risk. Our assessment approach was initially piloted at our Aceh sourcing area before being rolled out for all suppliers.

Risk assessment criteria for Musim Mas suppliers

Risk level	Criteria
High risk	Overlaps with over 10% of risk indicators
Medium risk	Overlaps with 2-10% of risk indicators
Low risk	Overlaps under 2% of risk indicators/POIG verified/RSPO Identity Preserved certified

Musim Mas sourced from a total of 576 CPO and palm kernel (PK) suppliers in 2021, and all were assessed against the criteria to determine their risk levels. Of these, we identified that only 0.2%# was high risk. We have collaboratively developed time-bound action plans to mitigate these risks, and have engaged with the high-risk mill identified during the year. We will continue to engage with identified high-risk mills at least annually.# A further 2.6%# was medium risk, while 97.2%# was low risk. We plan to work with medium-risk mills in the future.

From this year onwards, we will annually assess and report on risk levels. By 2025, we will require all mills to develop action plans, irrespective of risk levels.

» NDP Risk Management Framework



EY has performed limited assurance procedures on these figures.



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Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

Deforestation monitoring

We proactively monitor our supply chain to detect and confirm deforestation, development on peat, and fires. Our Geographic Information System (GIS) team uses combination of methods and platforms to monitor landscapes across Indonesia and Malaysia.

Confirmed cases of NDPE violations by existing suppliers trigger our grievance mechanism. We support alert systems and field-checking initiatives that collect landscape-level spatial development information that can guide future expansion and help steer development into legal areas. We augment this work with our outreach programs and landscape initiatives. From January to December 2021, we remotely monitored approximately 9.2 million hectares[#] of our suppliers' concessions in Indonesia, Malaysia and Thailand for deforestation.¹¹

Musim Mas Geographic Information System (GIS) Team



NEW BASELINE ON LAND USE ANALYSIS AT THE RAWA SINGKIL WILDLIFE RESERVE

In 2021, we worked with Satelligence to conduct a baseline land-use analysis of the planted palm oil area around the Rawa Singkil Wildlife Reserve in Aceh Singkil, a priority landscape for Musim Mas. We mapped over 37,000 hectares using datasets derived from high-resolution 7-10 meter/pixel Sentinel-1 and Sentinel-2 radar and Landsat images. Using advanced imaging, we can detect even the smallest smallholder plantations, including plantations that are better managed and more mature. With the help of Radar Alerts for Detecting Deforestation (RADD), we have far more accurate information on land clearance and deforestation activities than was previously possible, enabling Musim Mas to adopt evidence-based strategies and allocate our resources better.

¹¹ The monitoring covers our suppliers' concessions at group level in Indonesia, Malaysia and Thailand.



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Supplier progress on NDPE commitments

[SASB FB-AG-430a.1, FB-AG-430a.2]

Engaging with suppliers on NDPE

Engaging with suppliers to ensure they adopt the standards comprising Musim Mas' NDPE commitments is a priority. As their progress will determine the success of our entire supply chain, we engage with all suppliers on our policy obligations, and we require them to attend NDPE workshops and submit their NDPE commitments. During the COVID-19 pandemic, in-person engagement, including supplier workshops, was hindered. However, conducting virtual workshops in 2021 increased engagement opportunities. Musim Mas even created easily accessible video tutorials on how to fill in the traceability and self-assessment documents.

As of December 2021, 94% of suppliers were engaged through Musim Mas' workshops, up from 76% in 2020 and 51% in 2019.

We also expect suppliers to complete the Musim Mas Self-Assessment Tool (SAT), a self-administered questionnaire developed in line with our sustainability commitments. Suppliers' responses help us identify potential areas of improvement against our policy commitments and develop tailored roadmaps with timebound plans specific to each supplier. These roadmaps provide benchmarks

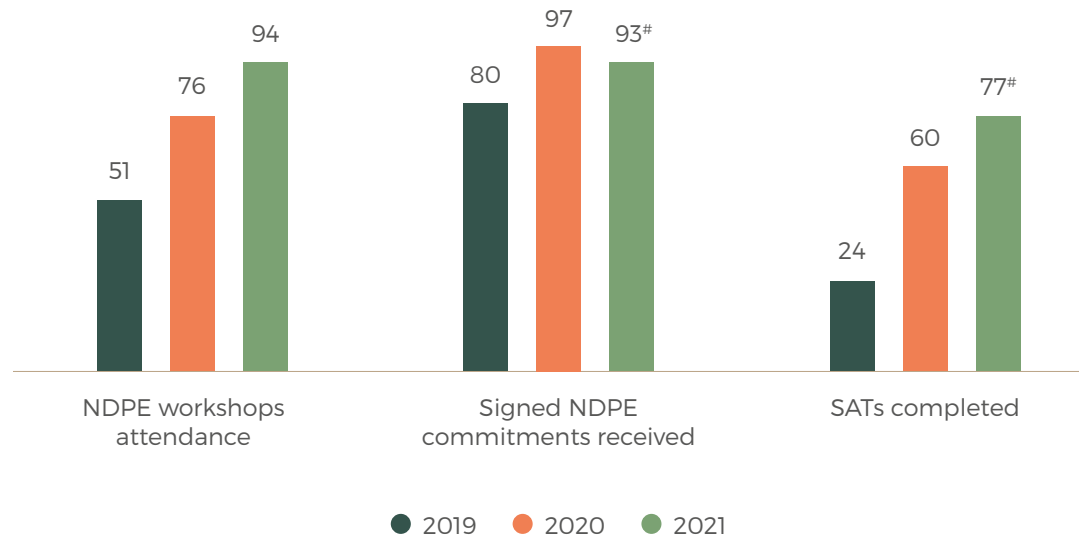
and milestones that demonstrate suppliers' level of compliance and allow us to monitor their progress. **As of December 2021, 77%# of suppliers have completed their SATs, up from 60% in 2020 and 24% in 2019.**

As of December 2021, 93%# of our supplying mills have signed their NDPE commitments with Musim Mas, representing close to 95% of the total volumes we sourced in 2021.

By 2025, we aim to engage with 100% of our suppliers on NDPE requirements through workshops, obtaining NDPE commitments and completing the SATs.

To support our suppliers in meeting Musim Mas' Sustainability Policy, we carried out additional workshops on high conservation value (HCV), high carbon stock (HCS) and TTP in 2021. In 2022, we will continue on supporting suppliers with other workshops on sustainability topics.

Supplier engagement on NDPE commitments 2019-2021 (%)



EY has performed limited assurance procedures on these figures.



- The Musim Mas supply chain
- Stakeholder collaboration
- Grievances
- Product quality and safety

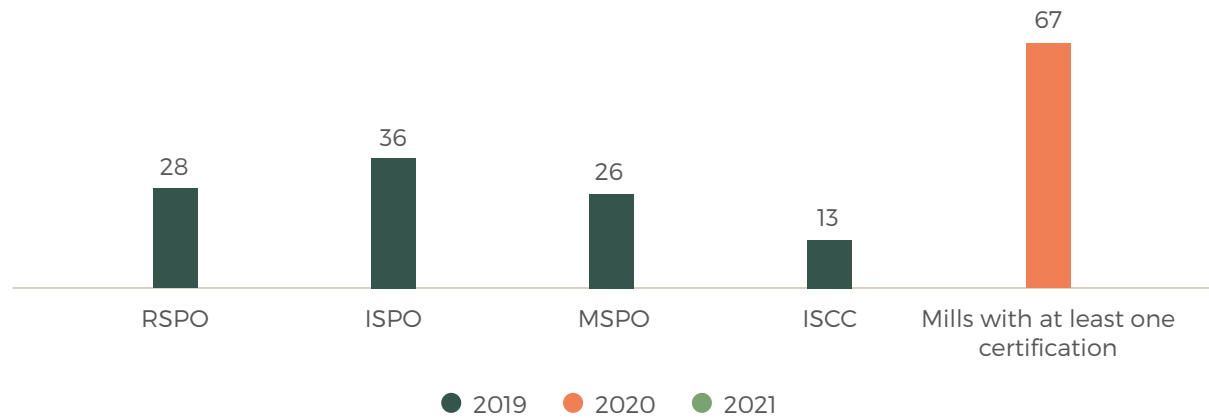
Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

Monitoring NDPE commitments and supplier certification

In addition to tracking suppliers' NDPE commitments, we monitor their adherence to recognized sustainability certification schemes. These include the RSPO, Indonesian Sustainable Palm Oil (ISPO), Malaysian Sustainable Palm Oil (MSPO), and the International Sustainability and Carbon Certification (ISCC) standards. We also track volumes certified against the Palm Oil Innovation Group (POIG) Charter, which currently only originate at Musim Mas-owned mills. Verifying our suppliers' certification status assures us their operations have been audited and verified by third parties, and their commitments have been independently assessed by recognized certification bodies.

Thanks to these efforts, Musim Mas has a clear overview of suppliers that are RSPO, MSPO, ISPO, or ISCC certified and POIG verified (including those with multiple certifications). In 2021, 67% of supplying mills were certified by at least one of these bodies.

Certification status of supplier mills 2021 (% certified)



Based on the number of suppliers who have committed to our NDPE requirements and are certified to at least one certification scheme, we know that approximately 58%# of direct volumes and approximately 5%# of indirect volumes sourced in 2021 are in line with our commitments.



EY has performed limited assurance procedures on these figures.



- The Musim Mas supply chain
- Stakeholder collaboration
- Grievances
- Product quality and safety

Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

NDPE IRF reporting

Since 2019, we have evaluated the progress of each of our supplying mills against our No Deforestation and No Peat commitments via the industry-led NDPE Implementation Reporting Framework (IRF). This reporting tool systematically assesses how far supplying mills have progressed on their NDPE commitments and classifies them into one of six categories.

Musim Mas sees the NDPE IRF as a way for the industry to identify and address the challenges faced by suppliers and avoid using the assessment process to cherry-

pick or 'green-pick' suppliers. Our approach is to work collaboratively to support these suppliers through our supplier engagement programs, landscape initiatives, and Smallholders Hubs. We actively participate in the Production and Protection Beyond Concessions (PPBC) Working Group of the Palm Oil Collaboration Group (POCG) to address some of these issues and work towards the shared goal of a sustained, inclusive transformation of our industry.

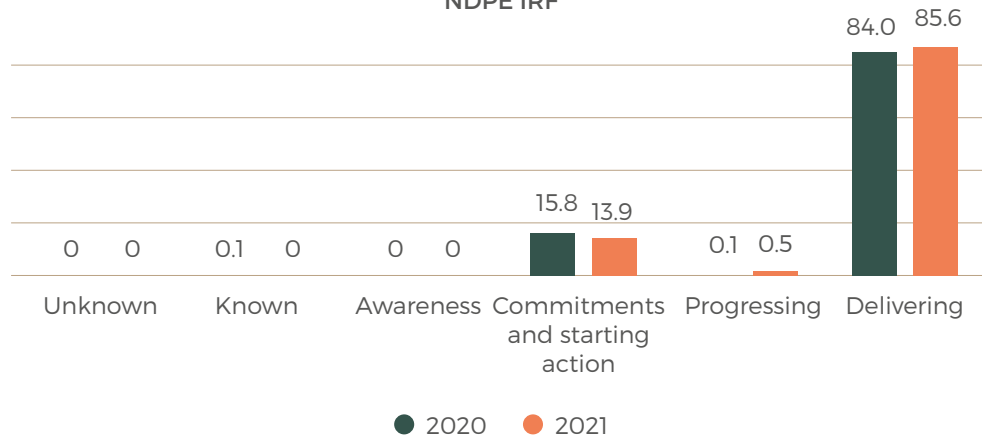
Of the total volumes sourced in 2021, we know that 85.6% of our suppliers are 'delivering' on their No Deforestation

commitments at the production level and 0.5% are 'progressing'. A further 13.9% have 'made commitments and are starting action', which means they are developing action plans, logging grievances and may have begun implementing processes to certify their volumes.

We also know that 75% of our suppliers are 'delivering' on their No Peat commitments, 24% have 'made commitments and have begun taking action', and 1% are 'progressing' towards meeting them.

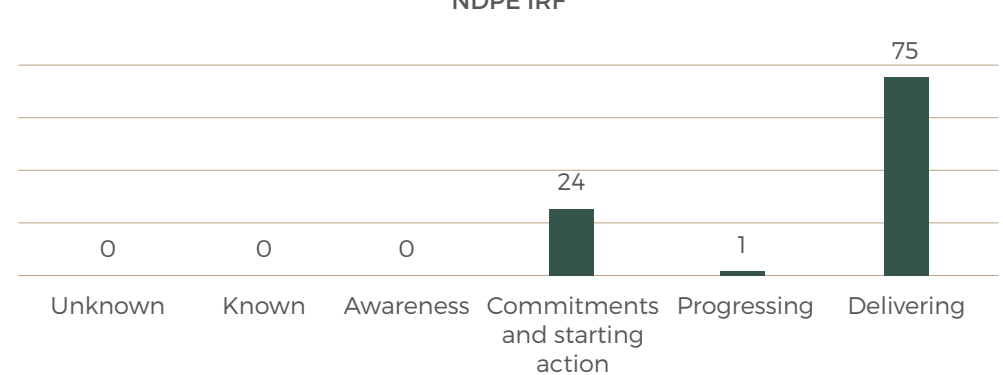
Deforestation progress at the production level 2020-2021

(%)
NDPE IRF



Peat progress at the production level 2021

(%)
NDPE IRF



In July 2021, Control Union independently verified our NDPE IRF reporting for the period of January to December 2021. This means data from 576 mills supplying to 20 Musim Mas refineries and kernel crushing plants in Indonesia, Malaysia and India has been verified externally. The verification statement can be found [here](#).



- The Musim Mas supply chain
- Stakeholder collaboration
- Grievances
- Product quality and safety

Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders



Transforming landscapes

Focusing on mills contributing to our supply base plays an essential part of our strategy, but it is not enough to effect lasting change in our sector. We must integrate smallholders, communities, suppliers, and geographic regions into our approaches to have a tangible, long-term impact. To achieve this goal, we must collaborate closely with other oil palm processors, downstream actors in consumer markets, civil society entities, and governments, especially at the local level.

We have identified four provinces in Indonesia as priority landscapes based on our sourcing areas, the volumes of palm oil sourced, and the importance of NDPE risks to these landscapes and ecosystems: Aceh, Riau, South Sumatra, and West Kalimantan.

We are pursuing tailored programs in these priority landscapes to engage mills and smallholders with the support of local governments, various implementation partners, and peer collaborators. The first, in Aceh, was launched in 2020 and outlines our three main objectives: Engagement, Assurance, and Monitoring and Response. We publish annual updates on our progress in Aceh, which are available [here](#).

Musim Mas is a founding member company of the Siak-Pelalawan Landscape Program based in Riau. In 2021, the coalition launched a [dedicated website](#) about its work.

Integral to our landscape approach is establishing and supporting Smallholders Hubs, a train-the-trainer approach to supporting independent smallholders. As of February 2022, these Hubs are present in six locations: Aceh Tamiang, Aceh Singkil, Riau-Siak, Subulussalam, Sungai Linau (Riau) and Sambas.



» Landscape approach



- The Musim Mas supply chain
- Stakeholder collaboration
- Grievances
- Product quality and safety

Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

Addressing no exploitation in supply chains

[GRI 3-3, 414-2] [SASB FB-AG-430a.2, FB-AG-430a.3]

Although No Exploitation is a crucial element of our NDPE commitments, we currently have no tool to systematically address it in our supply chain. However, as part of our due diligence, we publicly assess suppliers on land conflicts and other exploitation-related grievances. We also require them to self-report on potential social risks as part of Musim Mas' Self-Assessment Tool.

New Human Rights Due Diligence (HRDD) strategy

In 2021, Musim Mas engaged Verité to develop and test tools that assess the human and labour rights component of the 'No Exploitation' pillar of our NDPE policy. The objective of this initiative is to support the development of a robust monitoring system following a review of our current due-diligence procedures and supplier-monitoring systems relating to human and labour rights. Verité reviewed documents and interviewed key management and other relevant people at Musim Mas. In March 2022, Verité carried out baseline assessments of three suppliers and presented a report to Musim Mas in June. Verité will next facilitate a risk mapping and prioritization exercise to segment our suppliers according to their level of risk.

In parallel, the Consortium of Resource Experts (CORE) carried out a high-level mapping exercise surveying the systems and tools Musim Mas has in place to address human rights issues at our operations. It aimed to understand our current human rights policies and procedures and identify potential areas for improvement. Based on the Verité and CORE recommendations, Musim Mas will develop a strategy in 2022 to improve suppliers' adherence to human rights requirements.

STAKEHOLDER COLLABORATION

[GRI 2-28, 2-29, 3-3]

Being at the forefront of sustainability conversations is essential for Musim Mas. We are part of multi-stakeholder partnerships that are industry-, landscape-, and issue-focused. We actively bring stakeholders to the table to discuss and anticipate future challenges and opportunities.



Notable partnerships in 2021

NO DEFORESTATION

- Engaged with South East Asia Rainforest Research Partnership (SEARRP) to assess Musim Mas' conservation impacts over the last ten years
- Partnered with AAK and Nestlé to address deforestation risks in Aceh
- Collaborated with Tesso Nilo National Park Foundation to address human-elephant conflicts in Pelalawan
- Continued monitoring radar alerts as part of Detecting Deforestation (RADD) collaboration
- Partnered with Satelligence to conduct a baseline study of land use and planted oil palm around Rawa Singkil, Aceh
- Partnered with Yayasan Ekosistem Lestari (YEL) on Aceh's first landscape-level HCV-HCSA assessment

NO EXPLOITATION

- Engaged Verité Southeast Asia to assess labour practices at 4 Musim Mas mills and plantations
- Partnered with FPP to pilot HCSA Social Requirement 13 (applying HCSA at existing plantations)
- Engaged Verité Southeast Asia to develop and test systems that assess human and labour rights in our supply chain
- Engaged CORE to map Musim Mas systems and tools that address human rights at our operations

SMALLHOLDERS

- Partnered with UNDP to directly train independent smallholders in Pelalawan
- Collaborated with Livelihoods Fund for Family Farming (L3F) to advance regenerative agriculture in North Sumatra
- Partnered with MUFG and Danamon Banks, and iApps, to launch AgriOn - a new digital finance and financial learning platform for smallholders
- Launched research program with ETHZ and IPB to investigate the conditions under which supply chain sustainability initiatives can lead to reduced deforestation in the Indonesian palm oil sector while ensuring smallholder inclusion

» [Musim Mas' Stakeholder List](#)

» [Partnerships and Collaboration](#)



● The Musim Mas supply chain ● Stakeholder collaboration ● Grievances ● Product quality and safety

Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

Partnering with the financial sector for sustainable financing

Our progress on sustainability and integrating ESG principles into every aspect of our business have helped Musim Mas Group secure sustainability-linked loans. In September 2021, Musim Mas received Green Trade Financing through UOB Bank, Singapore.

Musim Mas also participated in a capacity-building session organized by a group of banks and shared our experience with financial institutions and corporations interested in forming bilateral financial relationships.

Transparency, reporting and evaluation

We maintain an open dialogue with our stakeholders, welcome constructive feedback to improve our operations and strive to be transparent by keeping stakeholders informed on Group-wide matters. Aside from regular reporting and communications on our website, Musim Mas participates in several voluntary and mandatory benchmarking and public assessment programs to evaluate our sustainability commitments and measure our progress, including EcoVadis, CDP, PROPER, Forest500, and Zoological Society of London's Sustainability Policy Transparency Toolkit (ZSL SPOTT).

In 2021, we were assessed by the World Benchmarking Alliance against the [Food and Agriculture Benchmark](#) for the first time. It measures and ranks 350 companies on crucial issues underpinning food systems, including governance, environment, social inclusion, and nutrition. Musim Mas ranked 91st, reflecting our overall efforts and notable leading practices in fertilizer and pesticide use, providing living wages, and protecting land rights. We will look into the areas for improvement highlighted by the assessment.

Commentary by **Lim Chin Hong**, Executive Director, Group Corporate Banking Singapore, Group Wholesale Banking; **Heng Jun Cheng**, First Vice President, Group Corporate Banking Singapore, Group Wholesale Banking; **Ernest Tan**, Head, Agribusiness & Animal Protein, Sector Solutions Group; **Bonar Silalahi**, Deputy Head, Sector Solutions Group | United Overseas Bank Limited (UOB), Singapore

UOB has a comprehensive responsible financing policy covering the palm oil sector. The key to UOB's assessment is working closely with companies to understand their guiding principles and actions. This was the case when we engaged Musim Mas in 2021 to pilot a green trade facility. We worked closely with Musim Mas to structure a financial vehicle focused on sustainable palm oil.

Sustainability is high on Musim Mas' list of priorities, and their policies and initiatives are progressive. Musim Mas proactively engages and updates stakeholders, inviting UOB and other industry players to regular forums and webinars on the progress of their sustainability plans. They also ask for our feedback and engage us in brainstorming sessions on sustainability.

While banks and the financial sector recognize the strides towards sustainability made by the palm oil industry, public perception does not always reflect this progress. UOB would like to see Musim Mas and other leading palm oil companies continue to raise public awareness about the industry's tremendous advancements in sustainability.

About: UOB and Musim Mas' business relationship started in 2010 in Indonesia. Today, UOB extends financial services to Musim Mas in Singapore, Indonesia, and China to support worldwide export sales and operational capital expenses. The Green Trade Facility was extended under the Green Finance Industry Taskforce's Green and Sustainable Trade Finance and Working Capital Framework. The Green Finance Industry Taskforce (GFIT), convened by the Monetary Authority of Singapore (MAS), comprises representatives from financial institutions, corporates, non-governmental organizations, and financial industry associations.

Notable achievements in 2021:

RECEIVED SILVER MEDAL IN THE 2021 ECOVADIS ASSESSMENT

RANKED 3RD OF 100 COMPANIES IN THE 2021 ZSL SPOTT ASSESSMENT

2021 CDP RATINGS: CLIMATE CHANGE (B-)*, FORESTS (A-) AND WATER SECURITY (B)

RECEIVED 11 GREEN PROPER AWARDS FOR 'GOING BEYOND ENVIRONMENTAL COMPLIANCE CRITERIA.'

EY has performed limited assurance procedures on these figures.



- The Musim Mas supply chain
- Stakeholder collaboration
- Grievances
- Product quality and safety

Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

GRIEVANCES

[GRI 2-16, 2-25, 2-26, 3-3, 308-2, 414-2]
[SASB FB-AG-430a.2]



Cases against Musim Mas via the RSPO

In 2021, there were four open cases against Musim Mas on the RSPO Case Tracker. Three were resolved and officially closed: one in January 2021, another in September 2021 and a third in December 2021. The findings on these cases are listed on the RSPO Case Tracker.

The fourth case remains open at the time of this report's publication. The case, filed in January 2021, is related to an alleged customary land ownership issue near one of our operations in West Sumatra. The latest update is available on [RSPO Case Tracker](#).

Supplier grievances

In 2021, four grievances were filed against our suppliers through the Musim Mas grievance mechanism, and three were closed within the year. We are working with the affected suppliers and stakeholders to resolve the remaining case from 2021 and the 23 active ones from previous years. As of 6 September 2022, three of these cases have been closed.

All grievances raised in 2021 involved non-compliant deforestation covering approximately 547 hectares. From 2019 to 2021, the total area linked to registered non-compliant deforestation 6,865 hectares. Confirmed deforestation and peatland development by suppliers that occurred after the cut-off date of 31 December 2015 will be processed for developing further remediation plans under our Controlled Purchase Protocol.

Grievances filed in or after January 2020 are subject to our [Controlled Purchase Protocol \(CPP\)](#), a process supporting the resolution of grievances while maintaining business relationships. This protocol is based on three principles: suppliers' willingness to engage, positivity to act, and proof of progress against agreed-upon milestones and criteria.

Musim Mas ceases business operations with suppliers who are unwilling to engage with us or repeatedly fail to meet agreed-upon milestones in cases involving critical grievances, including breaches to ND or NP commitments, lawbreaking, and withdrawal from the RSPO. There were no new supplier suspensions in 2021. However, three companies were re-admitted into our supply chain after submitting evidence showing compliance with our CPP re-entry criteria.

Third-party supplier grievances raised and closed

	Raised	Closed	Active
2021 cases	4	3	1
Cumulative cases 2019-2021	59	36	23

Note: as of 6 September 2022, three further cases have been closed and 20 remain open.

» [Further details are available on our Grievances webpage](#)





- The Musim Mas supply chain
- Stakeholder collaboration
- Grievances
- Product quality and safety

Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders

PRODUCT QUALITY AND SAFETY

[GRI 3-3] [SASB FB-AG-430b.1]



We adhere to strict policies on product quality and safety. Our products undergo rigorous and robust checks in line with relevant national standards and recognized certifications.

Nutrition and health

Delivering food products of high nutritional value is vital to Musim Mas. Palm and its derivatives can meet the rise in demand for ‘clean label’ products that consumers consider wholesome, nutritious, and free from contaminants. Palm-derived oils are not partially hydrogenated and naturally trans-fat-free. Palm oil is the world’s most widely consumed vegetable oil and has a natural balance of saturated and unsaturated fats. Musim Mas cultivates oil palms that are free of genetically modified organisms (GMOs).

Reducing contaminants

In recent years, vegetable oils, including palm oil, have come under scrutiny for potential process contaminants. Glycerol-based process contaminants, like 3-monochloropropane diol (3-MCPD) and glycidyl fatty acid esters (GE), pose a health risk to consumers. Their potential generation in the palm oil production process, including at the cultivation stage, must be identified and eliminated. Otherwise, they may be locked into the oil due to high refining temperatures during downstream operations in the palm oil value chain.

We go beyond industry norm and ensure that all lubricants used at Musim Mas mills are food-grade lubricants. We also use multiple mitigation strategies to reduce 3-MCPD throughout our value chain, including those outlined in the Codex Alimentarius International Food Standards, and continuously explore innovative technologies that can advance these strategies. Our refineries and products are certified to various domestic and international food safety standards, and we comply with all applicable EU regulations, including those governing contaminant thresholds for vegetable oils and fats.

As an integrated business, we use various approaches from plantation to refinery, including double refining and post-stripping technology, to mitigate the creation of potential contaminants by identifying and stopping positive entry routes and implementing processes that remove all such pollutants and their precursors. We also work closely with suppliers to support them in meeting the requirements of our customers.





● A focus on R&D

04

Pillar 4: Drive Innovation in Sustainable Practices





A focus on R&D





Pillar 4: Drive Innovation in Sustainable Practices

Musim Mas strives to innovate to address the growing demand for palm oil from civil society entities, customers, and consumers, maintain our business in a changing global market, and adapt to dynamic regulatory frameworks. We are

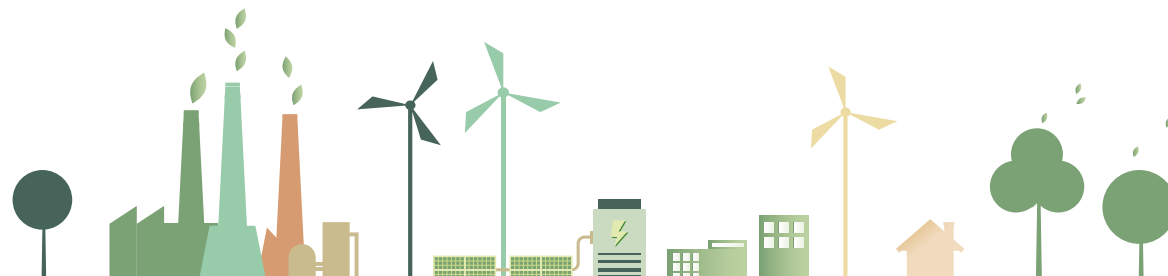
continuously finding ways to extend the reach of our sustainability commitments and ensure their meaningful application in our work and the landscapes we operate in.



Notable innovations in 2021

 <p>Continued focus on R&D to improve yields (see Improving yield)</p>	 <p>Established three Smallholders Hubs in 2021 to provide training in priority landscapes (see Independent smallholders)</p>	 <p>Partnership with AAK and Nestlé to address deforestation risks in Aceh (see Partnerships to support independent smallholders)</p>
 <p>New project to advance regenerative agriculture amongst independent palm oil smallholders in North Sumatra (see Partnerships to support independent smallholders)</p>	 <p>Partnership with AgriON and other stakeholders to develop new digital finance and financial learning platform (see Partnerships to support independent smallholders)</p>	 <p>Launched NDP Risk Management Framework with Musim Mas' approach to risk identification, assessment, mitigation, and monitoring (see NDP Risk Management Framework)</p>

In 2022, we have entered into a partnership with MUFG Bank and other stakeholders to develop a new digital service on green initiatives being undertaken by the food and agri-companies. More details will be made available on our website and future reports.





A focus on R&D

A FOCUS ON R&D

[GRI 3-3]

Improving yields

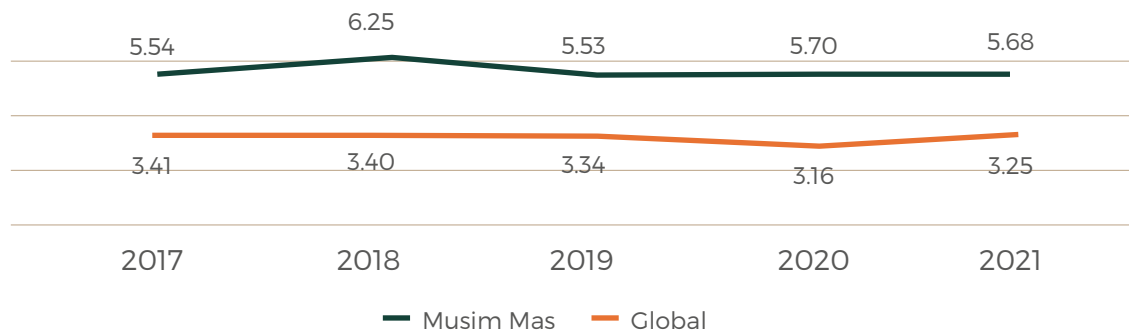
Upstream

We believe that the growth in oil palm production should be fueled by better yielding seeds, not land expansion. As such, Musim Mas invests in research and development (R&D) to maximize yields and improve land-use efficiency and productivity today to support the growing demand for palm oil over the next three decades. These efforts will increase crop yields and reduce the need to expand plantations, lessening our impacts on biodiversity and forests and lowering emissions.

Our Genetic and Agriculture Research Center, situated at our Riau plantation comprises dedicated units that manage and optimize agronomy, crop protection, and peat to maintain consistent and high production. It aims to provide our operations with the most advanced and elite oil palm planting materials, individually tailored to suit different environments, ensuring we generate optimal yields across all the Group's plantations. We achieve these goals through intensive breeding programs, adopting high nursery management standards, and developing planting materials with desirable traits like earlier harvesting, higher extraction rates, and increased disease resistance.

We lead the industry in crude palm oil (CPO) yield, which was 5.68 tonnes per hectare in 2021, 1.75 times higher than the global average.

Musim Mas CPO yield vs. global average 2017-2021 (MT CPO/ha)



Source of global data: www.oilworld.biz/p/palm-oil#palm-oil (available for purchase).

*2020 data for Musim Mas yield has been restated.



New food products and applications



Whether they're seeking to improve existing formulations or develop new consumer goods, food manufacturers and other Musim Mas customers continue to ask us for innovative new products. In 2019, Musim Mas established our Novel Ideas Center in Singapore. This R&D facility formulates palm oil innovations like specialty fats for the food and beverage industry. Musim Mas is proud to partner with our customers to meet their growing need for new palm oil products to create the exciting goods consumers demand. Applications include seasonal flavours that cater to regional tastes, gluten- and sugar-free products, and plant-based foods tailored to consumers' dietary requirements and restrictions.





Assurance Statement

[GRI 2-5]

INDEPENDENT LIMITED ASSURANCE STATEMENT IN CONNECTION WITH THE SUBJECT MATTER INCLUDED IN THE SUSTAINABILITY REPORT OF MUSIM MAS HOLDINGS PTE LTD FOR THE FINANCIAL YEAR ENDED 31 DECEMBER 2021

To the Management of Musim Mas,

Scope

We have been engaged by Musim Mas to perform a 'limited assurance engagement', as defined by International Standards on Assurance Engagements, here after referred to as the engagement, to report on the Sustainability Report of Musim Mas Holdings Pte Ltd ("Musim Mas") as set out in the Subject Matter and Criteria section (the "Subject Matter") below as of 30 September 2022 financial year ended 31 December 2021 ("FY2021") ("the Sustainability Report").

Subject Matter and Criteria

Our limited assurance engagement covers the following Subject Matters for the above-mentioned period:

No	ESG matter	Information for assurance	Scope for Palm Oil segment	Countries
1	Carbon footprint and energy	Climate risks assessment is conducted and published in Climate Change 2021 report on CDP	Mills, plantations and factories	Global+
2	Monitoring deforestation	Total hectares of suppliers' (group-level) concession monitored through a combination of methods as at 31 December 2021	Concession land owned by monitored suppliers (i.e. supplying mills integrated with plantations)	Indonesia, Malaysia & Thailand
3	Carbon footprint and energy	GHG emissions intensity across palm operations in 2021	RSPO-certified mills only	Indonesia
4	Carbon footprint and energy	Number of mills with operating methane capture facilities as at 31 December 2021	Mills	Indonesia
5	Water management	Water use intensity (m ³ /MT FFB processed) in 2021	RSPO-certified mills only	Indonesia



Assurance Statement

No	ESG matter	Information for assurance	Scope for Palm Oil segment	Countries
6	Maintaining water quality	BOD and COD quality (mg/l) for POME in 2021	RSPO-certified mills only	Indonesia
7	Improving the livelihoods of scheme smallholder farmers	Scheme smallholders that Musim Mas supports under these programmes: - KKPA: Number of KKPA programs and number of smallholders - VDP: Number of villages Note: Musim Mas operates two scheme smallholder programs: (1) <i>Kredit Koperasi Primer Anggota</i> (KKPA) and (2) Village Development Program (VDP)	Mills and plantations	Indonesia
8	Improving the livelihoods of independent smallholder farmers	(1) Number of independent smallholders involved in Musim Mas program that supplies to Musim Mas in 2021; (2) Total number of independent smallholders supplying to Musim Mas in 2021	Mills and plantations	Indonesia
9	Suppliers' progress on NDPE commitments	Percentage of suppliers who have completed the self-assessment tool as at 31 December 2021	All supplying mills during the year	Indonesia, Malaysia & Thailand
10	Suppliers' progress on NDPE commitments	Percentage of suppliers that have an NDPE policy or adopted Musim Mas Sustainability Policy as at 31 December 2021	All supplying mills during the year	Indonesia, Malaysia & Thailand
11	Suppliers' progress on NDPE commitments	Proportion of direct and indirect supply (volume) in 2021 that have NDPE commitment/policy and are certified under one of the following certification schemes: RSPO/ ISPO/ MSPO/ ISCC, or POIG-verified	All supplying mills during the year	Indonesia, Malaysia & Thailand
12	Assessing and managing NDP risk in the supply chain	Programs in place to support high-risk mills identified as at 31 December 2021	All supplying mills during the year	Indonesia, Malaysia & Thailand
13	Assessing and managing NDP risk in the supply chain	Percentage of suppliers classified under low- to medium- to high-risk mills as at 31 December 2021	All supplying mills during the year	Indonesia, Malaysia & Thailand

+ Climate risk assessment covers entities listed under 'Group Member' on RSPO website: <https://rspo.org/members/7582>.



Assurance Statement

Criteria applied by Musim Mas

In preparing the report, Musim Mas applied the criterion of “Accuracy” as defined by GRI and specific criteria determined by Musim Mas as being relevant for its sustainability performance. Such Criteria were specifically designed for sustainability performance; as a result, the Subject Matter may not be suitable for another purpose.

Management’s responsibilities

The Management is responsible for selecting Criteria, and for presenting the Subject Matter in accordance with that Criteria, in all material respects. This responsibility includes establishing and maintaining internal controls, maintaining adequate records and making estimates that are relevant to the preparation of the subject matter, such that it is free from material misstatement, whether due to fraud or error.

EY’s responsibilities

Our responsibility is to express a limited assurance conclusion on the Subject Matter based on the procedures we performed and evidence we obtained. We conducted our engagement in accordance with the International Standard for Assurance Engagements Other Than Audits or Reviews of Historical Financial Information (‘ISAE 3000’), International Standard for Assurance Engagements on Greenhouse Gas Statements (‘ISAE 3410’), and the terms of reference for this engagement as agreed with Musim Mas on 21 July 2022. Those standards require that we plan and perform our engagement to obtain limited assurance about whether, in all material respects, the Subject Matter is presented in accordance with the Criteria, and to issue a report. The nature, timing, and extent of the procedures selected depend on our judgment, including an assessment of the risk of material misstatement, whether due to fraud or error.

We believe that the evidence obtained is sufficient and appropriate to provide a basis for our limited assurance conclusions.

Our independence and quality control

We have maintained our independence and confirm that we have met the requirements of the Accounting and Corporate Regulatory Authority (‘ACRA’) Code of Professional Conduct and Ethics for Public Accountants and Accounting Entities (‘ACRA Code’), which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

EY also applies International Standard on Quality Control 1, *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements*, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Description of procedures performed

Procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. Our procedures were designed to obtain a limited level of assurance on which to base our conclusion and do not provide all the evidence that would be required to provide a reasonable level of assurance.

Although we considered the effectiveness of management’s internal controls when determining the nature and extent of our procedures, our assurance engagement was not designed to provide assurance on internal controls. Our procedures did not include testing controls or performing procedures relating to checking aggregation or calculation of data within IT systems.



Assurance Statement

GHG quantification process is subject to scientific uncertainty, which arises because of incomplete scientific knowledge about the measurement of GHGs. Additionally, GHG procedures are subject to estimation (or measurement) uncertainty resulting from the measurement and calculation processes used to quantify emissions within the bounds of existing scientific knowledge.

A limited assurance engagement consists of making enquiries, primarily of persons responsible for preparing the Subject Matter and related information and applying analytical and other appropriate procedures.

- 1 Inquiries with Musim Mas' Sustainability team to:
 - a) Understand principal business operations,
 - b) Appreciate key sustainability issues and developments,
 - c) Map out information flow for sustainability reporting and the relevant controls,
 - d) Identify data providers with their responsibilities, and
 - e) Recognise the likelihood of possible manipulation of sustainability information and data
- 2 Virtual interviews with and sought clarifications from employees and Management in Singapore and Indonesia (e.g. Sustainable Supply Chain team, Independent Smallholder team, Sustainability team for own operations) to understand key sustainability issues related to the selected indicators, data collection processes and accuracy of reporting.
- 3 Conducting of process walk-through of systems and processes for data aggregation and reporting with relevant personnel to understand the quality of checks and control mechanisms in relation to the Subject Matter in the Sustainability Report
- 4 Performing of analytical reviews on data and inquire with relevant personnel when anomalies are observed
- 5 Obtaining of documentation through sampling methods to check accuracy of the data in relation to the Subject Matter in the Sustainability Report

- 6 Checking data and statements had been correctly transcribed from corporate systems and / or supporting evidence, in relation to the Subject Matter in the Sustainability Report
- 7 Obtaining of relevant certifications and reports in relation to the Subject Matter in the Sustainability Report
- 8 Relying on Musim Mas' management representation letter on the Subject Matter in the Sustainability Report

We also performed such other procedures as we considered necessary in the circumstances.

Conclusion

Based on our procedures and the evidence obtained, we are not aware of any material modifications that should be made to the Subject Matter as of 30 September 2022 for the year ended 31 December 2021, in order for it to be in accordance with the Criteria.

Restricted use

This report is intended solely for the information and use of the Management of Musim Mas and is not intended to be and should not be used by anyone other than those specified parties.

Ernst & Young LLP
Signed for Ernst & Young LLP by
Simon Yeo
Partner, Climate Change and Sustainability Services
Singapore
30 September 2022






● Musim Mas' Contributions to the SDGs ● Glossary

Musim Mas' Contributions to the SDGs




In 2021, we mapped our material topics and program objectives to the SDGs and their targets, outlining the primary and secondary SDGs to which we contribute. We revisited this exercise for this report as part of our annual materiality update and mapped our downstream risks and opportunities for the first time.

Primary SDGs: the priority goals and targets we will report against and demonstrate contributions to. Corresponding SDG logos are displayed in relevant sections of this report.

SDG	Relevant SDG Target	How Musim Mas is contributing	Linked to Musim Mas Sustainability Policy Pillar
 SDG 2: ZERO HUNGER	2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous people, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	Including smallholders in our supply chain and rolling out training and engagement programs to support smallholders in addressing complex and interlinked barriers around yields, plantation management, land ownership, financial access and income, market access, economies of scale, and quality of life. Our programs cover scheme and independent smallholders in the landscapes we operate in.	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities
	2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	Investing in R&D to produce premium seedlings, increase yields, improve oil extraction rates, reduce reliance on chemicals, improve soil management and focus on sustainable agriculture to improve amount and quality of production and contribute to food security worldwide.	Pillar 4: Drive Innovation in Sustainable Practices
 SDG 4: QUALITY EDUCATION	4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	Providing access to school-age children living at Musim Mas plantations and children from surrounding communities by: <ul style="list-style-type: none"> - building and operating kindergartens and primary and secondary schools - providing access to education services and facilities - offering scholarships to deserving students. 	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities
 SDG 6: CLEAN WATER AND SANITATION	6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all	<ul style="list-style-type: none"> - Providing access to free and clean drinking water at employee housing - Building wells in communities 	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities
	6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	<ul style="list-style-type: none"> - Providing sanitation facilities and maintaining sanitary premises at estates - Ensuring access to clean toilets at operations - Providing toilets to communities and engaging communities on sanitation 	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities





Musim Mas' Contributions to the SDGs

SDG	Relevant SDG Target	How Musim Mas is contributing	Linked to Musim Mas Sustainability Policy Pillar
 <p>SDG 8: DECENT WORK AND ECONOMIC GROWTH</p>	8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	<ul style="list-style-type: none"> - Upholding the fundamental rights of employees, including freedom of association; ensuring employees are treated fairly without discrimination and with dignity and respect; ensuring wages provided are at least in line with legal requirements, and making sufficient provisions for employees to afford a basic but decent standard of living - Safeguarding the health and safety of employees and inculcating a culture of safe practices; preventing accidents and work-related illnesses; promoting the wellbeing of employees; providing free healthcare - Respecting all human rights outlined in the International Bill of Human Rights and UN covenants; adhering to the business principles set out in the UNGP BHR and applicable national laws; providing adequate housing, sanitation, community facilities, infrastructure, electricity, access to religious centers, etc. - Ensuring no discrimination in the workforce; respecting diversity and promoting gender equity; ensuring equal opportunities and full and effective participation in leadership for women at our operations - Maintaining Gender Committees, issuing family cards regardless of gender, providing breastfeeding centers etc.; building and running childcare centers for children below school-age 	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities
	8.7: Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms	<ul style="list-style-type: none"> - Implementing no forced labour policies - Adhering to no child labour policies 	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities
 <p>SDG 12: RESPONSIBLE CONSUMPTION AND PRODUCTION</p>	12.2: By 2030, achieve the sustainable management and efficient use of natural resources	<ul style="list-style-type: none"> - Optimizing water use and consumption at mills - Minimizing waste generated at operations; reducing, reusing, recycling, and recovering 100% of upstream waste; exploring ways to reduce and recycle midstream and downstream waste 	Pillar 2: Deliver Positive Environmental Impacts
	12.7: Promote public procurement practices that are sustainable, in accordance with national policies and priorities	<ul style="list-style-type: none"> - Continuously engaging with suppliers on our NDPE policy commitments through our NDPE roadmap to move the industry towards responsible and sustainable production; verifying NDPE progress using evidence-based approaches - Resolving external complaints and grievances in an accessible, effective, timely, and appropriate manner; bringing suppliers into compliance with NDPE requirements by enacting the CPP in cases of verified grievances on breached commitments 	Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders
		Complying with leading industry certification and verification schemes within our operations to progressively raise the bar within the palm oil sector; supporting leading industry certification and verification schemes to de-link oil palm expansion and deforestation, protect forests, optimize productivity and efficiency, etc.	Cross-cutting across all pillars
 <p>SDG 13: CLIMATE ACTION</p>	13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	Minimizing GHG emissions through targeted reduction plans; generating energy from process waste, and investing in renewable energy sources (e.g., methane capture facilities)	Pillar 2: Deliver Positive Environmental Impacts



Musim Mas' Contributions to the SDGs

SDG	Relevant SDG Target	How Musim Mas is contributing	Linked to Musim Mas Sustainability Policy Pillar
 <p>SDG 15: LIFE ON LAND</p>	15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	<ul style="list-style-type: none"> - Implementing our NDPE policy at Musim Mas operations; conserving, managing, and rehabilitating HCS forests and HCV areas, including riparian and buffer zones; protecting waterways; assessing the impact of our operations on biodiversity, water, and ecosystems - Implementing our NDPE policy to promote deforestation-free commodities throughout the supply chain; holding suppliers, including smallholders, accountable for deforestation activities - Managing the use and handling of pesticides and chemicals; optimizing and reducing chemical fertilizer and pesticide use; adopting organic substitutes where possible 	Pillar 2: Deliver Positive Environmental Impacts
	15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	<ul style="list-style-type: none"> - Managing and monitoring fires; applying BMP to manage existing plantations on peat; protecting soil from degradation; handling waste and chemicals responsibly - Implementing our NDPE policy to promote deforestation-free commodities throughout the supply chain; holding suppliers, including smallholders, accountable for deforestation activities 	Pillar 2: Deliver Positive Environmental Impacts
		<ul style="list-style-type: none"> - Working towards traceability to plantation and full visibility of suppliers to manage environmental and social risks in the supply chain 	Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders
 <p>SDG 17: PARTNERSHIPS FOR THE GOALS</p>	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	<ul style="list-style-type: none"> - Working with a wide range of industry players, government bodies, and civil society organizations to address pressing issues; collaborating on transforming the industry; maintaining transparent and accountable partnerships; contributing expertise, resources, and innovation to partnerships - Collaborating with private and public sector stakeholders in landscapes to transform the industry and support jurisdictional approaches - Staying responsive to customer needs and legislation on contaminant levels requiring mitigation efforts during the production of edible oils to minimize contaminants; increasing consumer awareness of nutritional, dietary, and health benefits 	Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders
		Develop new solutions for using sustainable palm oil-based functional blends and specialty fats to address different industry needs	Pillar 4: Drive Innovation in Sustainable Practices



Musim Mas' Contributions to the SDGs





Secondary SDGs: goals and targets we recognize to which we directly or indirectly contribute, with some level of reporting. Some of these goals and targets overlap with our primary SDGs.

SDG	Relevant SDG Target	Linked to Musim Mas Sustainability Policy Pillar
 SDG 1: NO POVERTY	Target 1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities
 SDG 2: ZERO HUNGER	Target 2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round Target 2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities
 SDG 4: QUALITY EDUCATION	Target 4.4: Providing development opportunities by investing in capacity building, training, and technical skills programs to help employees achieve their career goals	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities
 SDG 5: GENDER EQUALITY	Target 5.1: End all forms of discrimination against all women and girls everywhere Target 5.6: Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Program of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities
 SDG 8: DECENT WORK AND ECONOMIC GROWTH	Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	Pillar 1: Improve the Lives of Smallholders, Workers, and Communities Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders



● Musim Mas' Contributions to the SDGs ● Glossary

Musim Mas' Contributions to the SDGs

SDG	Relevant SDG Target	Linked to Musim Mas Sustainability Policy Pillar
 SDG 12: RESPONSIBLE CONSUMPTION AND PRODUCTION	<p>Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources</p> <p>Target 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle</p> <p>Target 12.7: Promote public procurement practices that are sustainable, in accordance with national policies and priorities</p>	<p>Pillar 2: Deliver Positive Environmental Impacts</p> <p>Pillar 3: Maintain Responsible and Enduring Relationships with Suppliers, Customers, and Stakeholders</p>
 SDG 13: CLIMATE ACTION	<p>Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries</p>	<p>Pillar 2: Deliver Positive Environmental Impacts</p>
 SDG 15: LIFE ON LAND	<p>Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements</p>	<p>Pillar 2: Deliver Positive Environmental Impacts</p>
 SDG 16: PEACE, JUSTICE AND STRONG INSTITUTIONS	<p>Target 16.5: Substantially reduce corruption and bribery in all their forms</p>	<p>Pillar 1: Improve the Lives of Smallholders, Workers, and Communities</p>



Glossary

Biodiversity The number and variety of plant and animal species within a region.

Biological oxygen demand (BOD) The amount of oxygen used when microorganisms decompose organic matter. Testing for BOD assesses the amount of organic matter in water.

Carbon dioxide equivalents (CO₂e) A universal measurement of the impact of releasing (or avoiding the release of) different greenhouse gases.

Chemical oxygen demand (COD) The amount of oxygen required to oxidize soluble and particulate organic matter in water. COD testing uses a strong chemical oxidizing agent to oxidize organic material in a wastewater sample under controlled conditions.

Concession Musim Mas uses the term to specifically refer to the physical boundaries of an area within a plantation, for example, when monitoring suppliers' lands and operations by satellite.

Consortium of Resource Experts (CORE) A group led by Proforest and Daemeter Consulting that ensures sustainable commodity production and sourcing. Musim Mas has been working with CORE to meet sustainable palm oil sourcing commitments since 2015.

Decent living wage (DLW) Remuneration for a standard workweek affording a decent standard of living for a worker and their family within a specific area, including food, water, housing, education, healthcare, transportation, clothing, other essential needs, and provisions for unexpected events.

Effluent Water from industrial activities, including mill processes, discharged into another body of water.

Fire Free Alliance (FFA) A multi-stakeholder group launched in 2016 committed to resolving Indonesia's persistent fire and haze issues arising from forest and land burning. Corporate members, including Musim Mas, implement the FFVP to engage local communities in preventing forest fires.

Fresh fruit bunch (FFB) The raw material harvested from an oil palm tree; weighs 10 to 40 kg, depending on the size and age of the tree.

Free, Prior and Informed Consent (FPIC) The principle that a community has the right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy, or use.

Global Reporting Initiative (GRI) A multi-stakeholder sustainability reporting standard providing guidelines on report content and indicators.

Greenhouse gas (GHG) emissions Atmospheric gases that absorb and emit radiation within the thermal infrared range. The primary greenhouse gases are water vapour, carbon dioxide, methane, nitrous oxide, and ozone. Scope 1 GHG emissions are emissions released into the atmosphere as a direct result of an activity or series of activities at the facility level. Scope 2 GHG emissions are released into the atmosphere from the indirect consumption of energy commodities.

High Carbon Stock Approach (HCSA) A global methodology used in agricultural land development planning and currently applied in fragmented tropical landscapes on mineral soils in the humid tropics. It distinguishes between HCS forest areas that require protection and degraded lands with low carbon and biodiversity values that may be considered for development.

High Conservation Value (HCV) Ecosystems of outstanding significance and critical importance due to their high biological, ecological, social, or cultural value. There are six types of HCVs, based on the social and environmental value of natural forests. These areas must be carefully managed and protected to maintain or enhance their value.

Identity Preserved RSPO supply-chain model separating sustainable palm oil from a single identifiable certified source from ordinary palm oil across every link in the supply chain.

Independent mills Mills under Musim Mas control that source from independent smallholders instead of Musim Mas plantations. Independent smallholders Small growers who cultivate up to 50 hectares, are self-financed, managed, and equipped but not bound to any one mill.

Indonesia Sustainable Palm Oil (ISPO) Indonesia's mandatory national sustainable palm oil standard.

Integrated pest management (IPM) The careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations.

International Finance Corporation (IFC) An international financial institution that offers investment, advisory, and asset-management services to encourage private-sector development in developing countries.

International Sustainability and Carbon Certificate (ISCC) A global biomass and bioenergy certification scheme.

Italian National Certification System for Biofuels and Bioliqids (IT SNC) Italy's framework guaranteeing the accuracy and independent verification of data demonstrating compliance with national biofuel and bioliqid sustainability criteria.

IUCN Red List A comprehensive global inventory of the conservation status of plant and animal species evaluating their extinction risk, published since 1964 by the Switzerland-based International Union for Conservation of Nature and Natural Resources (also known as The World Conservation Union) and updated every five to ten years.

Kredit Koperasi Primer Anggota (KKPA) A smallholder primary cooperative credit scheme, voluntarily initiated by Musim Mas in 1996. It provides smallholders with practical support to acquire the skills and technology needed to undertake palm oil cultivation.



Glossary

No Deforestation, No Peat and No Exploitation Implementation Reporting Framework (NDPE IRF) A reporting tool that helps companies understand and systematically track progress in delivering on their NDPE commitments in their palm oil supply chains.

No Deforestation, No Peat, No Exploitation (NDPE) policies or commitments Practices adopted by palm oil companies that prevent deforestation, development on peatlands, and the exploitation of workers, communities, and smallholders.

PalmGHG An RSPO tool that calculates the emissions generated and sequestered from activities and processes at plantations and mills. See how it works here.

Palm Oil Collaboration Group (POCG) A multi-stakeholder initiative that brings together companies from every link in the palm oil supply chain to accelerate the effective implementation of NDPE commitments.

Palm Oil Innovation Group (POIG) A multi-stakeholder initiative that promotes the adoption of responsible palm oil production practices by key players in the supply chain by developing and sharing a credible and verifiable benchmark that builds upon the RSPO Principles and Criteria, creating and promoting innovation.

Palm oil mill effluent (POME) A by-product of processed FFB. Peat An accumulation of partially decayed vegetable matter that forms in wetlands or peatlands, variously called bogs, moors, muskegs, pocosins, mires, and peat swamp forests.

Plantation Specifically refers to the place of production, be it a large industrial plantation with concessions and mills, a large farm without a mill, or a smallholder farm.

Program for Pollution Control, Evaluation, and Rating (PROPER) Indonesia's national environmental reporting initiative. It uses a colour-coded rating scheme to grade factories' pollution control performance against regulatory standards.

Radar for Detecting Deforestation (RADD) A radar-based forest monitoring system that detects and monitors tropical deforestation and degradation.

Roadmap The term 'roadmap' has two distinct meanings in this report. Our Roadmap to Responsible Supply Base (2020 and Beyond) is Musim Mas' communication piece on targets and plans to bring suppliers into compliance with our commitments. Musim Mas also compiles supplier roadmaps with timebound plans and clear implementation milestones to guide suppliers towards compliance with our NDPE commitments.

Roundtable on Sustainable Palm Oil (RSPO) A multi-stakeholder organization that has developed a certification scheme for sustainable palm oil. All RSPO members must comply with the RSPO Principles and Criteria (P&C), a set of stringent standards governing sustainable palm oil production.

Scheme smallholders Farmers operating under a program initiated by the Indonesian Government to encourage the development of smallholder plantations, where plantation companies (nucleus estates) assist and support surrounding community plantations.

Segregated A supply-chain model assuring that RSPO-certified palm oil and its derivatives delivered to the end-user originate only from RSPO-certified sources. It permits the mixing of RSPO-certified palm oil from a variety of sources.

Self-Assessment Tool A Musim Mas-developed tool for suppliers to self-declare operational information against Musim Mas sustainability criteria.

Supply shed A group of suppliers comprising mills and their associated plantations, as well as the independent plantations and smallholders that supply them.

Toxicity The degree to which a substance is harmful to living organisms. Toxicity in agricultural chemicals is measured using the LD50 methodology, i.e., the number of toxicity units corresponding to a lethal dose for 50% of a rat population.

Village Development Program (VDP) A Musim Mas program for scheme smallholders tailored to villages where plantations are community-managed rather than individually owned.



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