

Zeroing-in on Deforestation

Which agricultural commodities companies are addressing deforestation issues?

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Linking deforestation-related metrics to earnings for the Agricultural sector

This report follows on from CDP's research on Consumer Goods companies and deforestation, first published in November 2019. It ranks 27 of the largest and highest-impact palm oil, timber, soy and cattle traders and producers on the extent to which they are managing risks and seeking opportunities to tackle deforestation within their supply chains.

Agriculture and forestry sectors are responsible for over 80% of deforestation globally,⁽¹⁾ largely driven by four forest risk commodities (FRCs): cattle, soy, palm oil and timber. Forest loss is contributing to climate change and the loss of biodiversity and other vital ecosystem services on an unprecedented scale. The companies involved in producing FRCs must take action to halt deforestation if these issues are to be tackled.

FRC supply chains are complex and it is difficult to attribute deforestation to individual commodity producers. By assessing companies' deforestation risk management, we highlight that the worst performing companies are more likely to be exposed to deforestation within their supply chains.

The companies assessed in this report are key suppliers to the Consumer Goods sector covered in our previous report. Commodity producers' distance from consumers means they have been subject to less scrutiny than consumer goods companies. However, action from these producers is the critical first step in tackling deforestation throughout the supply chain.

Three key areas assessed in the League Table, which are aligned with the recommendations from the TCFD:

Transition risks: We assess companies on their land use associated with commodity production, as well as supply chain traceability and deforestation-related certification.

Transition opportunities: We analyse companies' investment in innovations that tackle deforestation and improve the sustainability of commodity production.

Governance & Strategy: We assess companies' deforestation-related commitments, targets, risk management policies and board level expertise. We also assess companies' CDP Forests 2019 score.

Key findings

- ▼ **Palm Oil:** **Sime Darby** top the ranking for palm oil, followed by **Golden Agri-Resources** in second. **First Resources** and **FGV Holdings** rank in the bottom two.
- ▼ **Timber:** **Stora Enso** rank in first place closely followed by **UPM & Mondi**. **International Paper** rank last.
- ▼ **Soy and Cattle:** **AMAGGI** rank first, followed by **Louis Dreyfus Company** in second. **JBS** and **Minerva Foods** rank second last and last respectively within the soy & cattle League Table.
- ▼ **Timber and palm oil companies are held to higher standards for tackling deforestation than soy and cattle companies** due to widespread uptake of sustainable certification. However, companies must go beyond certification to end deforestation.
- ▼ Across the eight timber companies an average of **73% of total timber supply is certified sustainably produced to FSC or PEFC standards**.
- ▼ **The ten oil palm companies covered in this report manage 47% of total land certified by RSPO.**
- ▼ **Currently no third-party deforestation certification standards exist for cattle producers.** While all soy companies assessed have some level of certified production, only four companies report the total percentage certified.
- ▼ **A significant proportion of companies' soy supply chains are unmapped and at risk of sourcing from areas where deforestation has occurred.** Only three soy companies state the total proportion of soy coming from indirect suppliers.
- ▼ **Supply chain traceability among cattle producers is extremely poor.** There is almost no visibility as to where cattle are bred or reared, with only one cattle company tracing supply beyond fattening farm level.
- ▼ **On average, 44% of total timber supply is produced on land companies own or lease long-term. In contrast, only one soy / cattle company owns land.** Palm oil mills and timber companies directly produce a larger proportion of their supply than soy and cattle companies, providing greater autonomy to manage deforestation risk.
- ▼ Across the regions of Brazil in which the companies in this report operate, on average **close to four million hectares of tree loss occurred from 2015-2017**. The ten cattle & soy companies covered produced over 60 Mt of soy and 1.4 Mt of beef in the same period.
- ▼ **All cattle and soy companies in our sample continue to operate within the Amazon biome, which has the highest rate of tree loss in Brazil.**
- ▼ **The tree loss to production ratio is 10x greater for cattle companies than it is for soy companies.**
- ▼ **Timber companies are ahead of the other commodities** with five companies investing in radical or transformative sustainable forest management practices and seven companies investing in circular economy products and services.
- ▼ **50% of oil palm companies are engaging in multi-stakeholder partnerships to tackle illegal deforestation** and improve the sustainability of agriculture at scale.
- ▼ **Soy & cattle companies' innovations fail to tackle deforestation at scale** and are limited to small-scale incremental initiatives providing education and financing to promote sustainable agriculture and reduce deforestation.
- ▼ **Palm oil companies have strong deforestation-related policy commitments**, reflecting the RSPO's more stringent standards.

▼ **Timber policy commitments focus on avoiding illegally produced timber and protecting high conservation value areas**, while specific commitments on peatland conservation and stopping clearance by burning or clearcutting are lacking.

▼ Eight out of 10 soy and cattle companies committed to zero deforestation and two to net-zero deforestation. However, **limited traceability means companies lack oversight of their supply chains to identify areas where tree loss is still occurring.**

The summary League Tables below present headline company findings. They are based on detailed analysis across a range of deforestation indicators which could have a significant impact on company performance. Companies placed towards the bottom are deemed less prepared to manage deforestation risk within their supply chains.

Note: Due to the fact that different metrics and scoring methodologies are used for each commodity, the three League Tables are not comparable. The overall weighted ranks are calculated relative to the companies within each sample.

Figure 1: Palm oil League Table summary⁽ⁱ⁾

LT rank	Company	Country	Market Cap US\$bn Q2 2020	Weighted rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
1	Sime Darby Plantation	Malaysia	8.3	3.45	1	2	5
2	Golden Agri-Resources	Singapore	1.4	3.55	2	4	2
3	Wilmar International	Singapore	21.8	4.04	7	3	1
4	PT Musim Mas	Singapore	Private	4.08	10	1	3
5	Cargill	United States	Private	4.87	4	6	7
6	IOI Corporation Bhd	Malaysia	6.4	5.13	6	7	6
7	Olam International	Singapore	3.1	5.42	5	9	4
8	Kuala Lumpur Kepong	Malaysia	5.8	5.80	3	8	9
9	First Resources Ltd	Singapore	1.5	6.64	8	5	10
10	FGV Holdings Berhad	Malaysia	4.0	7.10	9	10	8
Weighting					40%	30%	30%

Source: CDP

Figure 2: Timber League Table summary⁽ⁱ⁾

LT rank	Company	Country	Market Cap US\$bn Q2 2020	Weighted rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
1	Stora Enso	Finland	13.3	3.84	6	2	2
2	UPM-Kymmene Corporation	Finland	16.6	3.93	7	1	3
3	Mondi Plc	United Kingdom	10.5	3.95	5	5	1
4	Empresas CMPC	Chile	5.2	4.27	1	4	7
5	Suzano	Brazil	12.0	4.38	2	3	8
6	Asia Pulp & Paper	Indonesia	Private	5.26	3	7	6
7	Weyerhaeuser	United States	22.1	5.92	4	8	5
8	International Paper	United States	16.8	6.18	8	6	4
Weighting					40%	30%	30%

Source: CDP

Figure 3: Soy & Cattle League Table summary⁽ⁱ⁾

LT rank	Company	Country	Market Cap US\$bn Q2 2020	Weighted rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
1	AMAGGI	Brazil	Private	3.13	3	1	5
2	Louis Dreyfus Company	Netherlands	Private	3.21	2	2	3
3	Archer Daniels Midland	United States	27.2	4.29	4	6	1
4	Bunge	United States	7.1	4.35	6	3	2
5	Cargill	United States	Private	4.69	1	5	6
6	COFCO International	China	Private	5.75	5	9	7
7	Marfrig	Brazil	1.8	5.84	8	4	4
8	Glencore Agriculture	Netherlands	Private	6.82	7	10	8
9	JBS	Brazil	9.3	7.69	9	7	9
10	Minerva Foods	Brazil	1.1	8.55	10	8	10
Weighting					40%	30%	30%

(i) Weighted ranks are calculated for each area. We display non-weighted ranks in each summary League Table for simplicity only.
Source: CDP

Overview

Agriculture and forestry are responsible for over 80% of deforestation globally,⁽²⁾ largely driven by four forest risk commodities (FRCs): cattle, soy, palm oil and timber products. With population growth and rising incomes globally, this trend is expected to continue with global arable land area increasing to 2050 before we reach peak farmland.⁽²⁾

Deforestation is the second largest source of anthropogenic greenhouse gas emissions globally, causing the loss of biodiversity, ecosystem services and carbon sinks on an unprecedented scale.⁽³⁾ 25% of the world's population also rely on forests for their livelihoods⁽⁴⁾ and deforestation has severe socio-economic impacts, including increased poverty, income inequality and conflict over land.

At the same time, the conversion of forests into farms and plantations has delivered huge returns on investment for a small number of large agribusiness and forestry companies. These new farms and plantations are often large-scale monocultures, contributing to the loss of 75% percent of the world's crop diversity over the last century. Less diversity in crop and animal varieties leaves agroecosystems and forests less resilient to climate change as well as pests and disease. The companies covered in this report are now facing increasing pressure to halt deforestation within their supply chains and improve the sustainability of agricultural production.

Tracing the roots of deforestation

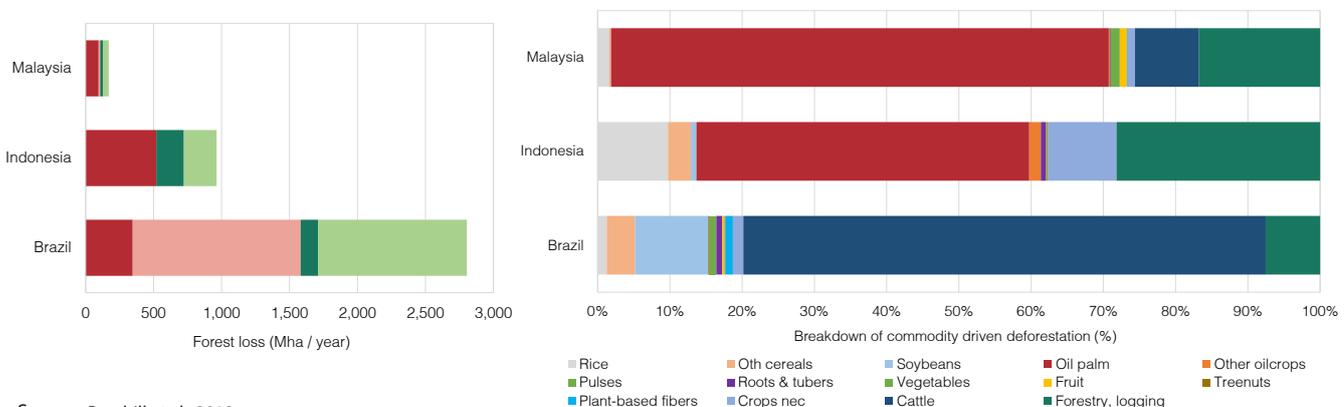
40% of commodity-led deforestation was attributed to cattle meat production between 2005 – 2015⁽⁵⁾, particularly across South America, and Brazil especially. Cattle production in this region is highly diffuse, with a large number of small to medium-size producers who breed, rear and “fatten” cattle which is then sold to the larger agribusiness companies covered in this report. Transparency across these complex value chains remains poor and cattle companies are some of the worst performers when it comes to taking robust action against deforestation.

Soy production accounted for around 7% of commodity-led forest loss in the same period, largely in Brazil and mainly driven by medium-size farms who again sell to the agribusiness firms analyzed in this report. Whilst transparency is slightly better than for cattle and sustainable certification is gaining some uptake, these larger soy companies also lag behind in tackling deforestation in their supply chains.

Forest products have contributed to around 15% of forest loss in this period, and are a major driver of tropical deforestation in Central and South America and South East Asia. Global timber supply chains are complex and fragmented, with forests often located in remote areas, far from law enforcement. This has created an illegal timber market worth an estimated US\$15 billion,⁽⁶⁾ with the profits from illegal wood often used to establish agribusiness operations, such as oil palm plantations and soy or cattle farms. Sustainable certification has seen widespread uptake across the forestry sector, improving basic supply chain traceability and minimum standards for sustainability. However, forestry businesses continue to drive deforestation and companies must go beyond certification to develop sustainable forestry at scale.

Palm oil production accounted for around 7% of commodity-led deforestation from 2005 - 2015, largely in Indonesia and Malaysia where over 80% of global production takes place. Around 40% of palm oil is produced by smallholder farmers, providing opportunities for rural economic development, but also posing challenges for supply chain transparency and sustainability. Palm oil plantations are also often established on carbon-rich peatlands which make up 60% of total forest soil carbon in Malaysia and 74% in Indonesia, generating huge carbon emissions and the loss of valuable carbon sinks.⁽⁷⁾

Figure 4: Drivers of deforestation 2005-2013



Source: Pendrill et al., 2019

2. FAO, 2012, World agriculture towards 2030/2050

3. FAO, 2010, Crop biodiversity: use it or lose it FAO

4. FAO, 2015, Forests and poverty reduction

5. Pendrill et al., 2019, Deforestation displaced: trade in forest risk commodities and the prospects for a global forests transition

6. World Bank, 2012, Justice for forests: improving criminal justice efforts to combat illegal logging

7. Page et al., 2010, Global and regional importance of the tropical peatland carbon pool

Producer power

Consolidation and expansion of the agri-food businesses who produce, buy and trade commodities globally has given these actors significant market power. Agricultural value chains are often hourglass shaped, with a large number of upstream producers selling to primary processors and aggregators, who in turn sell to a small number of traders and refiners. For example, 95% of global palm oil trade is controlled by five companies, despite 40% of production being carried out by smallholder farmers. Commodities are then often sold to a small number of manufacturers, before reaching the downstream retailers to sell the finished product to consumers.

Market liberalization and improvements in agricultural production and transportation has helped incentivize these companies to break up production processes and spread them out geographically. Fragmented supply chains reduce control and transparency, increasing the risk of unsustainable and illegal production practices, and separating consumers from the negative impacts of production, including deforestation. Consumer goods companies covered in our last report are thus reliant on these large commodity traders to meet their deforestation commitments.

Figure 5: Agricultural commodity supply chain actors

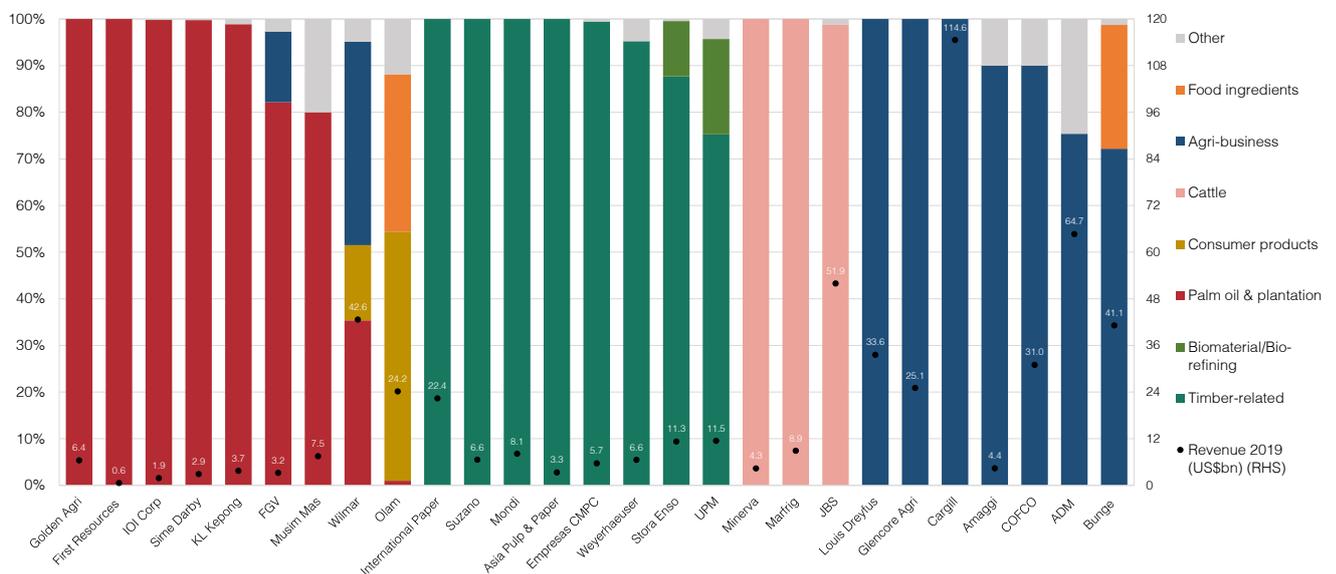


Transformation to food systems

Systemic changes to global food systems are needed to halt the threat to global forests and enhance global food security. This will require action from a variety of stakeholders, from policymakers, farmers and traders to manufacturers and retailers. Increasing market penetration of sustainability standards across commodities could help to improve traceability and sustainability. This would be enhanced by policies and regulation aimed at tackling commodity-led deforestation, such as legislation the UK plans to introduce to tackle tropical deforestation.

Collaboration will be key to tackle deforestation and create diverse climate-smart agricultural and forestry systems. Increasingly upstream operators are looking at multi-stakeholder collaboration to implement sustainable production solutions at scale, although these are limited to companies within the forestry products and palm oil producers. Whilst commodity producers' distance from consumers means they have been subject to less scrutiny than consumer goods companies, action from these upstream actors is the critical first step in tackling deforestation throughout the supply chain and clean up commodity supply chains.

Figure 6: Revenue split by business (2019)



Source: CDP, company reports

Key report findings

Overall findings

- ▼ **Palm oil and timber companies are held to higher standards for tackling deforestation than soy and cattle companies** due to widespread uptake of sustainable certification. However, companies must go beyond certification to end deforestation.
- ▼ **Palm oil and timber companies have comprehensive traceability across their supply chains**, whereas soy companies are only tracking their direct suppliers and cattle companies fail to trace beyond the fattening farm level.
- ▼ **Oil palm mills and timber companies directly produce a larger proportion of their supply than soy & cattle companies**, providing greater autonomy to manage deforestation risk.
- ▼ **Timber companies are ahead of palm oil, cattle and soy companies in terms of innovation.** More than 10% of timber and palm oil companies' top 10 innovations are assessed as being transformative, whilst the figure is only 2% for soy and cattle companies. Timber companies are uniquely positioned to develop more sustainable forests whilst contributing to the circular economy.
- ▼ **Palm oil companies have strong deforestation-related policy commitments**, reflecting RSPO's more stringent standards, whilst there is greater variation in soy, cattle and timber companies' policy commitments.

Palm oil

- ▼ **Sime Darby ranks first in transition risks and top in the overall palm oil League Table.** The company manages 3.6% of land harvested for the commodity globally and leads the sector on land certification rates.
- ▼ **Musim Mas ranks last in transition risks and first in transition opportunities.** The company does not have full traceability of Fresh Fruit Bunches (FFB) supply to plantation of origin, and smallholders supply just 3% of FFB to the company's mills. However, eight of its top 10 innovations are considered to be radical or transformative.
- ▼ **FGV ranks last, with just three out of its top 10 innovations considered to be radical or transformative.** It also performs weakly on certification.
- ▼ **There is a divide between upstream and downstream traceability and certification;** traceability of supply to plantation of origin is 95% for upstream operations and 57% for downstream operations, while RSPO certified supply accounts for 58% of upstream FFB supply and 17% of downstream palm oil / palm oil product uptake.
- ▼ **Five of the 10 of palm oil companies are engaged in multi-stakeholder partnerships to tackle illegal deforestation and improve the sustainability of production at scale.** Multi-stakeholder collaboration has not been limited to transformative landscape initiatives and includes cooperation on the development of sophisticated technological tools such as radical supply chain monitoring systems.
- ▼ **Nine out of 10 companies have committed to zero deforestation and one to net-zero deforestation**, and all company policies comprise NDPE commitments.

Timber

- ▼ **Stora Enso ranks first in the overall timber League Table**, ranking second in governance and strategy and transition opportunities, with a range of sustainable forestry and circular economy innovations. However, the company performs poorly in transition risk, with poor disclosure for sustainable certification.
- ▼ **UPM ranks second overall, followed closely by Mondi.** UPM ranks second last in transition risk, directly producing a relatively small proportion of its timber but performs top for transition opportunities with several transformative sustainable forestry innovations. Mondi performs top for governance and strategy, with strong deforestation-related policy commitments.
- ▼ **International Paper ranks last overall**, ranking last in transition risk with lower levels of total certified supply relative to its peers.
- ▼ **Certification uptake is widespread, raising the baseline for sustainable timber production across the board.** An average of 73% of timber production is certified to FSC or PEFC standards across the eight companies.
- ▼ Timber companies are in a unique position to develop sustainable forestry whilst contributing to the circular economy. **However, systematic change is needed to achieve sustainable forestry at scale.**
- ▼ **Timber policy commitments focus on avoiding illegally produced timber and biodiversity conservation** but lack specific commitments on peatland conservation and stopping clearance by burning or clearcutting.

Soy & Cattle

- ▼ **AMAGGI rank first overall.** Despite performing poorly on the land use sub-metric within transition risk, it has the highest level of supplier traceability and ranks first within transition opportunities. Louis Dreyfus rank second overall, performing well across all sections.
- ▼ **Glencore Agriculture, JBS and Minerva rank in the bottom three.** Glencore is the lowest performing soy company, ranking last in transition opportunities. JBS ranks second last and Minerva last in both the transition risk and governance and strategy sections.
- ▼ **All cattle and soy companies in our sample continue to operate within the Amazon biome**, which has the highest rate of tree loss in Brazil. The tree loss to production ratio is 10x greater for cattle companies than it is for soy companies.
- ▼ **Soy companies are only tracing production from direct suppliers** within their supply chains, while **traceability among cattle producers is extremely poor**, with almost no visibility as to where cattle are bred or reared.
- ▼ **Soy & cattle companies' innovations fail to tackle deforestation at scale** and are limited to small-scale incremental initiatives providing education and financing to promote sustainable agriculture and reduce deforestation. Only two companies, Bunge and Louis Dreyfus, have innovations relating to sustainable financing initiatives that are considered transformative.
- ▼ **Eight of the 10 soy & cattle companies have zero deforestation commitments and two have net-zero commitments.** Although all seven soy companies have set traceability targets these are limited to direct suppliers only.

Company selection and classification

Palm Oil: Companies were selected from the largest publicly listed palm oil producers with downstream processing and trading operations. Selection criteria included palm oil production volumes, land ownership, market capitalization and business activities. The 10 companies chosen manage 15% of global palm oil production area.

Timber: Companies were selected from the largest publicly listed forestry companies, based on timber production volumes, land ownership, market capitalization and proximity to high deforestation-risk areas. The eight chosen companies own or long-term lease nearly 38 million hectares of forests globally.

Soy and Cattle: Companies were selected from the largest public and private listed soy and cattle producers and traders operating in South America. The companies were selected based on soy and cattle production and processing volumes, market capitalization and business activities.

Linking our findings to investment choices

We recognize that investment decisions are based on a multitude of different factors and that some of these can be misaligned with zero-deforestation efforts. Our League Table identifies company readiness for the transition towards sustainable commodity supply chains, meaning that companies towards the bottom of our League Table are potentially higher risk investments from the perspective of deforestation than those towards the top.

Methodology

We score each company based on a number of metrics which are ranked and then weighted within each key area (see Figure 7 for metric weightings within each key area). We then assign traffic light colours based on these weighted ranks. We calculate the overall League Table score by collating the weighted ranks for each key area.

Data is compiled from multiple sources including: CDP questionnaire responses, company annual reports, CSR reports, websites, investor presentations and third party sources such as Trase and Global Forest Watch.

Palm oil, timber and soy & cattle companies have been analysed separately using bespoke metrics and sub-metrics across the commodities. The report is presented with palm oil companies first, followed by timber companies and soy & cattle companies last.

Figure 7: Summary of key areas, associated metrics and weights within the League Table

Key area in League Table	Financial Impact	Metrics	Sub-metrics	Metric weighting	Key area weighting
Transition risks	Measures to improve traceability, sustainable certification and control of agricultural and forestry supply chains can improve companies' ability to manage deforestation risk, improving the security and stability of commodity supply and delivering sales and revenue growth.	Land use	Palm oil: Land managed, % conservation & smallholders, certified land as % of total landbank	40%	40%
			Timber: Land owned and leased, total % land set aside for conservation, % land owned/ leased productive forest area	40%	
			Soy & Cattle: Tree loss intensity, tree loss risk trend	60%	
		Certification & Traceability	Palm oil: Traceability and certification to a mill and refinery levels and procurement	60%	
Timber: Traceability, certification and procurement	60%				
Soy & Cattle: Traceability, certification and procurement from indirect suppliers	40%				
Transition opportunities	Companies collaborating across agricultural and forestry sectors are best placed to drive systematic improvements to the sustainability of production.	Sustainable innovation - all commodities		70%	30%
		Capital flexibility - all commodities		30%	
Deforestation governance & strategy	Strength of companies' deforestation governance provides insight into companies' strategies in progressing towards zero-deforestation supply chains and capitalising on sustainable production opportunities.	Sustainable production policy commitments & memberships		40%	30%
		Board & executive level management		30%	
		Targets		20%	
		CDP score		10%	

Source: CDP

Palm Oil

Transition risk

- ▼ Sime Darby ranks first, leading the sector on land certification with 98% of company-owned estates and 78% of scheme smallholder estates certified.
- ▼ The 10 oil palm companies covered manage 47% of RSPO certified land.
- ▼ Musim Mas ranks last. The company does not have full traceability of FFB supply to plantation of origin, and smallholders supply just 3% of FFB to the company's mills.

Overview

Oil palm is the world's highest yielding oil crop, providing a third of global supply on 6% of the total production area.⁽⁸⁾ This efficiency has driven huge global demand for oil palm products, namely palm oil, particularly in food applications which accounts for 78% of global consumption.⁽⁹⁾ However, oil palm production accounted for around 7% of global commodity-led deforestation from 2005 and 2015, particularly in Indonesia and Malaysia where over 80% of production takes place.

Oil palm production is restricted to the tropics and the total area suitable production is set to shrink under current climate change predictions, as the crop is sensitive to changes in rainfall and temperature. The geographic spread of production is therefore projected to shift from Southeast Asia to other developing regions, such as Africa and South America, potentially triggering further tropical deforestation.

Palm oil mills are located within 50-100km of plantations to preserve fruit quality, which should give mill operators better visibility of the sustainability of their supply. However, palm oil production continues to be associated with widespread deforestation across Indonesia and Malaysia.

Downstream processing and trading is dominated by a handful of conglomerates, sourcing from both their own plantations and third-party suppliers. These companies are beginning to manage deforestation risk by improving traceability and signing up to third party certification standards such as the Roundtable on Sustainable Palm Oil (RSPO). However, there is still a long way to go before deforestation is eliminated from palm oil supply chains.

Companies included in the report manage and control 2.9 million hectares (ha) of land, which is approximately 15% of the global production area. This includes the nucleus plantation estates companies own and their associated smallholder schemes. Companies owning and managing more land through smallholder schemes are more likely to be able to respond deforestation risk.

Transition risks are assessed using the following metrics:

Metric 1) Land Use (40%): This metric assesses the total area of land companies own, the proportion managed through smallholder schemes, the proportion of RSPO certified land and the proportion set aside for conservation.

Metric 2) Traceability, Certification and Procurement (60%): We assess companies' supply chain transparency and the proportion of supply that meets third party certification standards.

Figure 8: Transition risks summary

Company	Land use	Traceability, certification and procurement	Overall weighted rank	Transition risks rank
Sime Darby	1	3	4.0	1
Golden Agri	3	2	4.2	2
Kuala Lumpur Kepong	6	1	4.7	3
Cargill	4	4	4.9	4
Olam International	2	7	5.1	5
IOI Corporation	8	5	5.7	6
Wilmar	5	9	6.0	7
First Resources	10	6	6.5	8
FGV Holdings	9	8	6.8	9
Musim Mas	7	10	7.0	10
Weighting	40%	60%		

Note: In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks in this summary for simplicity only.

Source: CDP

8. Rival and Levang, 2013, Agroecological practices in oil palm plantations: examples from the field

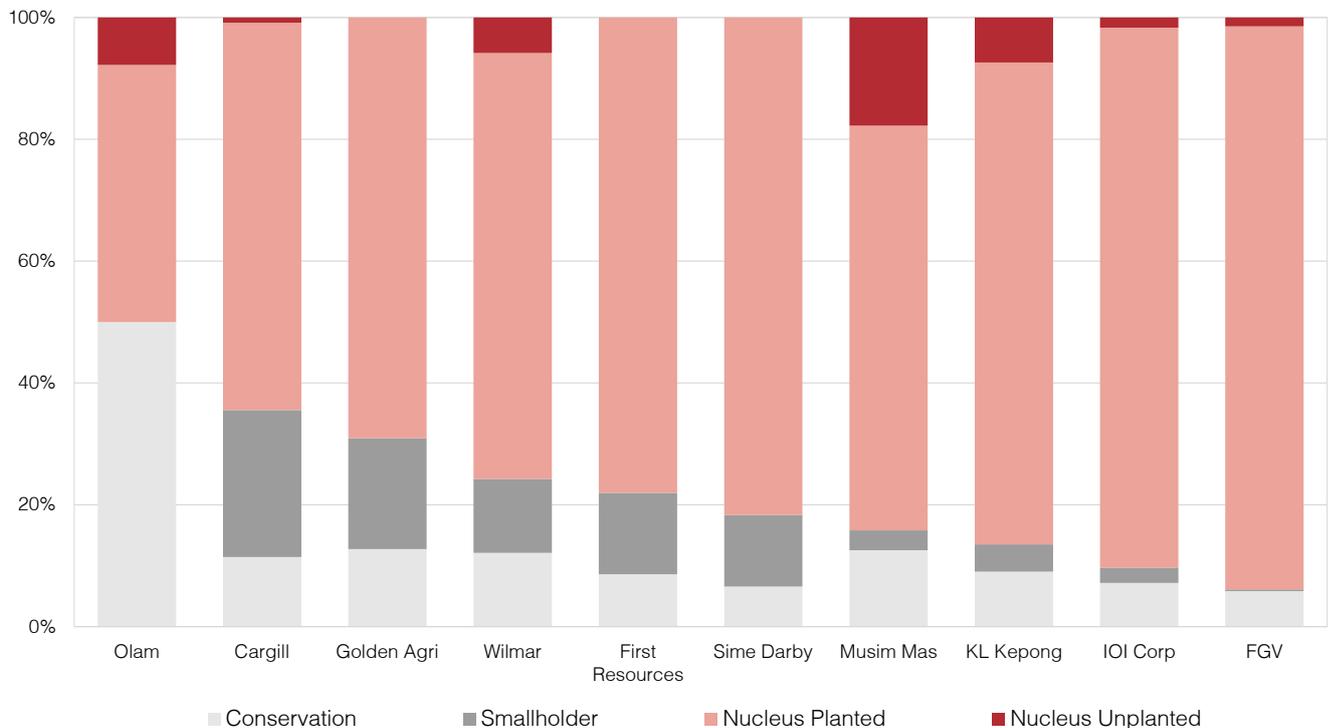
9. IISD, 2019, Global Market Report: Palm Oil

Land use highlights

Companies managing larger areas of land for the cultivation of palm oil have better control over the supply of palm oil Fresh Fruit Bunches (FFB) into their supply chains. Other indicators of a company's alignment with sustainable practices include land set aside for purposes of conservation, proportion of RSPO certified land within its operations and proportion of land managed through smallholder schemes.

- ▼ Companies included in the report manage 48% of the 4.4 million hectares (Mha) of land currently certified by RSPO. RSPO Oil Grower Members manage 6.3 Mha of land for the cultivation of palm oil including non-certified land, accounting for a third of total land harvested for the commodity globally.⁽¹⁰⁾
- ▼ Sime Darby manages 730,000 ha for the cultivation of palm oil, accounting for 3.6% of the land harvested for the commodity globally. The company leads the sector on land certification rates, certifying 98% of company-owned estates and 78% of scheme smallholder estates.
- ▼ Golden Agri manages 570,000 ha of land, making it another significant landowner. Certified land accounts for just 45% of total land managed, which is significantly lower than the sector average of 63%.
- ▼ 50% of land managed by Olam has been set aside for conservation, the highest proportion amongst its peers.
- ▼ Conglomerates dominating global trade in palm oil do not have meaningful direct control of the land on which the commodity is cultivated. Wilmar, Musim Mas, Golden Agri, IOI and Cargill control 90% of global trade but manage 8% of land used in the cultivation of the commodity.⁽¹¹⁾
- ▼ Cargill manages the highest proportion of land under scheme smallholders, with such schemes accounting for 24% of land managed. Scheme smallholders are structurally bound by contract to a particular mill under the ownership or control of the member and indicate the company's commitment towards smallholder inclusion and livelihood improvement.
- ▼ Smallholder capacity building and inclusion is key to sustainable palm oil production. Although smallholders contribute to 40% of global palm oil production, land managed under smallholder schemes (as defined by the RSPO) make up an average of just 9% of total land managed for the group.

Figure 9: Breakdown of land managed or controlled by companies⁽ⁱ⁾



(i) Smallholders defined by RSPO as scheme smallholders that are structurally bound by contract, credit agreement and/or planning to a particular mill under the ownership or control of the member.

Source: CDP, RSPO, company reports

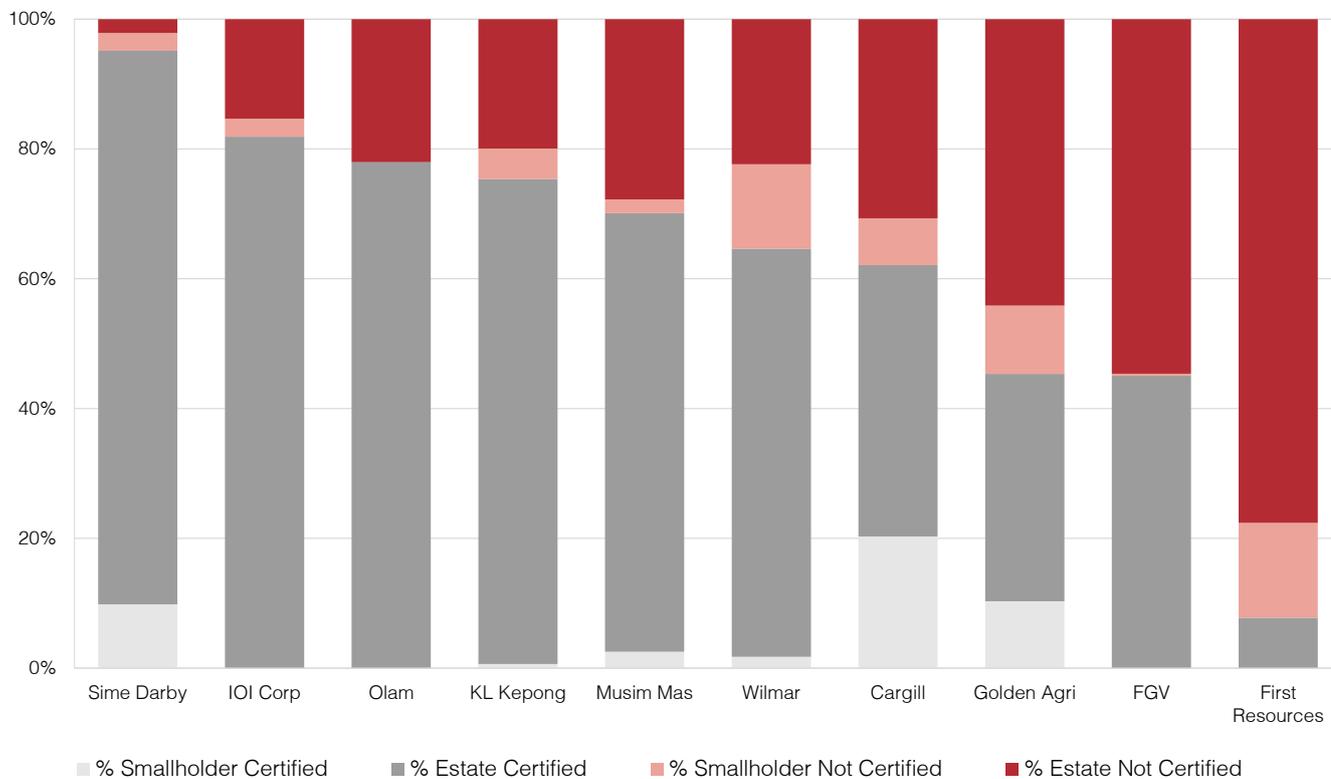
10. FAOSTAT

11. FT, 2016, Cargill and Bunge refuse to cut ties with palm oil trader

First Resources reported a certified landbank of 8% indicating a lack of commitment and progress towards achieving 100% certification. FGV Holdings and Golden Agri also reported landbank certification of less than 50%.

IOI, First Resources and FGV Holdings reported the absence of any certified landbanks under smallholder schemes indicating a lack of leadership and commitment towards improving sustainable practices among smallholders.

Figure 10: Breakdown of certified land managed or controlled by companies



Source: CDP, RSPO, company reports

Traceability, certification and procurement highlights

The quality of produce supplied to companies at both mill and processing facility level provides an indication of deforestation-related risks related to the company's inputs. Traceability and certification are not fool-proof indicators of deforestation-free supply, but these metrics greatly improve companies' oversight of the commodity supply chain from plantation to their facilities.

Traceability should be seen primarily as a means for companies to identify and address instances of illegality and unsustainable practices in the supply chain. With improved oversight companies are better positioned to act quickly to isolate sources of non-compliant palm oil and engage with these suppliers to address uncovered issues, minimising threats to business activities.

Certification provides actors along the palm oil value chain with assurances concerning supply chain sustainability, while also increasing market access and reducing risks related to potential regulatory changes or introduction of zero-deforestation policies among purchasers. Market penetration of the RSPO certification standard is however low: just 16.49 million tonnes of palm oil was certified sustainable by the RSPO last year, accounting for 19% of global palm oil produced.¹² In addition, RSPO certification has limited capacity to reach highly fragmented markets in the developing world where consumers have little interest in paying a premium for certified products.

100% of Certified Palm Oil (CPO) produced by Golden Agri, Cargill, Musim Mas and First Resources is produced in Indonesia. 69% of CPO is produced by Wilmar in the country.

More than 90% of CPO is produced by FGV Holdings and IOI in Malaysia.

Average proportion of FFB supplied directly from smallholders to mills owned by the group is 13%, indicating a lack of smallholder supply transformation at milling operations. Smallholders directly supply less than 5% of FFB at mills owned by IOI, Olam and Musim Mas.

Olam produces all its CPO in Gabon, the only company with no Southeast Asian CPO production.

12. RSPO (<https://www.rspo.org/impact>)

- Third-party suppliers including middlemen, traders or third-party collection centres supply more than 30% of FFB required at mills owned by FGV Holdings and Wilmar.
- Four out of nine companies covered do not trace their entire supply of FFB to company-owned mills to plantation of origin. FGV Holdings and Musim Mas have the lowest level of traceability visibility of 80% of their FFB supply to plantation of origin.
- More than 80% of FFB sourced by mills owned by Sime Darby, IOI, Olam and Musim Mas is RSPO certified. Certified FFB supply is less than half of total supply at mills owned by Wilmar, FGV Holdings and First Resources.
- Certification of milling facilities range from 12% to 100%. Certified FFB supply account for more than 80% of FFB supply at six out of 10 companies.

Figure 11: Quality of FFB supply to company owned mills

Company	Supply of Palm Oil FFB to Company-Owned Mills				
	100% Traceable to Plantation	% RSPO Certified	Supply From 3rd Party	Supply from Smallholders	% Mills Certified
Sime Darby	✘	88%	10%	7%	99%
Wilmar	✔	33%	36%	5%	58%
IOI Corporation	✔	93%	0%	1%	93%
Golden Agri	✔	56%	0%	23%	63%
Kuala Lumpur Kepong	✔	58%	2%	24%	88%
FGV Holdings	✘	15%	43%	25%	49%
Olam International	✔	80%	0%	1%	100%
Cargill	No data	69%	0%	34%	89%
Musim Mas	✘	81%	13%	3%	86%
First Resources	✘	8%	0%	9%	12%

Source: CDP, RSPO company reports

- Companies able to trace a higher proportion of palm oil and palm oil product uptake to plantation of origin can identify deforestation risks more rapidly. First Resources tops the group and is able to trace more than 90% of CPO supply to plantation of origin, compared to the peer group average of 57%. Almost all CPO supplied to refineries owned by First Resources originate from company-owned mills where traceability is high.
- Traceability of palm oil and palm oil product uptake is lowest at Wilmar, where 90% of CPO uptake originates from third party mills, of which 15% is traceable to plantation of origin. The complexity of the group's CPO supply reduces the company's ability to identify deforestation-related issues.
- At processor level, Sime Darby has the highest proportion of certified palm oil and palm oil product uptake, with certified volumes accounting for 67% of total uptake. Certified uptake accounts for less than 5% of uptake at Olam, Wilmar and Golden Agri.
- Nine out of 10 of companies have certified more than 80% of their refining facilities.
- There is a divide between upstream and downstream traceability and certification; traceability of supply to plantation of origin is 95% for upstream operations and 57% for downstream operations, while RSPO certified supply accounts for 58% of upstream FFB supply and 17% of downstream palm oil / palm oil product supply.

Figure 12: Quality of palm oil / palm oil product uptake

Company	Uptake of Palm Oil and Palm Oil Product		
	% Traceable to Plantation	% RSPO Certified	% Downstream Supply Chain Facilities RSPO Certified
Sime Darby	53%	62%	100%
Wilmar	24%	5%	84%
IOI Corporation	52%	21%	100%
Golden Agri	78%	4%	100%
Kuala Lumpur Kepong	57%	No data	88%
FGV Holdings	79%	14%	75%
Olam International	36%	2%	60%
Cargill	48%	29%	88%
Musim Mas	57%	7%	81%
First Resources	90%	7%	100%

Source: CDP, RSPO company reports

Physical Risk - palm oil

High sensitivity to climate change

Palm oil production is highly vulnerable to the impacts of climate change, posing a risk of further deforestation as production shifts to new areas. Oil palms grow best in the tropics, at temperatures between 24 - 33°C, with high rainfall (2000-2500mm) and ample sunlight. As a result, production is highly concentrated, with Malaysia and Indonesia accounting for over 80% of global palm oil production.⁽¹³⁾

Climate change is projected to decrease the total area suitable for palm oil production and reduce yields in many current regions of production. This is largely driven by changes in rainfall patterns and average temperature increases, as well as increasing frequency of extreme weather events such as floods, droughts and tropical storms. Research has shown that adverse weather patterns can already reduce palm oil yield in the 10 to 24 months following the event.

Some new areas are also predicted to become suitable for oil palm production, particularly areas further from the equator and at high elevation. However, this will not compensate for the overall loss of area suitable for production and will increase the risk of further deforestation, as many of these areas are also where remaining tropical forests are located. Oil palm plantations take around five years to become productive, from germinating seeds to fully grown oil palms. The time required to establish new oil palm plantations in response to the effects of climate change could therefore increase the instability of global production, unless the movement of palm oil production is well-managed.

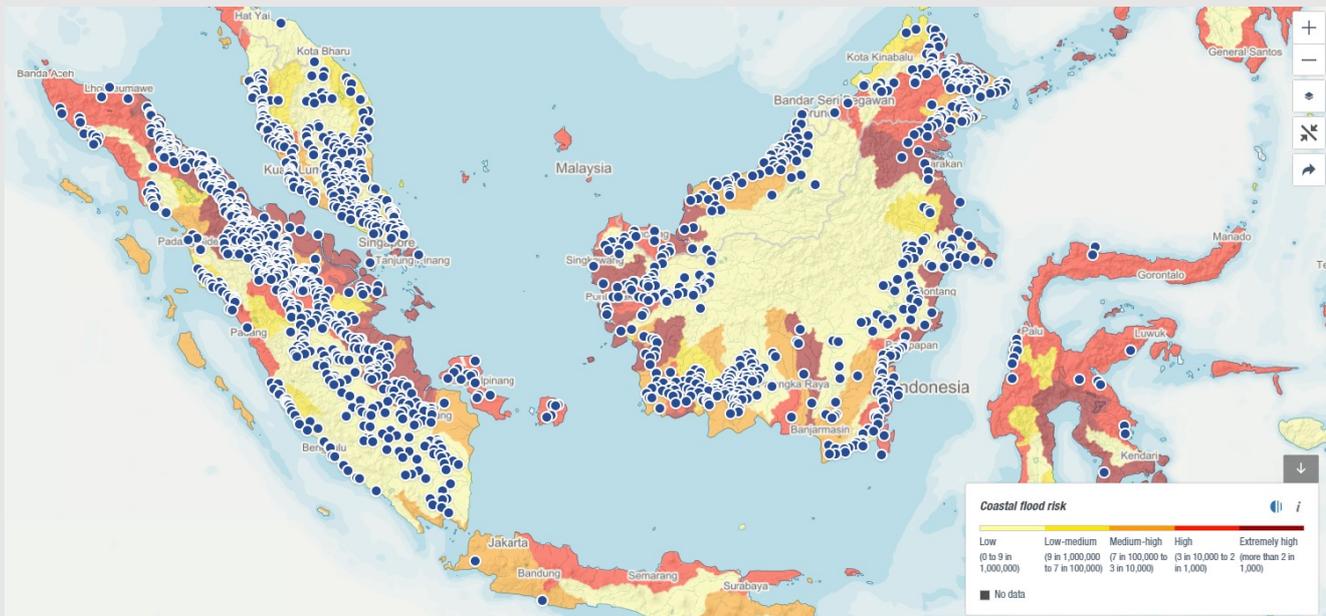
Concentrated production risks

The concentrated nature of palm oil production means that a significant proportion of global supply is exposed to the risk of climate change impacts. Some companies included in this report produce palm oil in just one area. To minimise climate change impacts and increase the security of supply, companies need to diversify the geographic spread of palm oil production beyond Southeast Asia.

The risk of supply chain concentration was highlighted at the start of 2020 when Malaysia announced its intention to shut down the majority of palm oil operations in an attempt to stem the spread of coronavirus. If implemented, this would have caused huge disruption to the manufacture of food and personal care and household goods products globally.

All the companies in this report publicly disclose palm oil mill lists but only six publicly disclose specific mill and plantation sourcing for each of their refineries.

Figure 13: Location of palm oil mills in Indonesia and Malaysia

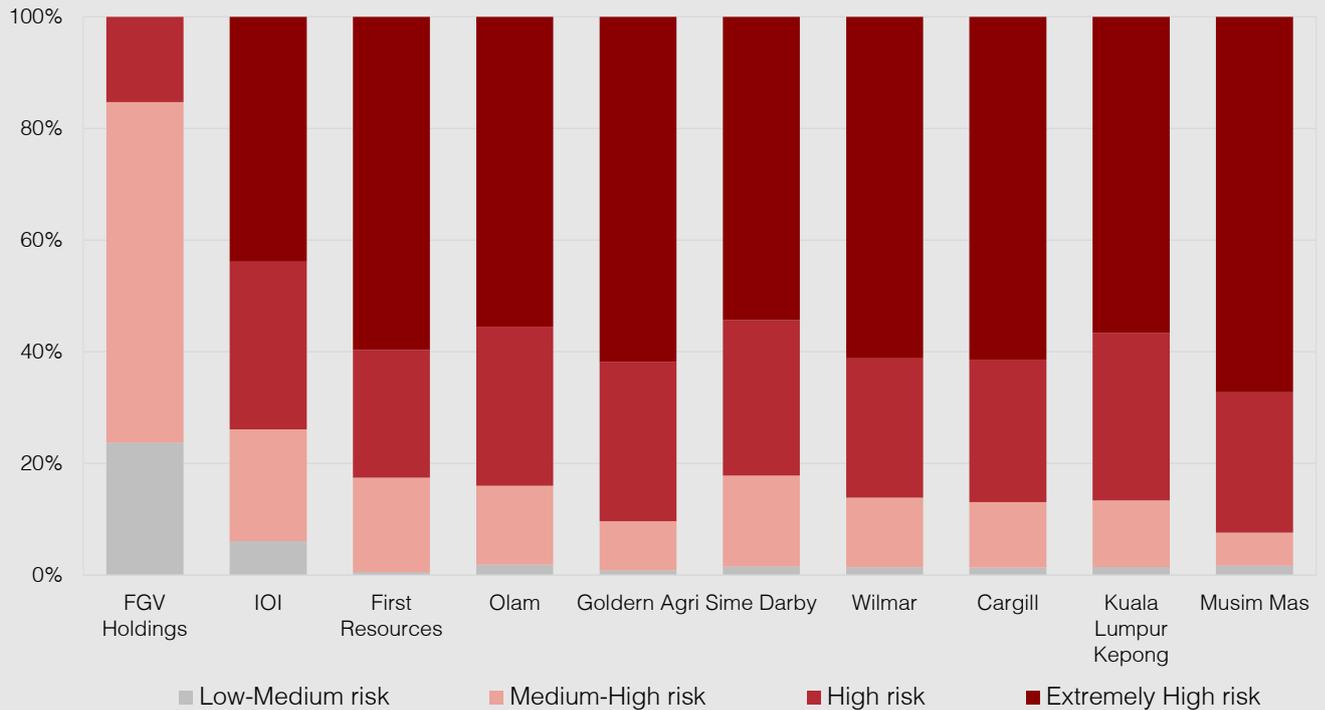


Source: CDP, WRI

13. Goh K.J., Chiu S.B., Paramanathan S, 2011, Climatic requirements of oil palm

Eight out of 10 companies are sourcing from areas of medium to high risk of drought. Oil palms require consistently high rainfall throughout the year and are highly sensitive to drought. Developing irrigation systems for palm oil could offset low and irregular rainfall caused by climate change. This will have to be managed sustainably so as not to decrease water availability for local communities and other local agricultural systems or ecosystems.

Figure 14: Company exposure to coastal flood risk



Source: CDP, WRI

Nine out of 10 companies covered are sourcing from areas of high risk of coastal flooding, as shown in Figure 14, with many mills and plantations in the region located on coastal flood plains. This poses a significant risk to palm oil supply and could trigger further deforestation if production is forced to move to forested upland areas.

Figure 15: Location of FGV Holdings mills and forest cover in Indonesia and Malaysia



Source: CDP, WRI, GFW

FGV Holdings sources mostly from areas of low-medium risk of coastal flooding, as shown in Figure 15, indicating that supply to the company is largely from upland areas with more intact forests.

Transition opportunities

- ▼ Musim Mas ranks first, with eight of its top 10 innovations considered to be radical or transformative. The company is involved in multiple landscape initiatives across Indonesia.
- ▼ Six companies have implemented landscape programmes that are transformative. These landscape approaches involve private and public sector partnerships, taking into consideration economic expectations, land use planning and community livelihoods.
- ▼ FGV Holdings rank last with no visible investment in multi-stakeholder landscape collaboration.

Overview

The transition to deforestation-free palm oil production requires transformational and systemic change to global food production systems. There is recognition that there is no single solution to the problem, and that there is a need to move away from a siloed market-based approach. There is also the recognition that not one single actor can make changes.

Advancement in modern agriculture has been at a cost to valuable ecosystems, and palm producers acknowledge the need to reduce the ecological impacts of palm plantations. Many are deploying sustainable agriculture practices that protect ecosystems at the micro-level of the plantation. Widely employed techniques are easy to scale and include the use of biological fertilisers and pesticides, zero-burning, replanting and biological waste compost. More advanced developments include programmes in soil health and restoration ecology.

Increasingly, forward-thinking companies have adopted sustainable agricultural practices beyond the confines of the farm, integrating systems-based landscape approaches that involve multi-stakeholder collaboration with governments, NGOs, local communities and other commercial actors. These macro-level strategic land use planning approaches are landscape specific, and whilst transformative, are harder to be deployed at scale.

Building on landscape, jurisdictional and verified sourcing area approaches seek to address systemic changes required for supply chain transformation. These approaches apply a range of programmes at sub-national levels to achieve improvements that lead to area-wide certification or verification, increasing market access for entire areas.

In this section, we explore sustainable innovation to demonstrate where companies are investing in radical and transformative solutions associated with step changes in sustainable palm oil production. A bespoke innovation matrix was developed from de Beer (2000) and Weterings (1997). Innovations are scored on an exponential scale and defined as incremental, evolutionary, radical and transformative, depending on their potential to improve the sustainability of oil palm production. Innovations are also assessed on their geographical spread and relative deforestation-risk, ranging from a single location to high risk regions and global coverage. Transition opportunities are assessed across the following metrics:

Metric 1) Sustainable innovation (75%): We compile a list of sustainable innovations for each company and assign each innovation two scores. The first assesses whether the innovation is incremental, evolutionary, radical or transformative. The second assigns the scale of each innovation from a single location to global distribution. We take the top 10 innovations for each company and combine the two scores to give a final innovation score out of 100.

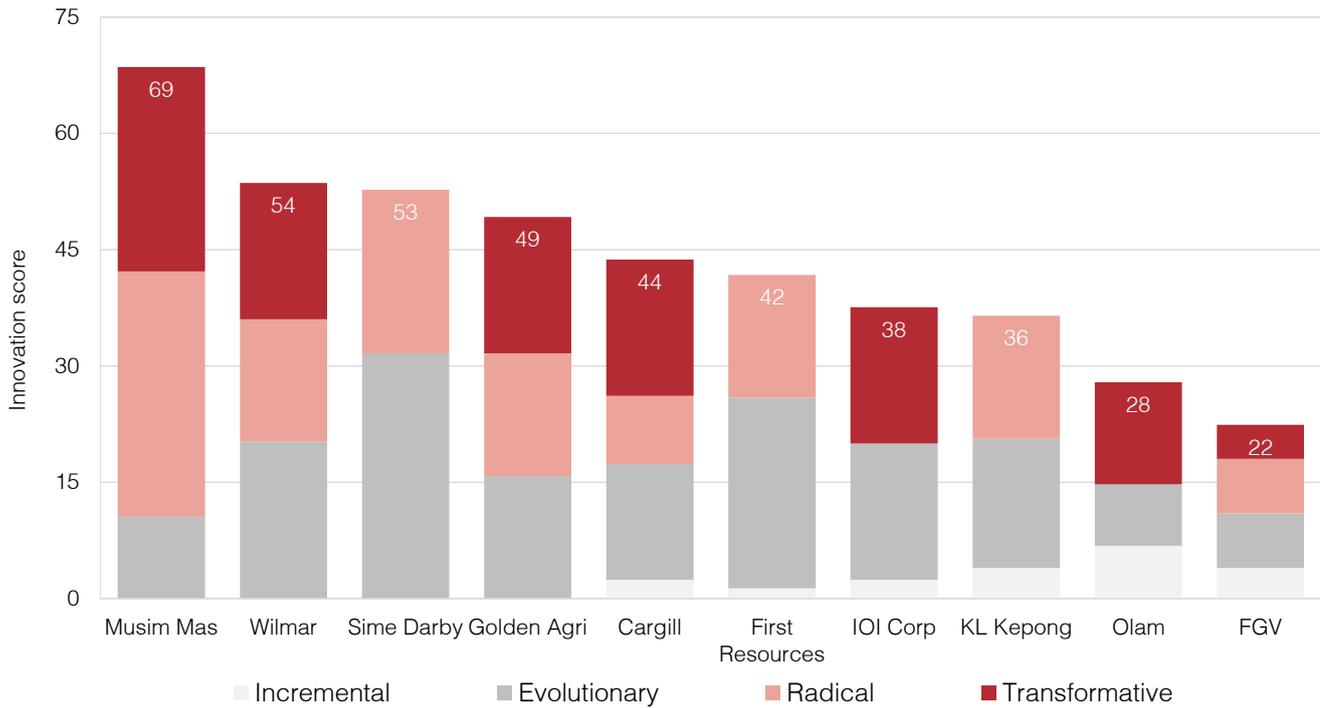
Metric 2) Capital resilience (25%): Companies with more resilient business models are more flexible to adapt to economic uncertainty, increased regulatory scrutiny and market uncertainty. These companies have the greater ability to drive market innovation and transformation in the face of changing customer trends and production models.

Figure 16: Transformative change theory

Innovation	Definition
Incremental	Improvements to existing palm oil production processes, providing marginal improvements to sustainability at the plantation level.
Evolutionary	Evolutionary innovations are a continuation of the existing improvement trend with the integration of more comprehensive biodiversity conservation techniques and improvements to productivity.
Radical	Radical innovations are discontinuous events that change the key parameters of existing sustainable palm oil production and will have a significant impact on reducing deforestation. This includes more comprehensive smallholder engagement and real-time supply chain monitoring.
Transformative	Transformative innovations require a fundamental change in palm oil production and will take a landscape approach to drive sustainable agriculture at scale.

Source: CDP, Weterings (1997), de Beer (2000)

Figure 19: Sustainable innovation score and degree of innovation



Source: CDP, company reports

Landscape approach for lasting transformation in and around the world-famous Leuser Ecosystem

The Leuser Ecosystem is one of the most biodiverse ecosystems on Earth and the only place where the Sumatran elephant, orang-utan, rhino and tiger are still found together. It provides many important ecosystem services including protection from drought and flooding, and its valuable peatlands act as one of the largest carbon sinks on Earth, making it vital to climate change efforts.

Oil palm plantations, mills and farming communities adjacent to the Leuser put significant pressure on the surrounding forests and farmers in neighbouring Aceh Tamiang district are among the poorest in the nation facing issues with high living costs, low palm oil prices and low yield from their oil palm trees.

Since 2016, the Earthworm Foundation has been partnering with FMCG and commodity producers on creating on-the-ground changes in Aceh Tamiang with the aim of mitigating the negative impacts of palm oil production and providing long-term positive impacts from more responsible production.

Efforts to mitigate the negative impacts of palm oil production have included the development of a formal partnership with local government focused on integrated spatial planning, provision of support to local communities to build sustainable sources of income that can alleviate pressures on the forest, guidance of NDPE techniques to local mills and plantations and conservation of remaining forest areas.

There have been early indications of the success of the multi-collaborative landscape approach at Aceh Tamiang and Starling satellite monitoring of Aceh Tamiang in Q2 2019 revealed a 95% drop in deforestation when compared with 2018, and a 96% drop compared with 2017.

Awareness of forest protection has played a significant role in driving behavioural change within the local government and formal commitments have now been made on the land use planning and sustainable development, resulting in a district-wide moratorium on all new palm oil licenses.

Other programme impacts to date include a forest protection agreement covering 12 palm oil concessions and 2 mills with 1,400 hectares of HCV/HCS forest mapped and protected and community empowerment programmes directly impacting the livelihoods of 2,095 households in 5 forest-frontier villages.

Figure 20: Sustainable innovation highlights

Company	Description	Score	Rank
Musim Mas	<ul style="list-style-type: none"> The Government of Aceh Tamiang District together with Unilever, Musim Mas and PepsiCo are exploring opportunities to increase sustainable palm oil production while protecting the Leuser Ecosystem Collaborating to implement a landscape programme for sustainable palm oil in Siak and Pelalawan (Cargill, Danone, Golden Agri-Resources, Musim Mas, Neste, PepsiCo and Unilever). Actively supporting the Aceh Tamiang landscape work with TFT and other growers. 	69	1
Wilmar	<ul style="list-style-type: none"> Part of the Sabah Jurisdictional Certification Steering Committee (JCSC), which aims to help the Sabah government to achieve its vision of producing 100% RSPO certified sustainable palm oil by 2025. 	54	2
Sime Darby	<ul style="list-style-type: none"> SDP employs best management practices such as water management, maintenance of existing vegetation in and adjacent to plantations and community engagement, aimed at minimising the risk of peat fires. Coalition of 10 major palm oil producers and buyers to support and fund the development of a new, publicly available radar-based forest monitoring system known as Radar Alerts for Detecting Deforestation (RADD). 	53	3
Golden Agri	<ul style="list-style-type: none"> Collaborating to implement a landscape programme for sustainable palm oil in Siak and Pelalawan (Cargill, Danone, Golden Agri-Resources, Musim Mas, Neste, PepsiCo and Unilever). Collaboration with Earthworm Foundation Programme on integrated land use planning with government, NDPE support and training for industry, and intensive capacity-building for communities in Aceh Tamiang. 	49	4
Cargill	<ul style="list-style-type: none"> Collaborating to implement a landscape programme for sustainable palm oil in Siak and Pelalawan (Cargill, Danone, Golden Agri-Resources, Musim Mas, Neste, PepsiCo and Unilever). Working with the government in Musi Banyuasin, South Sumatra and IDH to develop a Verified Sourcing Area (VSA) landscape program to certify that all produce generated from VSA areas meets stringent guidelines. 	44	5
First Resources	<ul style="list-style-type: none"> For existing plantations on peat, company implements best management practices such as ensuring groundwater levels are maintained at optimal levels to minimise subsidence and the release of CO₂. Soil management practices aimed at maintaining and enhancing soil fertility and reducing risks of soil degradation posed by plantation activities through minimal use of inorganic fertilisers. 	42	6
IOI Corp	<ul style="list-style-type: none"> Launched the South Ketapang Landscape Initiative in partnership with Aidenvironment Asia and GEC to develop a collaborative way to handle critical issues within the ecologically diverse South Ketapang landscape. Bukit Leelau Mini Landscape Level Project is a multi-stakeholder partnership consisting of IOI, NGOs, the local communities of the adjacent areas, Pahang forestry Department, JAKOA and other local and state officers. 	38	7
Kuala Lumpur Kepong	<ul style="list-style-type: none"> Apply best management practices to peatland that exists within its plantations, introducing additional holistic practices on peatlands protection such as periodical monitoring of water table level. Have equipped the Indonesian estates with fire fighting teams, strict patrolling system which include setting up of fire towers to inform ground patrol of any occurrence of fire. 	36	8
Olam	<ul style="list-style-type: none"> Landscape conservation approach implemented with the Gabonese government ensures a balanced ratio between production and conservation based on scientific results. In company and third-party supply chains (where feasible) the company focuses on regenerative soil management techniques and compost training to restore degraded land. 	28	9
FGV	<ul style="list-style-type: none"> FGV continues to work closely with our value chain partners to ensure that traceability and transparency are embedded in their own practices. FGV signed a MOU with Newlight Technologies LLC and Innogas Technologies Sdn Bhd (Innogas Technologies) for a project to produce biodegradable plastics from palm oil biomass waste in Malaysia. 	22	10

Source: CDP, company reports

Capital flexibility highlights

Golden Agri, Olam and Wilmar have a high degree of debt and operate with very high levels of leverage of more than 4x net debt /EBITDA, indicating a lower ability to take on additional debt required to invest in innovation.

FGV Holdings, First Resources and Olam convert a very small amount of their net income into free cash flow, another indication of the lower flexibility to invest in the business.

Figure 21: Company leverage and cash conversion

Company	Net Debt/EBITDA FY 2019
First Resources	1.60
KL Kepong	1.88
IOI Corp	1.88
FGV	3.57
Sime Darby	3.66
Golden Agri	4.88
Olam	5.28
Wilmar	6.10

Source: CDP, company reports

Company	Free cash flow conversion
FGV	-4.62
First Resources	0.13
Olam	0.18
Golden Agri	0.46
IOI Corp	0.77
Sime Darby	0.84
KL Kepong	1.02
Wilmar	1.29

Source: CDP, company reports

Deforestation governance & strategy

- ▼ Palm oil companies have made strong policy commitments, facilitated by comprehensive guidelines provided by the RSPO. Nine companies have committed to zero deforestation in their supply chains and one company to zero net deforestation.
- ▼ Wilmar International leads the group, followed by Golden Agri-Resources.
- ▼ First Resources ranks last with weaker sustainable production policy commitments compared to its peers and limited evidence of strong governance of forest-related issues.

Overview

Investors are becoming increasingly aware of the financial risks associated with deforestation, amplifying calls from civil society and global businesses for companies producing and trading palm oil to take action to eliminate deforestation from their supply chains.

Companies with robust governance of forest-related supply chain risks will be best positioned to capitalize on the shift to zero deforestation supply chains. Implementing strong palm oil-specific policies setting out companies' 'No Deforestation, No Peat and No Exploitation' (NDPE) commitments and expectations for suppliers is crucial for companies to demonstrate commitment to minimising deforestation risk exposure. Recognising forests' vital role in mitigating climate change, providing ecosystem services and supporting biodiversity, as well as their importance to indigenous and local community livelihoods, policy commitments should go beyond deforestation to cover a broad range of environmental and social aspects critical to a sustainable palm oil supply chain.

Ensuring oversight of forest-related risks at board and executive levels and establishing robust risk management processes is imperative if companies are to demonstrate their readiness and commitment to achieving deforestation-free, sustainable supply chains.

Many companies have set traceability and certification targets to quantify progress on sustainable production.

However, stronger action is needed – particularly around companies' oversight and engagement with indirect suppliers – if companies are to signal to investors that they are committed to bringing about systemic changes in agricultural practices.

In this chapter we assess companies on their deforestation governance and strategy using four key metrics:

Metric 1) Policy commitments & memberships (40%): Companies are assessed on the strength of commitments to address deforestation and promote sustainable production in their commodity-specific policies and public disclosures, as well as their support for key sustainability initiatives.

Metric 2) Board & executive level management (30%): Companies are assessed on a number of factors relating to board and executive deforestation responsibility performance, including the level of directors on the board with sustainability experience, the presence of sustainability-related committees at board and/or executive levels, and the overall quality of commodity-specific forest risk management systems.

Metric 3) Targets (20%): This metric aims to evaluate the strength of companies' deforestation-related targets.

Metric 4) CDP Forest ranking (10%): Companies are assessed according to their CDP Forests 2019 score. The CDP Score provides an aggregate measure of the quality of forest-related disclosure and management systems addressing forest-related risks.

Figure 22: Deforestation governance & strategy summary

Company	Policy commitments & memberships	Board & executive level management	Targets	CDP Forest score (2019)	Overall weighted rank	Deforestation governance & strategy rank
Wilmar	1	5	2	B-	2.6	1
Golden Agri	2	4	3	A-	2.7	2
Musim Mas	5	7	1	B	3.2	3
Olam International	6	2	7	B	3.4	4
Sime Darby	3	6	4	C	3.4	5
IOI Corporation	7	3	5	B-	4.4	6
Cargill	4	9	9	D	5.1	7
FGV Holdings	8	1	8	F	5.3	8
Kuala Lumpur Kepong	9	8	10	F	7.9	9
First Resources	10	10	6	F	9.2	10
Weighting	40%	30%	20%	10%		

Note: In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks in this summary for simplicity only.

Source: CDP

Policy commitments and membership highlights

- Companies' policy commitments around sustainable production are strong, facilitated by comprehensive guidelines provided by the RSPO. Nine companies have committed to zero deforestation in their supply chains and one company – Olam International – zero net deforestation.
- All company policies include key issues typically covered in NDPE commitments (see Figure 23), including no conversion of High Conservation Value (HCV) or High Carbon Stock (HCS) areas, no new development on peatland, and respecting the rights of indigenous peoples and local communities.
- The strength of companies' commitments shows greater variation in terms of broader environmental issues such as biodiversity conservation, responsible water use, and protecting water quality.
- Wilmar International leads the group, ranking top in terms of sustainable production policy commitments (see Figure 23). In addition to its NDPE commitment, the company also scores highly for other environmental aspects such as responsible water use and protecting water quality.
- Golden Agri-Resources ranks second, performing well in terms of policy commitments while also being a member of several palm oil related sustainability initiatives, including the High Carbon Stock Approach Steering Group and HCV Resource Network (Figure 24).
- First Resources ranks last. Although the company's palm oil policy aligns with NDPE practices, provisions for broader environmental protection in the supply chain are weaker than its peer group, while the company is not a member of several key palm oil related sustainability initiatives.

Figure 23: Sub-set of environmental and social policy criteria evaluated

Palm oil specific policy commitments	Wilmar	Golden Agri	Sime Darby	Cargill	Musim Mas	Olam	IOI Corp	FGV Holdings	KL Kepong	First Resources
Environmental										
Commodity-specific policy	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Zero deforestation / zero net deforestation	Green	Green	Green	Green	Green	Light Green	Green	Green	Green	Green
No conversion of high conservation value areas	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
No conversion of high carbon stock areas	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
No planting on peat	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Zero burning	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Biodiversity conservation	Light Green	Green	Light Green	Green	Light Green	Green	Light Green	Green	Green	Light Green
Improve water use intensity & quality	Green	Yellow	Light Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Social										
Respect indigenous and local communities' rights	Green	Green	Green	Green	Green	Green	Green	Green	Light Green	Light Green
Secure Free, Prior and Informed Consent (FPIC)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
UN Declaration of Human Rights / UN Guiding Principles on Business and Human Rights	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
UN International Labour Organization principles	Green	Light Green	Green	Green	Green	Green	Green	Green	Green	Yellow

Source: CDP, company reports

Clear commitment in commodity-specific policy; applies to own operations and procurement	Green
Evidence of commitment directly relating to commodity production; applies to own operations and procurement	Light Green
Commitment applies to either own operations or procurement only / included in wider company policies	Yellow
Not included within commodity-specific policy; no direct link to commodity	Red

Figure 24: Palm oil memberships⁽ⁱ⁾

Company	UNGC	WBCSD	Tropical Forest Alliance	New York Declaration on Forests	High Carbon Stock Approach Steering Group	HCV Resource Network	Fire-Free Alliance	PONGO Alliance
Cargill	✓	✓	✓	✓	✓	✗	✗	✗
FGV Holdings	✗	✗	✗	✗	✗	✗	✗	✗
First Resources	✗	✗	✗	✗	✗	✗	✗	✗
Golden Agri	✓	✓	✓	✓	✓	✓	✗	✗
IOI Corporation	✗	✗	✗	✗	✓	✗	✓	✗
KL Kepong	✗	✗	✗	✗	✓	✗	✗	✗
PT Musim Mas	✗	✗	✓	✓	✓	✗	✓	✓
Olam International	✓	✓	✓	✗	✗	✓	✗	✗
Sime Darby	✗	✗	✓	✓	✗	✓	✓	✓
Wilmar	✓	✗	✓	✓	✗	✗	✓	✓

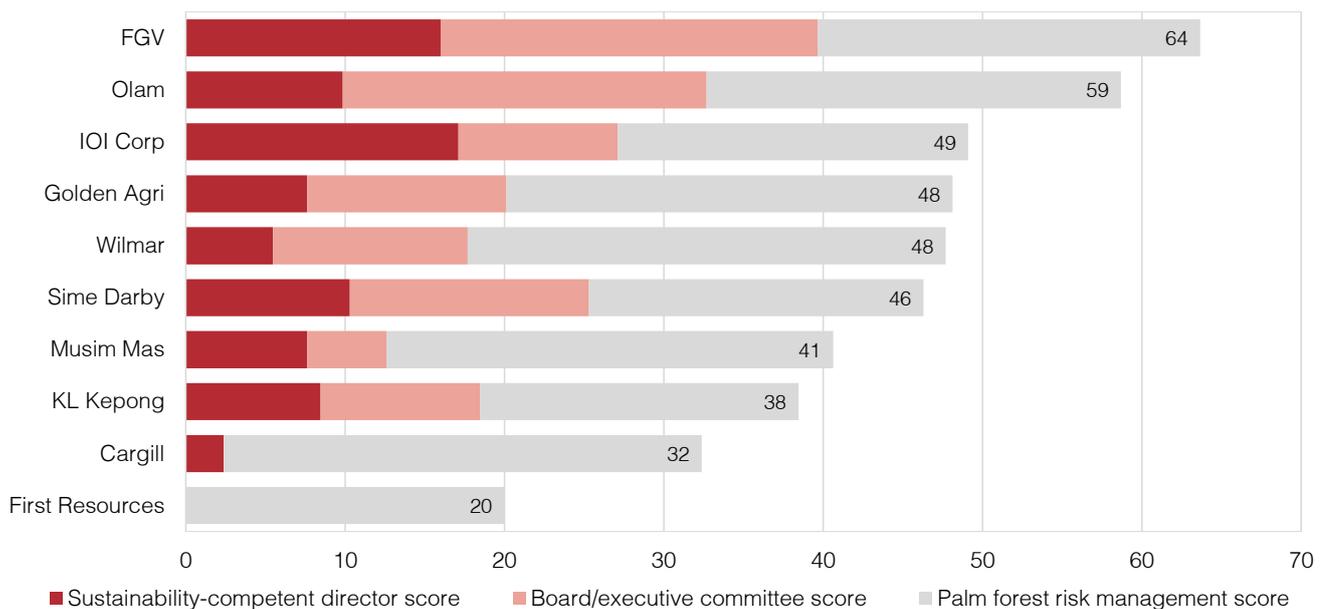
(i) Companies are displayed in alphabetical order. Company scores for memberships are included in overall scores for the Policy commitments & memberships metric.

Source: CDP, company reports

Board & executive level management highlights

- ▼ FGV Holdings leads the group (see Figure 25). Five of the company's nine board members were assessed as having sustainability expertise, including two former members of the Malaysian Palm Oil Board and one with ministerial experience in agriculture. The company is also one of just two companies that have a committee responsible for sustainability issues at both board and executive levels. The other is Olam.
- ▼ First Resources rank last overall, with no evidence of a sustainability committee at either board or executive level and performing lowest in terms of director experience and forest-risk management procedures.
- ▼ Board-level sustainability expertise is relatively low across the group: 40% of all directors were assessed as having sustainability experience, of which 66% were deemed to have low (24%) or very low (42%) levels of expertise.

Figure 25: Board level expertise and management

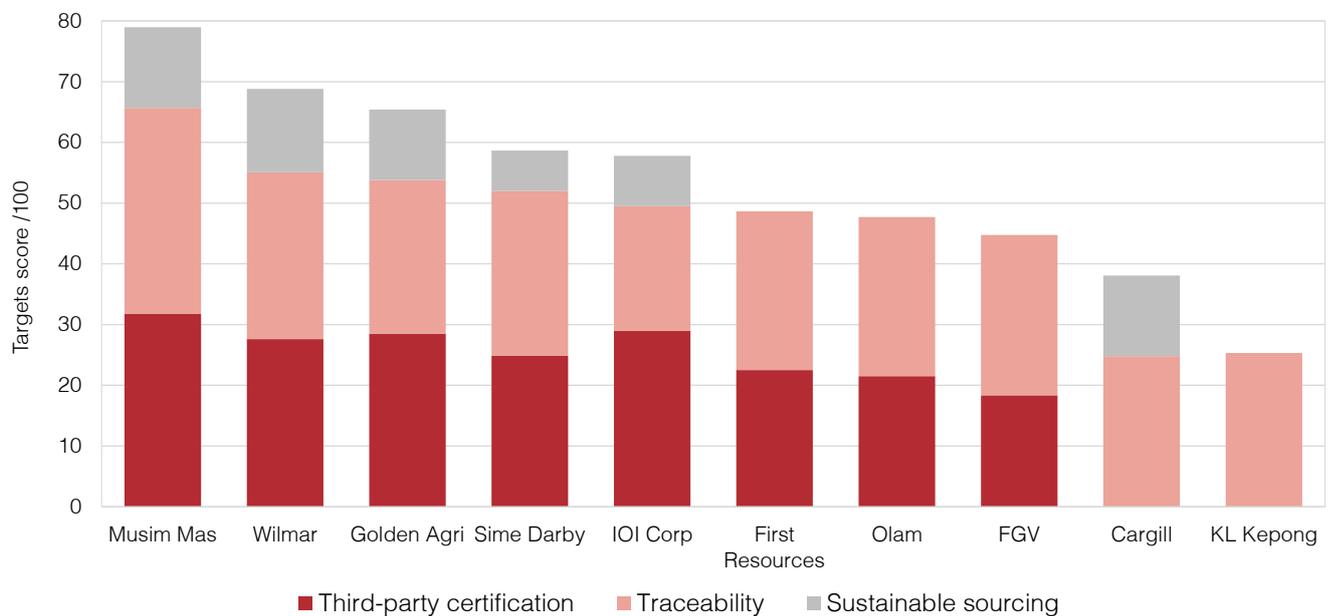


Source: CDP, company reports

Targets highlights

- ▼ Eight companies have timebound targets relating to third party certification, while all companies have targets covering traceability of palm oil to plantation or mill of origin (see Figure 26). However, 22% of targets for certification and traceability are more than 50% short of delivery, while just over 40% of targets relate to companies' direct operations only.
- ▼ Six companies have also set targets for sustainable sourcing, which includes assessing supply chain compliance with companies' NDPE commitments and supporting the inclusion of smallholders and their compliance with sustainability standards.
- ▼ PT Musim Mas ranks top. The company is targeting full supply chain traceability to plantation by 2025, while also aiming for 100% third party certification for own operations and associated scheme smallholders by 2022.
- ▼ Kuala Lumpur Kepong ranks last. While the company has targets for traceability to plantation for the company's own mills and refineries, there is no evidence the company has set targets for certification nor sustainable sourcing.

Figure 26: Palm oil deforestation-related target score



Source: CDP, company reports

Timber

Transition risk

- ▼ Certification uptake is widespread, raising the baseline for sustainable timber production across the board. An average of 73% of timber production is certified to FSC or PEFC standards across the eight companies.
- ▼ Empresas CMPC, Suzano and Asia Pulp & Paper rank in the top three. All three companies have over 70% of their total timber production certified to FSC or PEFC standards.
- ▼ International Paper ranks last, with only 38% of its total timber supply certified to FSC or PEFC standards, the lowest level in the group.

Overview

Forestry accounted for approximately 15% of commodity-driven deforestation from 2005 - 2015.⁽²⁾ Global demand for forestry products is set to grow, increasing the risk of deforestation if production is not sustainably managed.

Whilst a relatively small proportion of global timber products are sourced from tropical forests, logging is still a major driver of deforestation in Central and South America and Southeast Asia. Timber cleared from tropical forests often funds the establishment of agribusiness operations, such as oil palm plantations and soy or cattle farms. Deforestation risk in the tropics is set to grow, driven by increasing demand for timber products, ideal climatic conditions for fast growing trees and lower production costs.

Global timber product supply chains are complex and fragmented and timber often grows in remote areas, far from law enforcement. This makes wood relatively easy to launder, creating a huge illegal market, worth an estimated US\$15 billion,⁽¹⁴⁾ with around one third of tropical timber on the global market sourced illegally.⁽¹⁵⁾ Increasingly regulation is being introduced requiring companies to prove the legality of their timber, including the European Union Timber Regulation, The Lacey Act in the USA, Japan's Clean Wood Act and Australia's Illegal Logging Prohibition Act.

Voluntary third-party certification has emerged as one way to improve the sustainability of forestry and over 430 million ha of forest are certified to FSC and/or PEFC standards globally.⁽¹⁶⁾ However, only 2% of tropical forests are certified,⁽¹⁷⁾ showing the world's most valuable forest ecosystems are still at risk. Whilst certification does not solve unsustainable forest management, it does provide a framework to improve supply chain traceability and hold companies accountable for maintaining minimum standards for sustainable production.

Timber companies who are engaged in certification and source more of their timber from land they directly own are more likely to have better supply chain transparency and more control of the sustainability of production. These firms are therefore more likely to be able to respond to increased regulation and manage deforestation risk.

Transition risks are assessed using the following metrics:

Metric 1) Land Use (40%): This metric assesses the total area of land companies own as well as the proportion of this classified as productive forest land and the proportion set aside for conservation.

Metric 2) Traceability, Certification and Procurement (60%): This metric evaluates the proportion of timber supply that companies source from forest and plantations they own or lease long-term and the proportion of timber supply that meets third party sustainability certifications.

Figure 27: Transition risks summary

Company	Land use	Traceability, certification and procurement	Overall weighted rank	Transition risks rank
Empresas CMPC	6	1	3.1	1
Suzano	1	3	3.4	2
Asia Pulp & Paper	3	2	3.5	3
Weyerhaeuser	2	5	4.5	4
Mondi Plc	4	4	4.5	5
Stora Enso	5	6	5.2	6
UPM	7	7	5.8	7
International Paper	8	8	8.0	8
Weighting	40%	60%		

Note: In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks in this summary for simplicity only.

Source: CDP

14. World Bank, 2012, Justice for forests : improving criminal justice efforts to combat illegal logging

15. Centre for International Forestry Research, 2019, Annual Report 2018: Forests matter

16. PEFC, 2020, Facts and Figures

17. UNECE/FAO, 2012, Forest Products Annual Market Review 2011-2012

Land use highlights

Companies that own or lease larger areas of land are more likely to be able to directly manage deforestation risks. Companies should also balance creating larger conservation set asides to manage biodiversity and ecosystem services, whilst maintaining the rest of their land as productive forest area.

- ▼ Suzano ranks top for this metric overall, with 39% of its land set aside for conservation, the highest proportion among the group.
- ▼ Weyerhaeuser ranks second, with over 25 million hectares (ha) of land owned or under long-term lease across North America, by far the largest within the sample.
- ▼ International Paper comes last, with the smallest area of land owned or under long-term lease at 747,000 ha, and only reporting 0.4% of this as set aside for conservation.
- ▼ Generally, companies with a larger proportion of their land set aside for conservation purposes have a higher proportion of their timber supply produced to sustainable standards, as shown in Figure 28. FSC and PEFC standards both include guidelines around minimum conservation set aside areas and how they should be managed.
- ▼ The proportion of land classified as productive forest varies widely across the sample, with UPM performing best with 75% land classified as productive forest, whilst Suzano has the lowest productive forest area at 44%.
- ▼ The proportion of conservation set-asides varies considerably across the sample, ranging from 0.4% - 39%. Conservation set-asides are important for improving biodiversity and allowing the flow of ecosystem services and wildlife. This improves forests' productivity and ability to adapt to and mitigate climate change.
- ▼ Collectively the companies in our sample own or long-term lease over 38 million ha of land, with over 8.3 million ha set aside for conservation. This provides a huge opportunity to implement sustainable practices that minimize the environmental impact of forestry and enhance biodiversity and ecosystem services at scale.

Figure 28: Conservation set aside (%) vs. total certified production (%)



Bubble size: Total area of land owned and leased

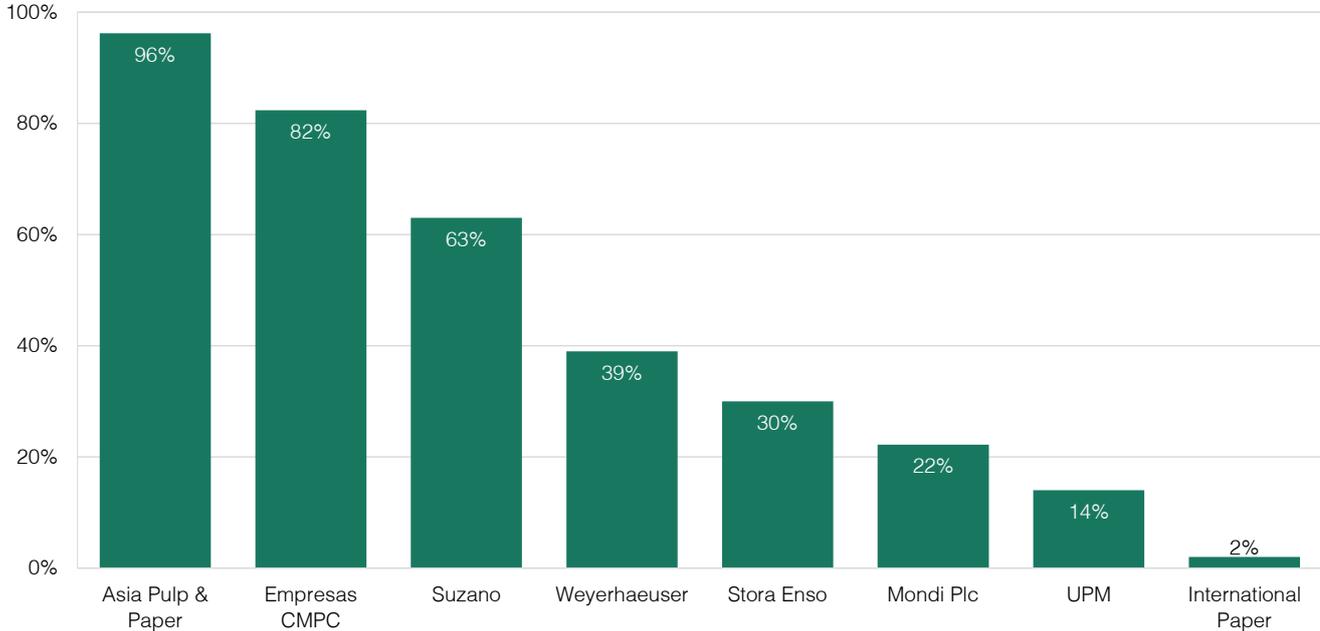
Source: CDP, company reports

Traceability, certification and procurement highlights

Companies using FSC and PEFC third-party sustainability standards to certify more of their timber supply are better able to manage deforestation risks and improve the overall sustainability of timber production. At the same time, companies sourcing larger proportions of timber from land they directly control are more likely to be able to directly manage deforestation risk and sustainably manage their forests.

- ▼ All timber companies within our sample use at least one type of third-party certification to verify the sustainability of their timber supply. Across the group, an average of 73% of timber production is certified to FSC or PEFC standards, whilst 18% meets FSC or PEFC Controlled Wood standards. Generally, minimum standards for sustainable timber production are high and certification helps to hold companies accountable for maintaining and improving this. However, companies must go beyond certification to end deforestation.
- ▼ Companies have higher levels of certification for timber produced on land they own or lease long-term than for timber procured externally. On average, 97% of timber produced on land that these companies own or lease long-term is certified to FSC or PEFC standards, whilst the figure is 45% for externally procured timber. Engaging suppliers in certification will be key to tackling deforestation and improving the sustainability of timber production.
- ▼ Across the eight companies, an average of 44% of timber supply is sourced from forests and plantations they own or lease long-term. This provides more opportunities to directly manage deforestation risk.
- ▼ Empresas CMPC ranks first for this metric, with 93% of its total timber supply certified to FSC or PEFC standards and sourcing 83% of its timber from land it owns or leases long-term.
- ▼ Asia Pulp & Paper ranks second. 88% of its total timber supply is certified to PEFC standards and it sources 96% of its timber from land it owns or leases long-term.
- ▼ International Paper ranks last for this metric, with only 38% of its total timber supply certified to FSC or PEFC standards, the lowest level of certification among the group.

Figure 29: Total own grown timber supply (%)



Source: CDP, company reports

Figure 30: Timber certification

Company	FSC	PEFC	Total Certified Wood %	Total Controlled Wood %	% Own grown timber certified	% externally procured timber certified grown	% externally procured certified Controlled Wood	Rank
Empresas CMPC	✓	✓	93%	4%	96%	79%	21%	1
Mondi Plc	✓	✓	72%	28%	100%	65%	35%	2
Suzano	✓	✓	71%	29%	87%	44%	56%	3
Asia Pulp & Paper	✗	✓	88%	0%	91%	3%	0%	4
UPM	✓	✓	82%	18%	100%	No data	No data	5
Weyerhaeuser	✗	✓	65%	0%	100%	43%	0%	6
Stora Enso	✓	✓	75%	0%	98%	No data	No data	7
International Paper	✓	✓	38%	62%	100%	36%	64%	8

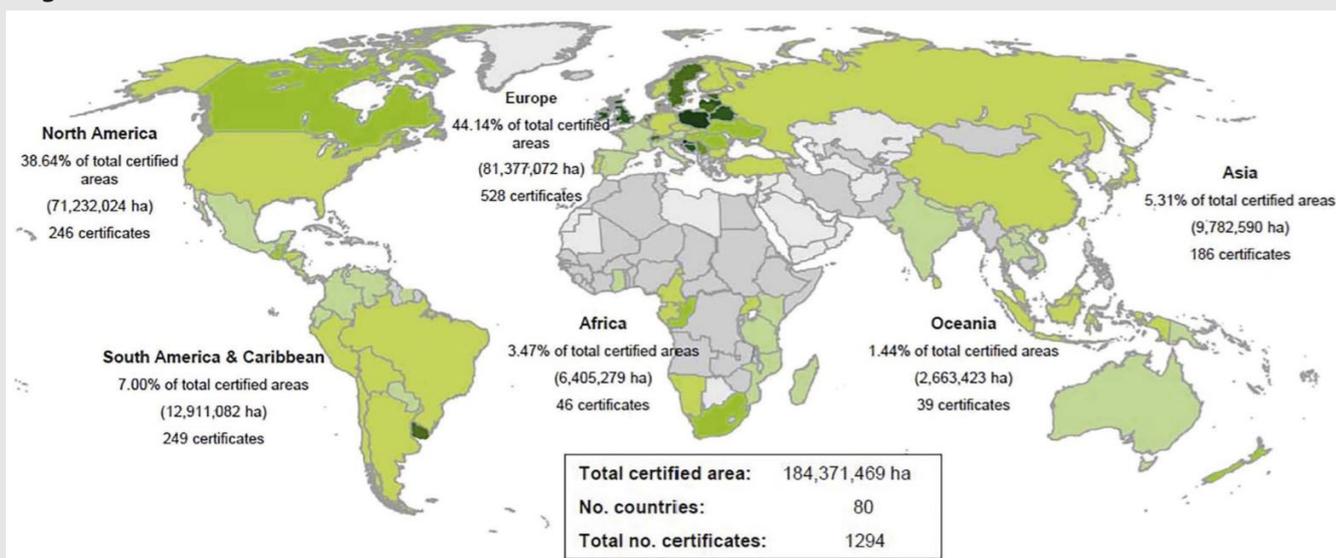
Source: CDP, company reports

Timber certification: getting to the root of deforestation?

For many producers and forestry companies, voluntary third-party certification standards are the first point of engagement on deforestation and sustainable production issues. There are two main forest certification schemes: the multi-sectoral Forest Stewardship Council (FSC) and the industry-driven Programme for the Endorsement of Forest Certification (PEFC). Broadly, PEFC favours business interests over social and environmental ones and national standards over global principals, with less focus on labour and indigenous rights and broader environmental impacts than FSC. However, both FSC and PEFC have faced criticism for failing to make a real impact on sustainable forest management and deforestation.

There is no real measure of the direct impact of certification on deforestation and other social and environmental issues, even though FSC and PEFC both restrict natural forest conversion. This is partly because both certification standards have changed over time and standardised impact data across certifications is lacking. In addition, market penetration of certified forestry products remains relatively low. FSC certified wood makes up an estimated 8% of global supply and certification uptake is extremely limited in tropical forest frontiers, where it would have the biggest impact on deforestation. These areas are dominated by informal economies which are often also the source of illegal “conversion timber”, used to fund the production of other commodities once forested land has been cleared.

Figure 31: Total FSC and PEFC certified areas



Source: Kraxner et al., 2017, mapping certified forests for sustainable management

Links between conversion timber and agribusiness highlight the need for a systematic approach that goes beyond certification to tackle deforestation. Greater collaboration across sectors to develop sustainable land use across landscapes and standardise data collection for environmental impacts are needed. Stronger public policy could also incentivise companies and smaller scale producers to shift to more sustainable agriculture and forestry practices, whilst regulating the informal economies that undermine legal, certified timber. Some of the largest timber companies are supporting their supplier to become certified and increasing certification in the areas most at risk of deforestation will be key to developing more sustainable markets for forest products.

Transition opportunities

- Timber companies are in a unique position to be able to improve forests' biodiversity and ecosystem service provision whilst contributing to the circular economy. However, systematic change is needed to achieve sustainable forestry at scale.
- UPM ranks first with a range of circular economy and sustainable forestry innovations aimed at increasing biodiversity, climate change adaptation and reducing the impact of harvesting in its forests.
- Weyerhaeuser ranks last and was the only company not demonstrating any circular economy innovations.

Overview

With increasing pressure from international regulation and consumer goods companies around the legality and sustainability of timber sourcing, timber companies need to develop transformative systematic innovations to improve the sustainability of forestry at scale.

Sustainable innovations in timber production take a number of forms. Basic initiatives to improve the sustainability of forestry operations include conservation set-asides and improvements to productivity. However, companies need to move beyond this to develop forests that can adapt to climate change and sustainably meet rising demand for timber products. The more innovative companies are developing forestry practices that mimic natural forest landscapes, with some advanced initiatives engaging local communities in agroforestry to produce other agricultural products within forests. Forward-looking companies are also engaging more proactively in forest governance, tackling issues such as illegal logging and forest loss through slash-and-burn agriculture.

The forestry sector is also in a unique position to contribute to growing circular and bio-economy products and services. This includes, using timber processing waste streams to create novel low-carbon, renewable materials which can replace fossil fuels, such as bioplastics. Waste streams from timber production can also be used to improve soil quality for forestry and agriculture.

Bringing these innovations to scale will be key to ensuring the sustainability of commercial forestry and the ecosystems and communities it impacts and contribute to a more sustainable circular economy.

In this section, we explore sustainable innovation to demonstrate where companies are investing in radical and transformative solutions associated with step changes in sustainable timber production and circular economy products and services. A bespoke innovation matrix was developed from de Beer (2000) and Weterings (1997). Innovations are scored on an exponential scale and defined as incremental, evolutionary, radical and transformative, depending on their potential to improve the sustainability of timber production and create circular economy products and services. Innovations are also assessed on their geographical spread and relative deforestation-risk, ranging from a single location in a low deforestation-risk area, to high deforestation risk countries and regions and global coverage.

Transition opportunities are assessed across the following metrics:

Metric 1) Sustainable innovation (75%): We compile a list of sustainable innovations for each company and assign each innovation two scores. The first assesses whether the innovation is incremental, evolutionary, radical or transformative. The second assigns the scale of each innovation from a single location to global distribution. We take the top 10 innovations for each company and combine the two scores to give a final innovation score out of 100.

Metric 2) Capital resilience (25%): Companies with more resilient business models are more flexible to adapt to economic uncertainty, increased regulatory scrutiny and market uncertainty. These companies have the greater ability to drive market innovation and transformation in the face of changing customer trends and production models.

Figure 32: Transformative change theory

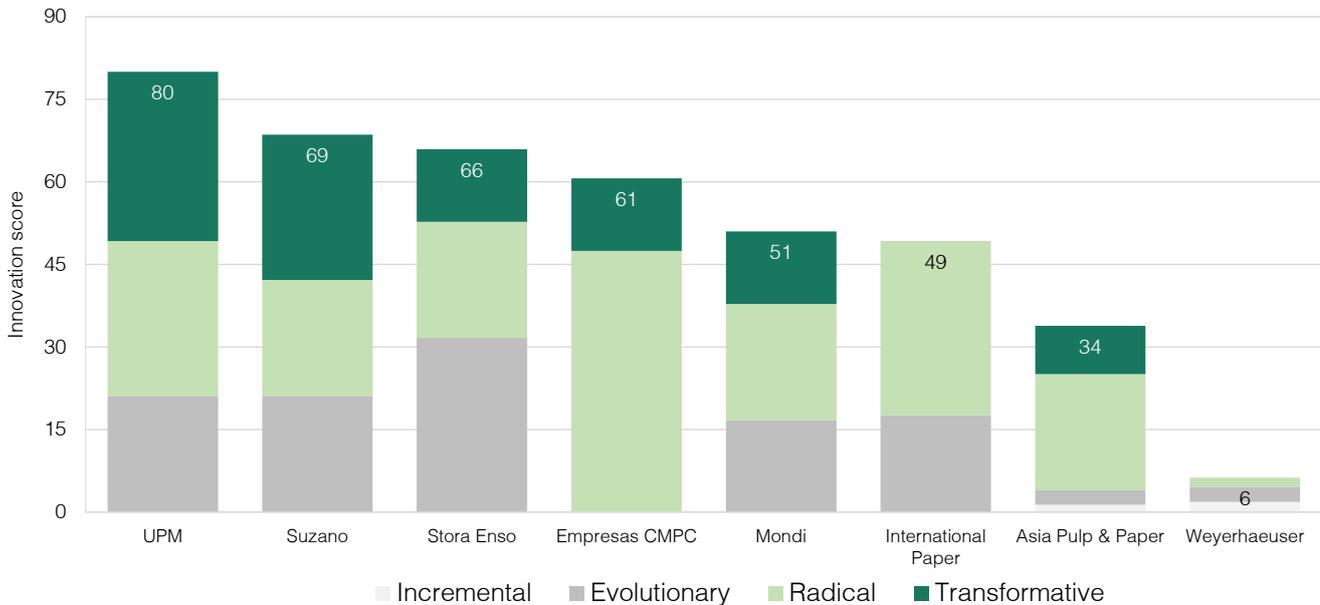
Innovation	Definition
Incremental	Improvements to existing products or forest management processes, providing marginal improvements to the sustainability of forestry production and products.
Evolutionary	Evolutionary innovations are a continuation of the existing improvement trend with the integration of existing commercial sustainable practices into forestry operations or the integration of existing commercial renewable materials into product portfolios.
Radical	Radical innovations are discontinuous events that change the key parameters of existing sustainable forestry practices or products. Innovations will have a significant impact on reducing deforestation and improving the sustainability of forestry and timber products. This includes products and production processes aligned with Circular Economy practice.
Transformative	Transformative innovations require a fundamental change in forestry operations, or the development of novel products and production processes aligned with the Circular Economy. Transformative innovations will promote sustainable forest landscape management or renewable products and materials at scale.

Source: CDP, Weterings (1997), de Beer (2000)

Four companies have developed radical or transformative innovations tackling illegal logging, often delivered through multi-sectoral partnerships with governments, NGOs, producers and forest communities. Some initiatives focus on engaging forest communities or small-scale producers to raise awareness around illegal logging, whilst other work to strengthen legislation or certification.

Weyerhaeuser ranks last with innovations including tools for tackling local sustainable forestry issues, protecting endangered wildlife and waterway management programme across the US. It is the only company not demonstrating any circular economy innovations.

Figure 36: Sustainable innovation score and degree of innovation



Source: CDP, company reports

Timber: the center of the circular economy?

The circular economy has emerged as an alternative to the current linear ‘take-use-dispose’ economic model, where waste is design out, materials and products maintain their value for as long as possible and any residual materials go on to regenerate natural systems.

Timber will be crucial to transitioning towards a circular, bio-based economy and the EU Forest Strategy stresses the importance of developing new wood-based materials and products. This presents a huge economic opportunity for timber companies willing to invest in innovation. Timber and by-products of pulp production can be used to make a range of renewable, non-toxic bio-based materials, from bioplastics and resins, to bitumen for constructing roads and synthetic graphite for lithium-ion batteries. Forest biomass is also predicted to play a role in the renewable energy transition.

Most pathways restricting global average temperature to 1.5°C by 2100 rely on large-scale afforestation and biomass used in power plants with carbon capture and storage. The forestry sector is therefore uniquely placed to both contribute to the circular economy and improve sustainable forest management.

However, there is a conflict between increasing the use of forests for renewable resources and the need to protect biodiversity and other ecosystem services provided by forest landscapes. Increasing logging levels to meet the demands of the circular economy could result in intensive large-scale monocultures of fast-growing trees and the destruction of natural forests. This would increase carbon emissions and reduce forests’ ability to sequester carbon and adapt to climate change.

Companies need to engage in careful landscape level forest management planning in order to minimise the environmental costs of increased harvest levels and rising demand for wood products. For example, increasing the diversity of tree species within forests and strategic biodiversity conservation management can improve carbon sequestration and climate change resilience in forest landscapes. Harvesting forests also generates carbon emissions and while some companies are adopting techniques to reduce the environmental impacts of logging, mainstream practices are yet to change.

Many timber companies are already demonstrating circular economy and sustainable forestry innovations. However, the right policy tools and certification frameworks are needed to ensure that the sector provides the biodiversity, carbon sequestration and other ecosystem services that will be key to tackling environmental degradation and climate change.

Figure 37: Sustainable innovation highlights

Company	Description	Score	Rank
UPM	<ul style="list-style-type: none"> Developing a digital map of harvesting conditions to improve harvesting methods and technology and decrease risks of soil damage and other operational challenges brought by climate change. Around 550 producers keep cattle on about 77,000 ha of UPM land, benefitting from the shelter of the trees and reducing combustible material, and the risk of forest fire for the company. 	80	1
Suzano	<ul style="list-style-type: none"> Sustainable Extractivism programme supports Brazilian community associations to produce and market non-timber forest products (e.g. babassu nut and açai) and preserve traditional practices. Brazilian Eucalyptus mosaic plantations are interspersed with native forests, protecting waterways and providing wildlife corridors. Use natural integrated pest management and fly ash as fertiliser. 	69	2
Stora Enso	<ul style="list-style-type: none"> Removing unexploded bombs from eucalyptus plantations in Laos, enabling local farmers to grow crops safely between the trees and reducing forest fires from traditional shifting cultivation. Lineo™ is a lignin-based renewable, non-toxic alternative to fossil-based materials, for example resins, bitumen for road construction and synthetic graphite for use in lithium-ion batteries. 	66	3
Empresas CMPC	<ul style="list-style-type: none"> Reforestation programme in Chile creates High Conservation Value Areas, restoring degraded forests with endangered indigenous species, creating wildlife corridors and buffer zones. Also Support forest communities to access potable water and harvest non-timber forest products. A range of projects to prevent and tackle forest fires in Chile through improved monitoring, forest management and local community engagement. 	61	4
Mondi Plc	<ul style="list-style-type: none"> Mondi Zimele, a South African subsidiary, supports communities and small businesses across the supply chain. Mondi purchases wood through the small-scale timber programme providing seedlings and training to 3,200 1-2 ha growers. Sustainable Working Forest model optimises timber yield while maintaining ecological networks to enhance biodiversity and ecosystem services, improving climate change adaptation. 	51	5
International Paper	<ul style="list-style-type: none"> Initiatives tackling illegal logging and promoting responsible forest management through WWF's Global Forest & Trade Network. Reduced-Impact Logging for Carbon initiative in Gabon and Indonesia with The Nature Conservancy, reducing emissions by up to 50% with better harvesting and regeneration practices. 	49	6
Asia Pulp & Paper	<ul style="list-style-type: none"> Rare tree conservation programme aims to repopulate 10 rare local trees across Indonesian plantations, in partnership with the government. LiDAR mapping to improve concession land zoning, improving water management, buffer zones and protected areas. Supports the Government of Indonesia's Peat Rezoning Plan. 	34	7
Weyerhaeuser	<ul style="list-style-type: none"> Developed the Forest in Focus tool with American Forest Foundation and Green Blue to provide stakeholders across the timber value chain with tools and incentives to tackle regional sustainable forestry issues in the US. The Mill Creek project explores the effect of wood in streams on salmon populations at a watershed scale. 	6	8

Source: CDP, company reports

Captial flexibility highlights

▼ Suzano and Weyerhaeuser have very high levels of debt and operate with leverage of more than 4x net debt /EBITDA, indicating reduced ability to take on additional debt required to invest in innovation.

▼ Weyerhaeuser and Suzano convert a very small amount of their net income into free cash flow, another indication of the lower flexibility to invest in the business.

Figure 38: Company leverage and cash conversion

Company	Net Debt/EBITDA FY 2019
UPM	-0.16
Mondi Plc	1.31
Stora Enso	2.03
International Paper	2.43
Empresas CMPC	3.66
Suzano	4.03
Weyerhaeuser	4.19

Source: CDP, company reports

Company	Free cash flow conversion
Weyerhaeuser	-7.66
Suzano	-0.97
Mondi Plc	0.61
Stora Enso	1.29
UPM	1.36
International Paper	1.91
Empresas CMPC	2.99

Source: CDP, company reports

Deforestation governance & strategy

- Timber policy commitments focus on avoiding illegally produced timber and protecting high conservation value areas.
- Mondi leads the group with a comprehensive sustainable forestry policy and robust procedures for managing forest-related risks.
- Governance of forest-related issues is relatively robust. All companies have a sustainability-related committee at board/executive level and three companies – Weyerhaeuser, Stora Enso, and International Paper – have committees at both levels.

Overview

Timber companies face a stringent regulatory environment governing the exclusion of illegally harvested timber and timber products in their supply chains, while also being exposed to growing reputational and market risks and physical impacts associated with climate change. Ensuring robust governance and implementing strong policies setting out companies' sustainable forestry commitments and expectations for suppliers is crucial for companies to demonstrate commitment to minimising exposure to deforestation and illegal timber. Recognising forests' vital role in mitigating climate change, providing ecosystem services and supporting biodiversity, as well as their importance to indigenous and local community livelihoods, policy commitments should go beyond eliminating deforestation and illegal logging to cover a broad range of environmental and social aspects critical to sustainable forest management.

Ensuring oversight of forest-related risks at board and executive levels and establishing robust risk management processes is imperative if companies are to demonstrate their readiness and commitment to achieving deforestation-free, sustainable supply chains. Many companies have set certification and conservation/restoration targets to quantify progress on sustainable production. However, stronger action is needed if companies are to signal to investors that they are committed to bringing about systemic changes in sustainable forestry practices.

In this chapter we assess companies on their deforestation governance and strategy using four key metrics:

Metric 1) Policy commitments & memberships (40%): Companies are assessed on the strength of commitments to address deforestation and promote sustainable production in their commodity-specific policies and public disclosures, as well as their support for key sustainability initiatives.

Metric 2) Board & executive level management (30%): Companies are assessed on a number of factors relating to board and executive deforestation responsibility performance, including the level of directors on the board with sustainability experience, the presence of sustainability-related committees at board and/or executive levels, and the overall quality of commodity-specific forest risk management systems.

Metric 3) Targets (20%): This metric aims to evaluate the strength of companies' deforestation-related targets.

Metric 4) CDP Forest ranking (10%): Companies are assessed according to their CDP Forests 2019 score. The CDP Score provides an aggregate measure of the quality of forest-related disclosure and management systems addressing forest-related risks.

Figure 39: Deforestation governance & strategy summary

Company	Policy commitments & memberships	Board & executive climate management	Targets	CDP Forest score (2019)	Overall weighted rank	Deforestation governance & strategy rank
Mondi Plc	1	4	5	A-	2.9	1
Stora Enso	2	3	2	A-	2.9	2
UPM	3	6	1	A	4.1	3
International Paper	8	1	4	A-	5.3	4
Weyerhaeuser	7	2	7	A-	5.8	5
Asia Pulp & Paper	5	8	6	B	6.2	6
Empresas CMPC	6	7	3	B	6.4	7
Suzano	4	5	8	B	6.6	8
Weighting	40%	30%	20%	10%		

Note: In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks in this summary for simplicity only.

Source: CDP

Policy commitments and membership highlights

- ▼ Sustainable timber production policy commitments typically focus on protecting high conservation value areas, avoiding biodiversity impacts, and respecting indigenous and local communities' rights. Specific commitments not to develop on peatland & prohibit clearance by burning or clearcutting are lacking.
- ▼ Five timber companies have comprehensive sustainable forestry policies in place for both own operations and suppliers. All eight timber companies have commitments not to source illegally produced timber.
- ▼ Six companies are members of FSC and the remaining two are members of PEFC (Figure 41). Four companies are members WBCSD Forests Solutions Group and five are members of the New Generation Plantations – global platforms dedicated to encouraging sustainable development in the forest sector.
- ▼ Mondi leads the group. The company has commitments to zero deforestation and no conversion of HCV areas in its own operations and supply chain, in addition to comprehensive provisions for protecting biodiversity and water resources and respecting indigenous, local communities', and workers' rights in line with international conventions.
- ▼ Although International Paper has high levels of certification of its owned/managed operations and a relatively comprehensive policy covering fibre procurement, specific policy commitments around sustainable production of its owned/managed operations are not as comprehensive as its peers, and the company ranks last in this metric.

Figure 40: Sub-set of environmental and social policy criteria evaluated

Timber specific policy commitments	Mondi Plc	Stora Enso	UPM	Suzano	Asia Pulp & Paper	Empresas CMPC	Weyerhaeuser	International Paper
Environmental								
Commodity-specific policy	Green	Green	Light Green	Green	Green	Yellow	Green	Light Green
Zero deforestation / zero net deforestation	Green	Light Green	Light Green	Green	Green	Green	Light Green	Light Green
No conversion of high conservation value areas	Green	Light Green	Light Green	Green	Green	Light Green	Light Green	Light Green
Biodiversity conservation	Green	Green	Green	Light Green	Light Green	Light Green	Green	Light Green
No sourcing of illegally produced timber	Green	Green	Green	Green	Green	Green	Green	Green
Water resource management	Light Green	Light Green	Light Green	Yellow	Yellow	Light Green	Light Green	Light Green
Protect waterways and water quality	Light Green	Light Green	Green	Light Green	Yellow	Yellow	Green	Light Green
Social								
Respect indigenous and local communities' rights	Green	Green	Green	Green	Green	Light Green	Light Green	Light Green
Secure Free, Prior and Informed Consent (FPIC)	Light Green	Green	Light Green	Yellow	Green	Light Green	Yellow	Light Green
UN Declaration on Human Rights / UN Guiding Principles on Business and Human Rights	Green	Light Green	Green	Light Green	Yellow	Yellow	Yellow	Yellow
UN International Labour Organization principles	Green	Green	Green	Light Green	Green	Light Green	Yellow	Yellow

Source: CDP, company reports

Clear commitment in commodity-specific policy; applies to own operations and procurement	Green
Evidence of commitment directly relating to commodity production; applies to own operations and procurement	Light Green
Commitment applies to either own operations or procurement only / included in wider company policies	Yellow
Not included within commodity-specific policy; no direct link to commodity	Red

Figure 41: Timber memberships⁽ⁱ⁾

Company	UNGC	WBCSD	New York Declaration on Forests	FSC member	PEFC member	WBCSD Forests Solutions Group	New Generation Plantations
Asia Pulp & Paper	✓	✓	✓	✗	✓	✗	✗
Empresas CMPC	✓	✓	✗	✓	✗	✓	✓
International Paper	✗	✓	✗	✓	✓	✓	✗
Mondi Plc	✓	✓	✗	✓	✓	✓	✓
Stora Enso	✓	✓	✗	✓	✓	✓	✓
Suzano	✓	✓	✗	✓	✓	✗	✓
UPM	✓	✓	✗	✓	✗	✗	✓
Weyerhaeuser	✗	✓	✗	✗	✓	✗	✗

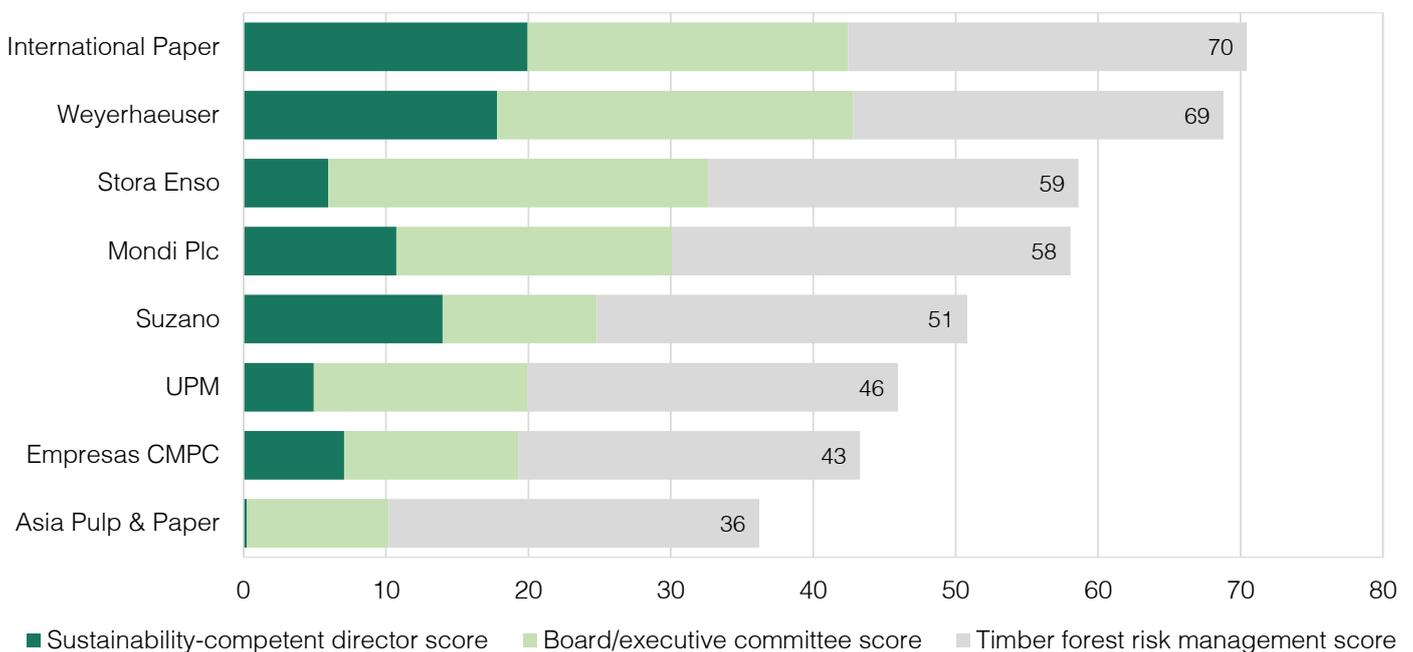
(i) Companies are displayed in alphabetical order. Company scores for memberships are included in overall scores for the Policy commitments & memberships metric.
Source: CDP, company reports

Board & executive level management highlights

International Paper rank top, performing well across all three sub-metrics (Figure 42). The company has sustainability-related committees at both board and executive level, while 10 of the company’s 11 directors have some level of sustainability experience. One director is a former administrator of a US government scientific agency and was involved in the development of an earth observation system to support sustainable agriculture, and is deemed to have very high levels of expertise. The company also ranks joint first with Mondi in terms of forest-risk management processes.

- Although Asia Pulp & Paper has relatively robust forest-risk management procedures, it performs poorly in terms of director experience with just one of its directors assessed as having a very low level of sustainability expertise, ranking last overall in this metric.
- Overall, 57% of directors are assessed to have some level of sustainability expertise, of which 12% were deemed to have high (7%) or very high (5%) levels of experience.

Figure 42: Board & executive level management

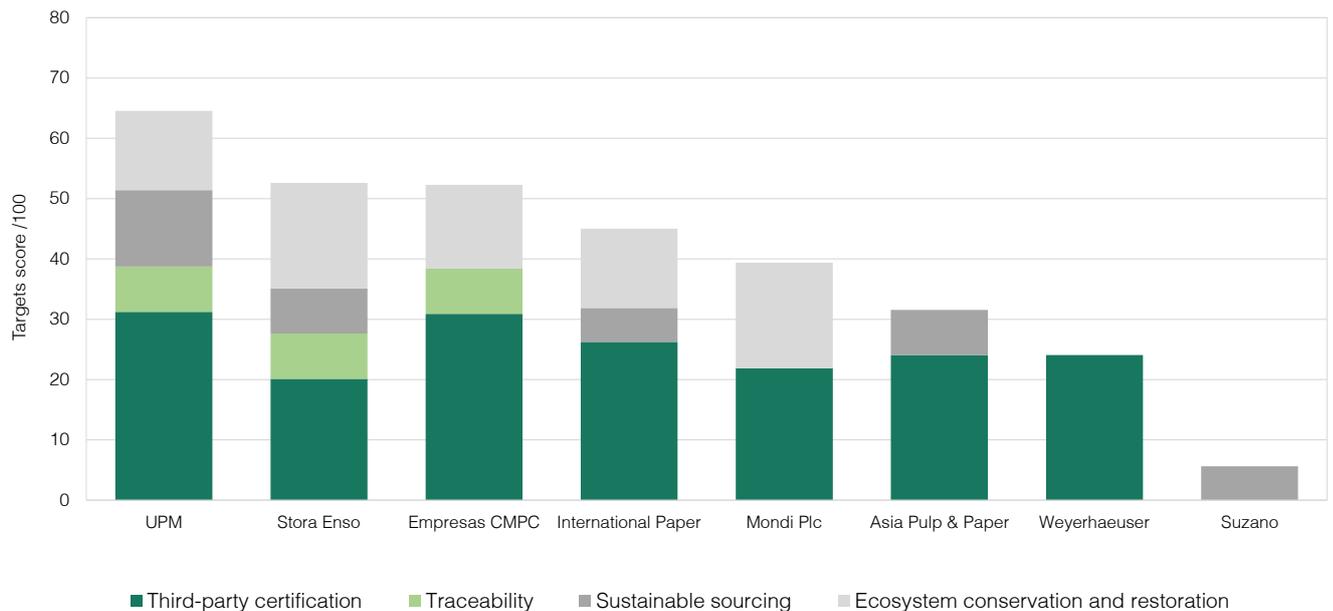


Source: CDP, company reports

Targets highlights

- Timber companies' deforestation-related targets cover four key areas: third-party certification; traceability; sustainable sourcing; and ecosystem conservation and restoration. Seven of eight companies have targets aimed at increasing third-party certification of their timber supply.
- UPM ranks first and was one of two companies with targets covering all four key areas. The company has also set an ambitious target to have 100% of its wood from third-party certified sources by 2030.
- Stora Enso ranks second for this metric, also with targets covering all four key areas. However, all of the company's target dates have expired, highlighting the need to set more ambitious time-bound goals.
- Three companies' have expired target dates across all four key areas. The lack of forward-looking targets indicates that companies need to do more to set ambitious targets to improve the sustainability of timber production within their supply chains.
- Only three companies, UPM, Stora Enso and Empresas CMPC, have specific targets on traceability. Whilst this issue is often covered by third-party certification commitments, traceability is still an important element of ensuring the legality and sustainability of uncertified timber.
- Suzano ranks last with no evidence of targets around traceability or third-party certification of their timber supply.

Figure 43: Timber deforestation-related target score



Source: CDP, company reports

Soy & Cattle

Transition risk

- ▼ The tree loss to production ratio is 10x greater for cattle companies than for soy companies.
- ▼ Cargill and Louis Dreyfus rank first and second respectively, with both companies performing consistently well within the land use and certification and traceability metrics.
- ▼ JBS and Minerva Foods rank in the bottom two overall.

Overview

By the start of 2020, around 50 million hectares of forest were estimated to have been destroyed for global commodity production,⁽¹⁸⁾ with beef and soy driving more than two-thirds of the recorded habitat loss in the Brazilian Amazon and Cerrado biomes (see thought box on page 41) and the Gran Chaco region across Argentina and Paraguay.⁽¹⁹⁾

Demand for soy and beef is rising, driven predominately by China and as a result of a growing appetite for meat-based diets across the globe. Rising demand for beef also increases the need for soy production, with around 70% of soybean meal used as animal feed.

Expansion of soy and cattle production are intrinsically linked. Forests are often cleared for cattle ranching and the resulting pastures are then converted into soy farms. This drives up the price of surrounding land, incentivising further forest clearance, which in turn displaces cattle ranching into other forested areas where the cycle continues.

Brazil, Argentina and Paraguay account for around 50% of global soy production, while Brazil has the second-largest cattle herd in the world. Soy trade is dominated by a few major companies. In 2016 the largest six exporters traded almost 60% of soy in Brazil. These companies wield great control over production within the region with a highly integrated networks of silos, crushing facilities, slaughterhouses and trading routes enabling them to respond rapidly to trading signals.⁽²⁰⁾ While these companies could use their market dominance to promote superior standards at scale, soy and cattle sectors have been hit by large-scale scandals highlighting malpractice, exertion of political influence and poor environmental practices among their suppliers.

A recent study has shown just 2% of properties in the

Amazon and Cerrado are responsible for 62% of all potentially illegal deforestation.⁽²¹⁾ With such vast supply chains, and thousands of suppliers providing soy and cattle from all over the continent, companies are at risk of sourcing from areas where deforestation has occurred or are wilfully turning a blind eye to the problem.

Cattle supply chains remain largely untraced among the biggest producers. So-called indirect suppliers are unmonitored ranches where cattle are raised and reared, potentially on illegal deforested land. It is only once the cattle is passed onto fattening farms and through to slaughterhouses that major companies begin tracing.

Transition risks are assessed across the following metrics:

Metric 1) Land use (60%): Using production data sourced from Trase and tree loss data from Global Forest Watch (GFW), we compare tree loss at a municipality level in Brazil, Paraguay and Argentina against the relative company production of soy and cattle from within the same regions. We then form a risk related score to highlight companies that have been producing soy and cattle from areas with high year on year tree loss over a 10 year period in Brazil.

Note: This analysis aims to identify where high levels of tree loss have occurred relative to soy and cattle production. A strong correlation between the two variables does not mean they are intrinsically connected, but merely that both are occurring.

Metric 2) Traceability, Certification and Procurement (40%): Here we assess companies on the percentage of their traceable direct supply, levels of deforestation related certification and whether companies are reporting on the percentage and extent of production sourced from indirect suppliers.

Figure 44: Transition risks summary

Company	Land use	Certification, traceability and procurement	Overall weighted rank	Transition risks rank
Cargill	3	2	3.0	1
Louis Dreyfus	2	4	3.5	2
AMAGGI	7	1	3.5	3
ADM	4	3	3.8	4
COFCO	1	8	4.0	5
Bunge	5	5	4.7	6
Glencore Agri	6	7	5.6	7
Marfrig	8	6	6.8	8
JBS	9	10	8.3	9
Minerva Foods	10	9	9.1	10
Weighting	60%	40%		

Note: In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks for simplicity only. Source: CDP

18. Greenpeace International, 2019, Countdown to extinction

19. WWF, 2018, Drivers of tropical deforestation

20. Trase Yearbook 2018

21. Raoni et al., 2020, The rotten apples of Brazil's agribusiness

Land use highlights

This metric seeks to provide a bottom up analysis of the relationship between soy & cattle production and tree loss in high deforestation risk regions. Production data is collected from Trase at a municipality level within Brazil, Argentina and Paraguay for soy and Brazil for cattle. We compare this against tree loss data collected from GFW. Tree loss is defined as a loss in tree cover canopy density at a minimum threshold of 50%. Tree loss is not the same as deforestation as it includes changes in both natural and planted forest, and does not have to be caused by human activity.

This metric is divided into two parts:

Tree loss / Production: Here we compare average production of soy and cattle against tree loss, taking an average of production and tree loss data from 2015-2017 for Brazil and 2016-2018 for Argentina and Paraguay (2018 data was not available for Brazil at the time of analysis). Scores are aggregated relative to company percentage production in each region. To make a direct comparison between soy and cattle, production values are converted from tonnes into US dollars using an average price index for soy and cattle.

Tree loss trend: The trend in year on year tree loss is calculated within each municipality in Brazil from 2008-2017. Municipalities are then assigned a risk category based on the level of tree loss. A weighted score (out of five) is aggregated for each company based on the rate of tree loss within each municipality relating to production. Companies that have been operating in areas with high rates of tree loss over time are deemed to be more at risk of being exposed to deforestation in their supply chains.

Across the regions of Brazil in which the companies within this report are operating, on average, close to 4 million hectares (ha) of tree loss has occurred from 2015-2017, while the 10 cattle & soy companies produced over 60 Mt of soy and 1.4 Mt of beef in these areas in the same period.

Figure 45 shows that the companies within our sample source the majority of South American soy supply from Brazil. Due to data availability, the cattle companies within our sample were assessed based on cattle production in Brazil only.

Figure 45: Proportion of production derived from Trase for Brazil, Argentina & Paraguay (three year average)⁽ⁱ⁾

Company	Commodity	Brazil	Argentina	Paraguay
ADM	Soy	84%	6%	11%
AMAGGI	Soy	91%	6%	3%
Bunge	Soy	78%	20%	3%
Cargill	Soy	69%	21%	10%
COFCO	Soy	57%	24%	18%
Glencore Agri ⁽ⁱⁱ⁾	Soy	24%	43%	33% ⁽ⁱⁱⁱ⁾
Louis Dreyfus	Soy	51%	46%	3%
JBS ^(iv)	Cattle	100%	0%	0%
Marfrig	Cattle	100%	0%	0%
Minerva	Cattle	100%	0%	0%

(i) Three year average taken from 2016-2018 for Argentina and Paraguay and 2015-2017 for Brazil. 2018 data for Brazil was not available at the time of analysis and is therefore not included in this assessment. Cattle companies are assessed on Brazil production only. The figures in this table are representative of production values derived from Trase and may differ from company figures. We recognise that companies may also source soy from other regions, including from outside of South America.

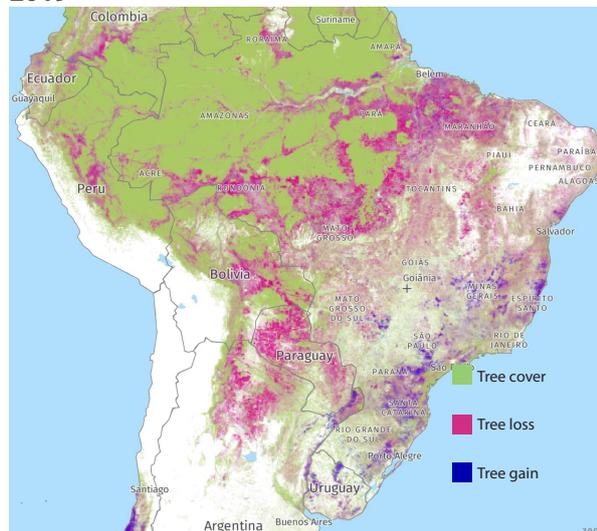
(ii) Due to a lack of Trase data for Argentina & Paraguay, we display and use the production split disclosed by Glencore Agri to CDP. Glencore's score is calculated based on its Brazil production only, as information for the other regions was not available from Trase for the period analysed.

(iii) 33% refers to Glencore's remaining production, including North America, Europe and other countries in Latin America.

(iv) JBS is assessed based on its cattle production only.

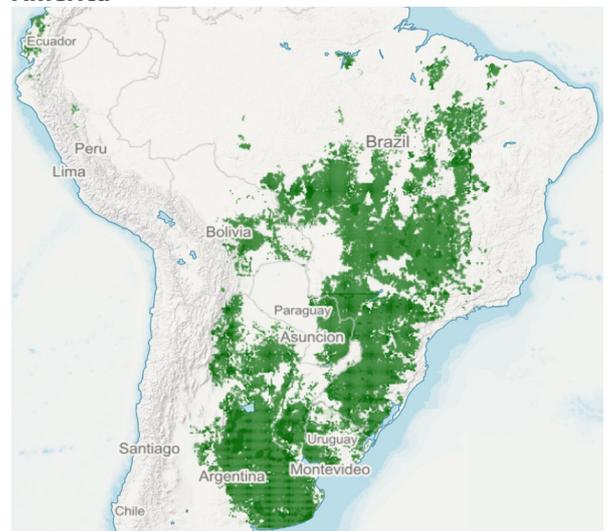
Source: CDP, Trase

Figure 46: Tree loss across South America 2001-2019



Source: Global Forest Watch

Figure 47: Soybean production across South America



Source: WRI Food

Figure 48: Brazil - Tree loss / Production & Tree loss / value⁽ⁱ⁾

Company	Commodity	Production (kt eq.)	Tree loss / Production (ha / 000 tonnes)	Tree Loss / Commodity value (ha / \$M)
Louis Dreyfus	Soy	7,025	33.6	76
COFCO	Soy	5,750	33.7	77
ADM	Soy	10,854	42.7	97
Bunge	Soy	14,398	42.8	97
Cargill	Soy	13,394	64.0	146
Glencore Agri	Soy	2,405	79.2	180
AMAGGI	Soy	6,473	87.1	198
JBS	Cattle	722	3,004	986
Marfrig	Cattle	276	5,181	1,701
Minerva	Cattle	345	5,808	1,907

(i) We converted soy and cattle production into a monetary value by using the average soy and cattle prices to allow for direct comparison
Source: CDP, Trase, Global Forest Watch

Figure 49: Argentina Soy - Tree loss / Production⁽ⁱ⁾

Company	Production (kt eq.)	Tree loss / Prod. (ha / 000 tonnes)
Cargill	4,101	15
Bunge	3,649	16
Louis Dreyfus	6,257	19
COFCO	2,436	25
ADM	733	73
AMAGGI	411	141

(i) Glencore source 43% of its production from Argentina, 90% of which has been sourced from states outside the Argentine Gran Chaco.
Source: CDP, Trase, Global Forest Watch

Figure 50: Paraguay Soy - Tree loss / Production⁽ⁱ⁾

Company	Production (kt eq.)	Tree loss / Prod. (ha / 000 tonnes)
Cargill	1,877	5
AMAGGI	235	6
COFCO	1,834	11
ADM	1,373	32
Bunge	512	34
Louis Dreyfus	418	50

(i) No data available for Glencore Agri.
Source: CDP, Trase, Global Forest Watch

On average the tree loss to production ratio is 10 times greater for cattle companies than it is for soy companies when compared on a commodity value basis. As a result, the three cattle companies rank last overall in the land use metric. In the municipalities where Minerva sources cattle, close to 6000 ha of tree loss has occurred for every thousand tonnes of beef produced by the company.

Para and Rondonia states within the Amazon and Mato Grosso state which falls between the Amazon and Cerrado biome have seen the greatest tree loss (Figure 52). Soy production is particularly concentrated within these states where the Cerrado and Amazon biomes meet and where initiatives such as the Soy Moratorium are harder to enforce.

Figure 51: Tree loss across South America 2009-2018

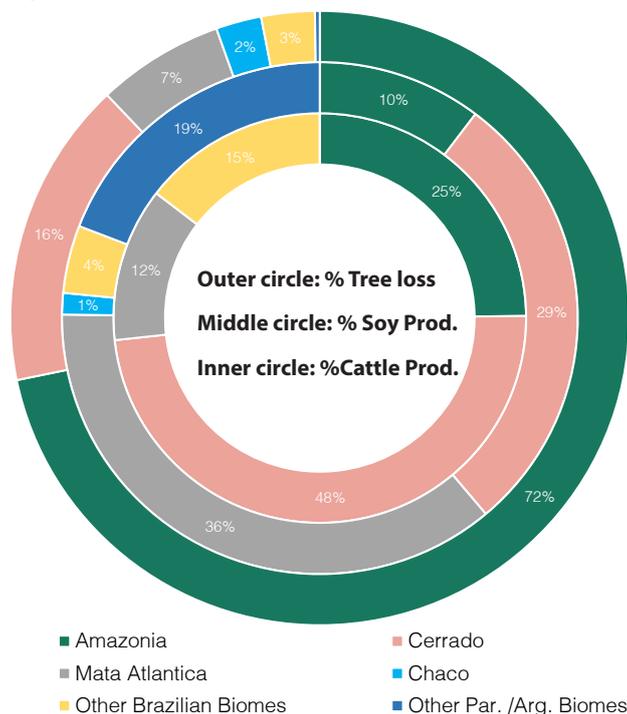


Figure 52: Soybean production across South America

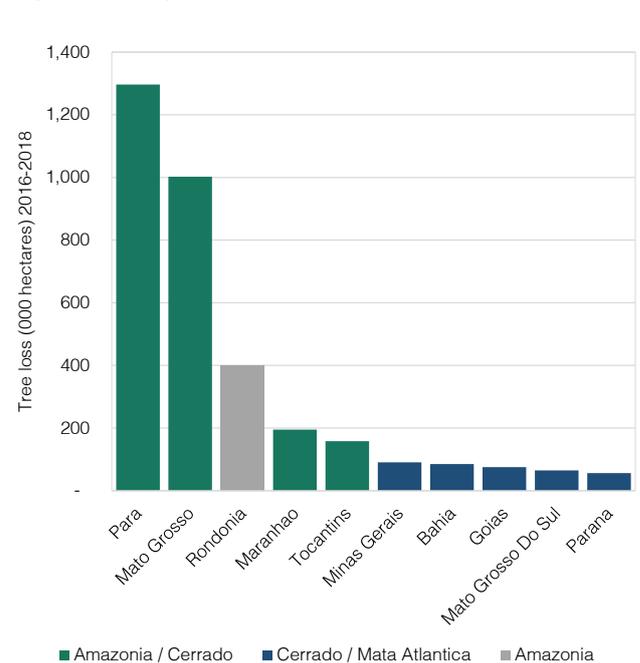
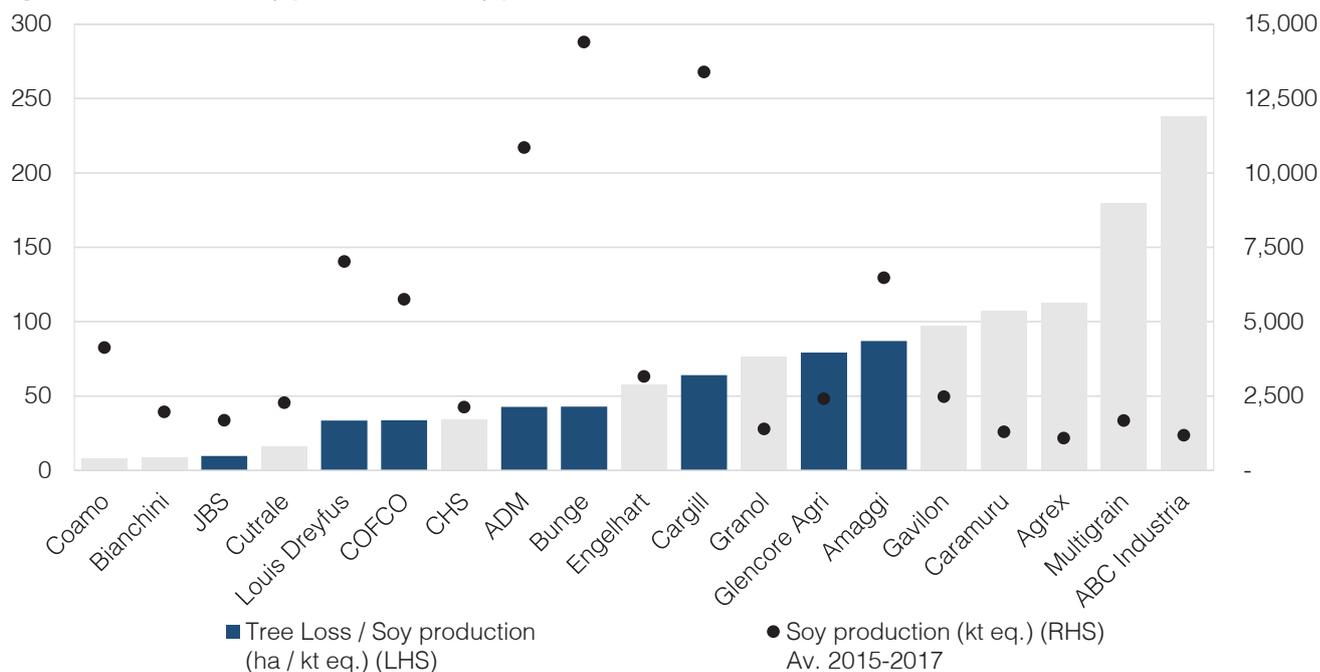


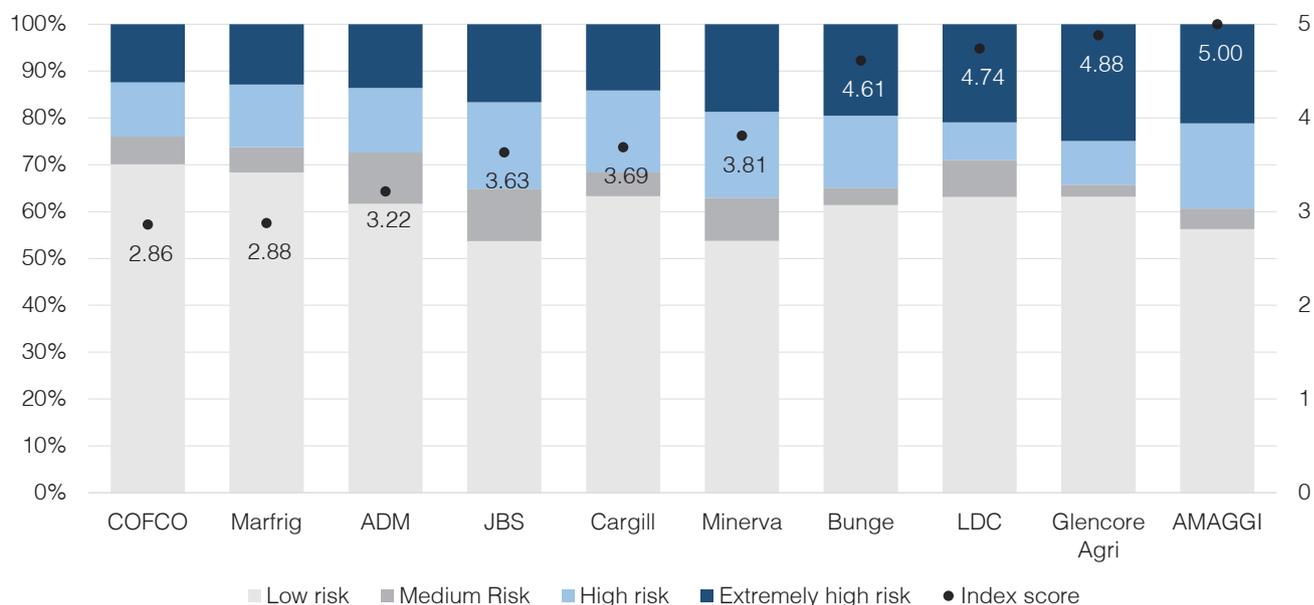
Figure 53: Tree loss / soy production & soy production volumes in Brazil⁽ⁱ⁾



(i) Soy production volumes are derived from Trase data and may not be representative of actual company volumes.
Source: CDP, Trase, Global Forest Watch

- Among the soy companies, Glencore Agriculture and AMAGGI have the highest tree loss / production intensities in Brazil (Figure 48). Both companies have a significant proportion of their soy production coming from the Mato Grosso region where tree loss is particularly high, while AMAGGI also has a high tree loss/ production intensity in Argentina.
- COFCO and Louis Dreyfus rank first and second overall within the land use metric. Both companies have a low tree loss / production intensity within Brazil. Louis Dreyfus derives a significant proportion of its soy production from Argentina where tree loss is lower. COFCO has the lowest tree loss trend score (Figure 54) and a low tree loss / production intensity in Paraguay.
- Figure 53 shows the extent to which private companies outside of our sample are contributing significantly to problems of deforestation in Brazil. Without investor pressure to encourage measures to curb deforestation at the industry-level, rising demand and an increasingly competitive market will see forest loss continue in ecologically important regions.
- 18% of total company production stems from areas deemed to be of extremely high risk and where historical rates of deforestation have been high in Brazil (see Figure 54).
- AMAGGI ranks last within the tree loss trend submetric. Close to 40% of soy production was sourced from areas in Brazil deemed to be high or extremely high risk over a 10 year period.

Figure 54: Tree loss trend - Brazil



Source: CDP, Trase, Global Forest Watch

Traceability, certification and procurement highlights

With only one company (AMAGGI) within our sample owning land, the majority of soy and cattle production is sourced from an extensive network of farmers and ranchers. Tracking these supply chains is fundamental to ensuring cattle and soy companies are not directly responsible for deforestation. Third-party certification can also drive standards in sustainable production of commodities. With a large percentage of procurement derived from indirect suppliers it is imperative that companies clearly disclose the proportion of their supply that is derived from these sources.

Figure 55: Traceability, certification and procurement summary

Company	Disclosure data	Traceability		Certification		Procurement	
		Traceable to	% of traceable direct supply	Certification standard	% vol. certified	Disclosing indirect suppliers	Proportion of supply from indirect suppliers
AMAGGI	2019	Farm	99.5% South America	RTRS, ProTerra AMAGGI responsible standard	23%	Yes	11.3% South America
Cargill	Jun-20	Farm	100% Brazil 80% Argentina 36% Bolivia 72% Paraguay	ISCC, RTRS, 2BSVs Triple S	Unknown	Yes	Brazil 31% Argentina 48% Bolivia 16% Paraguay 52%
ADM	2019	Farm	70% Paraguay 95% Mato Grosso 100% MATOPIBA 95% Mato Grosso do Sul	ISCC, RTRS, ProTerra, 2BSVs, ADM Responsible Soy	3-5% est.	Partial	25 priority municipalities in Cerrado 6% ^(iv)
Louis Dreyfus	Jun-20	Municipality Farm Farm	Brazil 67% Brazil 33% Argentina 51%	ISCC, RTRS 2BSVs	51% Argentina 7% Paraguay	Partial	Brazil 46-47%
Bunge	Apr-20	Farm	95% High risk areas ⁽ⁱ⁾ 91% Cerrado 100% Chaco, Paraguay	ISCC, RTRS, ProTerra, 2BSVs, PRO -S	3-5%	Partial ⁽ⁱⁱⁱ⁾	25 priority municipalities in Cerrado 2% ^(iv)
Marfrig	2020	Fattening Farm Fattening Farm Rearing Farm	100% Amazon Biome 80% Brazil 25% Brazil	Rainforest Alliance Certified™ seal	0.5%	Yes	Brazil 50-55%
Glencore Agri	2020	Farm	62% Brazil Argentina ^(v)	ISCC, RTRS (member only) 2BSVs	Unknown	Partial	25 priority municipalities in Cerrado 35% ^(iv)
COFCO	2020	Farm	100% 25 priority municipalities in Cerrado ^(iv)	ISCC, RTRS, 2BSVs, RenovaBio	Unknown	Partial	25 priority municipalities in Cerrado 4.1% ^(iv)
Minerva Foods	2020	Fattening Farm Fattening Farm	100% Brazil 50% Paraguay	None	Unknown	No	Unknown
JBS ⁽ⁱ⁾	2020	Fattening Farm	100% Brazil	None	Unknown	No	Unknown

(i) JBS are assessed on its cattle production only.

(ii) As defined by the company.

(iii) Bunge state that it is engaging with 40% of its indirect suppliers.

(iv) 25 priority municipalities in the Cerrado, as defined by the Soft Commodities Forum.

(v) Over 90% of Glencore's soy is sourced from areas at very low risk of deforestation, from states outside the Argentine Gran Chaco.

Source: CDP, company reports

Soy companies are only tracing production from direct suppliers within their supply chains. Although traceability to a direct supplier level is high with some companies able to trace close to 100% to farm level, traceability of indirect suppliers is extremely limited.

Only three companies give a detailed indication of the proportion of supply coming from indirect sources and no company is disclosing on the level of traceability among its indirect suppliers. The majority of companies are only disclosing the proportion of production derived from indirect sources within high risk areas which in some cases is only a fraction of overall production volumes.

AMAGGI and Cargill rank in the top two. Both companies give a detailed breakdown of the proportion of production derived from indirect suppliers. AMAGGI and Cargill also have good levels of traceability to their direct suppliers, with AMAGGI able to trace 99.5% of its direct suppliers, equivalent to 88% of total supply.

Supply chain traceability among cattle producers is extremely poor. There is almost no visibility as to where cattle are bred or reared, with only one cattle company - Marfrig - tracing supply beyond a fattening farm level. This leads to the risk of "cattle laundering" where cattle owners move cattle that were reared on illegally cleared land to established fattening farm pastures before being slaughtered.

- ▼ Currently no third-party deforestation related certification standards exist for cattle producers. However, Marfrig have a very small proportion of its supply certified by the Rainforest Alliance. Without certification standards it is difficult for companies to provide assurance to customers that their supply has been produced sustainably and in line with zero deforestation commitments.
- ▼ While all soy companies assessed have some level of certified production, only four companies report the total percentage certified. There are currently a number of certification schemes available to companies and the top three companies have their own certification standards, however, a number of companies state that demand for certified soy is currently limited.
- ▼ Companies need to disclose the total level of traceability across their supply chains, even within areas where levels of deforestation risk may be relatively low. With soy and cattle demand increasing and production patterns shifting, so too do the areas at risk of deforestation, as evidenced by the rise in deforestation in the Cerrado following introduction of the Amazon Soy Moratorium.
- ▼ While the Soy Moratorium has achieved a substantial decline in deforestation in the Amazon, such measures cannot be relied upon alone: it is imperative companies undertake their own monitoring and disclosure to ensure no deforestation commitments are being met across their supply chains.

Cerrado Manifesto lacks support from key players

Introduction of the Amazon Soy Moratorium (ASM) in 2006 banning the purchase of soy grown on land deforested in the Brazilian Amazon after 2008 saw a dramatic decline in deforestation rates associated with soy production. An estimated 1% of soy expansion occurred through deforestation in the Amazon in 2014, compared with nearly 30% in the two years preceding the Moratorium.⁽²²⁾

However, stricter rules governing the Amazon caused agricultural expansion to move elsewhere – into the Cerrado. A landscape characterised by savannah, woodlands, and forest, the Cerrado covers a large part of central Brazil and parts of northeastern Paraguay and eastern Bolivia. Deforestation rates in the Cerrado have overtaken the Amazon over the past decade, largely driven by agricultural expansion for soy and cattle production. At the frontier of expansion is the Matopiba region, comprising parts of the Brazilian states of Maranhão, Tocantins, Piauí, and Bahia. The soy production area expanded by 9.5 million hectares in the Cerrado between 2000-2017, almost a third of which was as a result of native vegetation clearance, largely in Matopiba.⁽²³⁾

Recognising the need to protect the Cerrado, in 2017 over 60 NGOs, foundations and scientific institutes introduced the Cerrado Manifesto. The Manifesto calls for action by companies that purchase soy and meat from within the biome, and investors active in these sectors, to help eliminate deforestation and conversion of native vegetation.

Despite their willingness to support the ASM, none of the major soy processors and traders have signed. The situation is different this time. The Cerrado accounts for over half of soy grown in Brazil, and higher levels of competition mean any action requires collaboration among key players. Moreover, Amazon deforestation has largely been illegal due to requirements under the Forest Code for farmers to preserve up to 80% of native vegetation on their land. With this requirement at just 20-35% in the Cerrado, much land clearance in the biome has been legal, and a proportion of remaining native vegetation could also be cleared legally. That said, 23 million hectares of already converted land in the region is estimated to be suitable for agricultural production, suggesting there is scope for expansion to continue without further conversion of native vegetation.⁽²⁴⁾

Cargill reasons that more needs to be done to protect farmers' legal land rights and that an approach needs to be taken that goes further in addressing social and economic challenges, or there is a risk the problem could be transferred to other companies or activities. The company has created a USD\$30 million fund to contribute to ending deforestation in the region and support finding an economically viable alternative for producers to native vegetation conversion. Measures in the Cerrado should also take into consideration some of the shortcomings of the ASM. For example, soy traders can continue to purchase soy from farmers who engage in deforestation for other activities, provided there is no deforestation on the part of the property where soy is grown.⁽²²⁾

Environmentalists are concerned that without the support of major agribusiness companies the Manifesto lacks the force to eliminate deforestation in the Cerrado. Commodity traders have shown support for additional measures to address deforestation in the region and are engaging with the Manifesto, including through their participation in the Cerrado Working Group. But with deforestation continuing, further action is needed. What's evident from the views of both sides – and lessons learned from the ASM – is that there can be no long-term solution without greater industry-wide collaboration and increased engagement among processors and traders, NGOs, global businesses, working groups, and producers.

22. H. K. Gibbs et al., 2015, Brazil's Soy Moratorium

23. A. Vasconcelos, D. Meyer, & H. Burley, 2018, Are Brazilians eating the Cerrado?

24. L. Rausch et al., 2019, Soy expansion in Brazil's Cerrado

Transition opportunities

- ▶ The majority of soy and cattle companies' innovations fail to tackle deforestation at scale and are limited to small-scale incremental initiatives providing education and financing to promote sustainable agriculture and reduce deforestation.
- ▶ AMAGGI, Louis Dreyfus and Bunge rank in the top three. AMAGGI has the strongest overall innovations, but Louis Dreyfus and Bunge are the only companies with innovations deemed to be transformative.
- ▶ COFCO and Glencore rank in the bottom two. Neither company show evidence of innovations beyond an evolutionary scale.

Overview

The environmental impact of soy and cattle production in South America is coming under increasing scrutiny from stakeholders around the world, particularly those farms in Brazil's important Amazon and Cerrado biomes. Companies need to develop systematic solutions to decouple soy and cattle production from deforestation if they are to sustainably meet rising demand.

Soy cultivation is typified by intensive large-scale monoculture farms, with high fertiliser and herbicide use to maximise yield. Cattle farming in South America is often extensive rather than intensive, with cattle free to roam over vast areas of land. It is easier and cheaper to increase production by clearing forested areas or converting savannah into pastures than to increase yields on existing agricultural land. Agricultural expansion is therefore at odds with any efforts to conserve or restore biodiverse natural habitats.

Sustainable innovation in soy and cattle production is limited, but companies are beginning to take the first steps towards improving sustainability through improving the traceability and transparency of their supply chains. Other basic innovations involve engaging suppliers with educational programmes tackling deforestation and improving farming practices.

Evolutionary and radical innovations range from measuring and monitoring land use change and tree health to climate change adaptation and advanced supplier compliance and engagement. Transformative innovations within the sector are limited, but include long-term financing allowing farmers to invest in more sustainable production and expansion that does not cause further deforestation or conversion of native vegetation.

Proactive companies are therefore those that are looking beyond the business-as-usual approach to farming soy and cattle, with a longer-term view on incentivising

farmers to invest in more sustainable agricultural techniques that will reduce the risk of deforestation in the future.

In this section, we explore sustainable innovation to demonstrate where companies are investing in radical and transformative solutions associated with step changes in sustainable soy and cattle production. A bespoke innovation matrix was developed from de Beer (2000) and Weterings (1997). Innovations are scored on an exponential scale and defined as incremental, evolutionary, radical and transformative, depending on their potential to improve the sustainability of production. Innovations are also assessed on their geographical spread and relative deforestation-risk, ranging from a single location in a low deforestation-risk area, to high deforestation risk countries and regions and global coverage.

Transition opportunities are assessed across the following metrics:

Metric 1) Sustainable innovation (75%): We compile a list of sustainable innovations for each company and assign each innovation two scores. The first assesses whether the innovation is incremental, evolutionary, radical or transformative. The second assigns the scale of each innovation from a single location to global distribution. We take the top 10 innovations for each company and combine the two scores to give a final innovation score out of 100.

Metric 2) Capital resilience (25%): Companies with more resilient business models are more flexible to adapt to economic uncertainty, increased regulatory scrutiny and market uncertainty. These companies have the greater ability to drive market innovation and transformation in the face of changing customer trends and production models.

Figure 56: Transformative change theory

Innovation	Definition
Incremental	Improvements to existing cattle and soy production, providing marginal, small-scale improvements to sustainability.
Evolutionary	Evolutionary innovations are a continuation of the existing improvement trend with the integration of existing commercial sustainable practices into cattle and soy production processes.
Radical	Radical innovations are discontinuous events that change the key parameters of existing sustainable cattle and soy production and will have a significant impact on reducing deforestation. This includes more comprehensive supplier engagement and real-time supply chain monitoring.
Transformative	Transformative innovations require a fundamental change in cattle and soy production, taking a systematic approach to tackling deforestation and improving the sustainability of production across supply chains at scale.

Source: CDP, Weterings (1997), de Beer (2000)

Figure 57: Transition opportunities summary⁽ⁱ⁾

Company	Sustainable innovation	Capital flexibility	Overall weighted rank	Transition risks rank
AMAGGI	1	NA	1.0	1
Louis Dreyfus	2	NA	2.0	2
Bunge	3	3	4.7	3
Marfrig	5	2	5.9	4
Cargill	4	NA	6.2	5
ADM	6	5	6.5	6
JBS	8	1	7.6	7
Minerva Foods	9	3	8.1	8
COFCO	7	NA	8.2	9
Glencore Agri	10	NA	8.5	10
Weighting	75%	25%		

Note: In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks in this summary for simplicity only.

(i) The private companies - AMAGGI, Cargill, COFCO, Glencore Agri & Louis Dreyfus are assessed on sustainable innovation only.

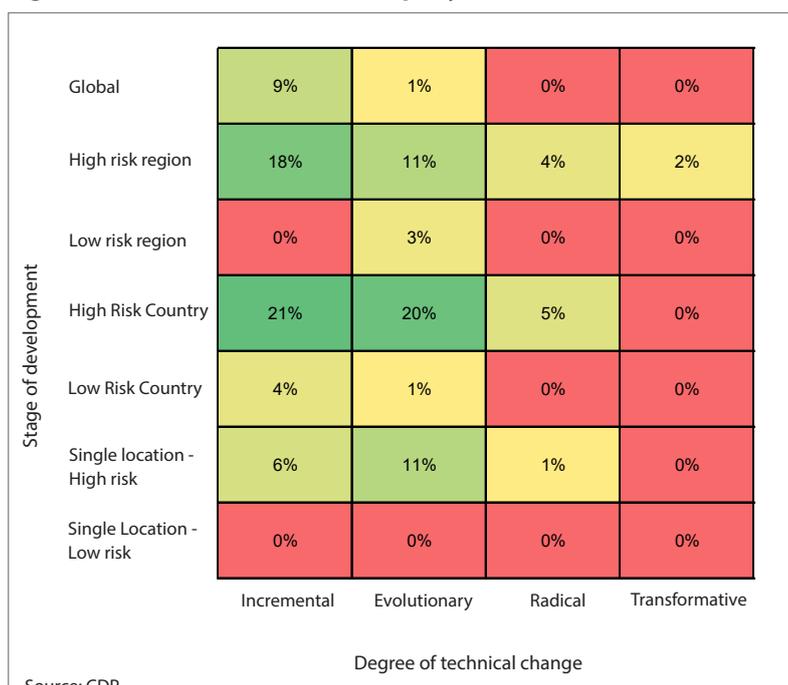
Source: CDP

Sustainable innovation highlights

Levels of innovation among soy and cattle producers are less advanced when compared to palm oil and timber companies. While most companies are investing in geospatial satellite technologies to improve traceability of suppliers and engaging with farmers and smallholders to work towards more sustainable farming practices, innovations that look to decouple production from large-scale monocultures or actively regenerate forested areas are limited. The most progressive companies are those looking to provide financial incentives to actively encourage production without further deforestation or conversion of native vegetation.

- Figure 58 shows that the majority of soy and cattle innovations are categorised as incremental. Only 10% of all of the companies' top 10 innovations were considered radical and 2% were deemed as transformative. Only two companies, Louis Dreyfus and Bunge have innovations that were considered transformative.
- Innovations within this sector include the roll out of sustainable agricultural techniques such as improving soil health, adoption of no tillage, better use of inputs, water conservation and precision agriculture. Most companies are also involved in workshops or events to educate producers and smallholders in sustainable agronomic practices.
- Louis Dreyfus and Bunge rank second and third, respectively. Both companies have innovations relating to sustainable financing initiatives that are considered transformative. Bunge's program is designed to promote agricultural production without further deforestation or conversion of native vegetation. While most loans currently available to soy farmers are for less than a year, this mechanism will offer loans of up to 10 years, recognizing that investments in land acquisition and preparation have a long-term payback. Louis Dreyfus launched a preferential long-term financing line in 2019 to incentivize producers to expand on already cleared areas, instead of converting native vegetation. Certain conditions have to be met to acquire the loan such as ensuring all farms are covered and complying with legal, social and environmental criteria, including the Brazil Forest Code (for more information see the box on page 44).
- AMAGGI ranks first for sustainable innovation. Although no innovations were considered transformative the company has a suite of radical and evolutionary innovations being applied across South America. Innovations include the development of high germination seeds, its ORIGINAR geospatial analysis platform, the AMAGGI Technological Circuit which aims to improve agricultural practices of producers within the high risk states of Mato Grosso and Rondônia and nurseries producing native seedlings on farms located in the Amazon biome.

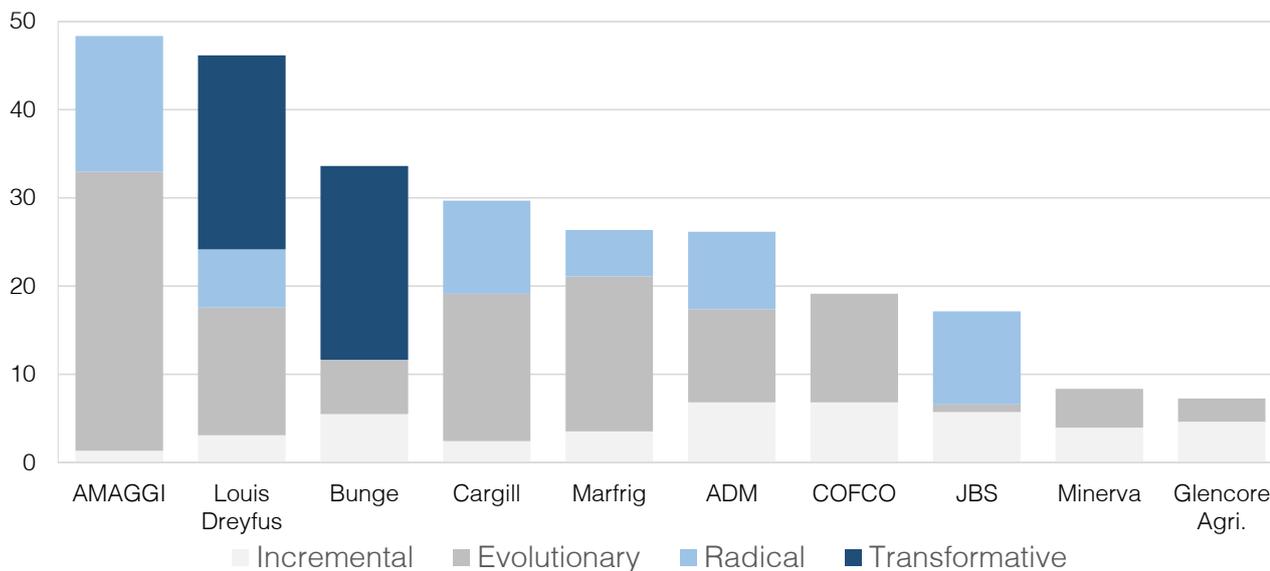
Figure 58: Innovation matrix company distribution



▼ Marfrig are the highest ranked cattle company. In 2019, it began to monitor fire hotspots in the Amazon Biome to enable it to inform its suppliers about possible fires on their farms and alert them to preventive actions on the properties. It also launched the first Rainforest Alliance certified hamburger made from meat produced according to the highest production, environmental, social and animal welfare management standards.

▼ Glencore Agriculture and Minerva rank in the bottom two. Neither company show evidence of innovating beyond an evolutionary scale. While Glencore is conducting projects to restore deforested areas near its operations, there is little evidence to suggest this innovation is being applied in its soy operations.

Figure 59: Sustainable innovation score and degree of innovation



Source: CDP, company reports

Financing sustainable soy

Major soy companies provide farm inputs and other services to the growers they buy from, such as seeds, fertilizer and credit. These companies therefore play a central role in the decisions that farmers make about what, where and how to farm, and vitally whether farmers choose to clear native forests for farming.

Usually soy growers only have access to loans for less than a year to finance farming costs, which means they struggle to finance the long-term investments needed to transition to more sustainable, deforestation-free production. Long-term, sustainability-focused financing from large agribusinesses could help to drive more sustainable production at scale.

Green bonds for sustainable soy production

In 2019, the Responsible Commodities Facility became the world's first facility offering green bonds for sustainable soy production in Brazil. Created in partnership with the UNEP and the UK Government's Partnerships for Forests programme, it aims to provide low-interest credit by to Brazilian soy and corn farmers who commit to avoid clearing forests and native grassland and instead farm on degraded pasture. An estimated 18 million ha of degraded pasture could be used for soy production in the Cerrado biome alone. The facility aims to provide US\$1 billion by 2023, funding over 180 million tonnes of soy and corn to 2030, whilst protecting or restoring 1.5 million ha of Brazil's Cerrado biome, reducing carbon dioxide emissions by 250 million tonnes .

Company-run sustainable financing initiatives

In 2018, Bunge launched a new financing mechanism providing long-term loans to soy farmers committed to halting native vegetation conversion in the Cerrado biome. Loans of up to 10 years are on offer, recognising the long-term payback times for investments in buying and preparing agriculture land. The project was developed in partnership with The Nature Conservancy and Santander Bank, piloting US\$50 of capital in 2018.

In 2019, Louis Drefus launched a similar scheme, with preferential long-term financing for producers committed to limit farm expansion to land that has already been cleared, rather than converting native vegetation in Brazil. Developed in collaboration with WWF, it requires producers to commit to halt native vegetation conversion, including vegetation that could be cleared legally and comply with local and national social and environmental legislation.

Figure 60: Sustainable innovation highlights

Company	Description	Score	Rank
AMAGGI	<ul style="list-style-type: none"> Expansion of agricultural activities in degraded or already open areas, and increase productivity per hectare, avoiding pressure on native forest areas. AMAGGI studies, develops and tests new seeds that can better adapt to different climatic conditions. Seed quality is seen as a priority, the company offers seeds with 85% to 90% germination. 	48	1
Louis Dreyfus	<ul style="list-style-type: none"> Preferential long-term financing line to incentivize producers to expand on already cleared areas, instead of converting native vegetation. The financing line has certain conditions attached and was developed in partnership with WWF. PRODES Cerrado and PRODES Amazon are used to monitor all land use conversion and a series of reference dates are applied to identify when clearance has taken place. 	46	2
Bunge	<ul style="list-style-type: none"> First-of-its-kind financing mechanism for soy farmers in Brazil's Cerrado region. The program promotes agricultural production without further deforestation or conversion of native vegetation, by providing long-term loans to farmers willing to commit to this approach. Bunge's use of Agroideal in its operations to identify opportunities and risks for future soy sourcing. 	34	3
Cargill	<ul style="list-style-type: none"> Cargill works with more than 15,000 soy farmers with varying levels of production capacity in Brazil to help them adopt agronomic best practices and achieve compliance with regulations. Partnership with Climate Ventures, a non-profit developing an ecosystem for green entrepreneurship. Climate Ventures is currently studying more than 500 climate-related start-ups at work in Brazil to help the most innovative ideas thrive. 	30	4
Marfrig	<ul style="list-style-type: none"> In 2019, Marfrig began to monitor hotspots (fires) in the Amazon Biome. This process was adopted in order to inform its suppliers about possible fires on their farms, alerting them to preventive actions on the properties. Launch of the first Rainforest Alliance certified hamburger made from meat produced according to the highest production, environmental, social and animal welfare management standards. 	26	5
ADM	<ul style="list-style-type: none"> Aliança da Terra, an agricultural-improvement program based in Latin America. Helping soybean producers in Brazil & Paraguay implement sustainable farming practices to reduce the pressure to expand into ecologically sensitive areas. ADM Cares grants target three focus areas that align with our purpose: advancing sustainable agriculture, increasing food security, and investing in education. 	26	6
COFCO	<ul style="list-style-type: none"> Contributed to the development of Agroideal, an innovative tool for mapping and facilitating sustainable soy production expansion in South America. Mejor Agro project in Paraguay, working with over 1,500 producers. The project applies a digital tool - "Rural Horizon" - to evaluate farm management on more than 100 sustainability indicators. 	19	7
JBS	<ul style="list-style-type: none"> The Company assesses 50,000 farms daily to avoid purchasing animals from properties involved with deforestation of old growth forests, invasion of indigenous lands and environmental preservation areas. The Company's goal for 2020 and beyond is to develop a project for reforestation of environmental liabilities in the Legal Amazon in partnership with its cattle suppliers and civil society organizations. 	17	8
Minerva Foods	<ul style="list-style-type: none"> Geospatial monitoring via satellite imaging is performed on the properties of suppliers located throughout the Amazon biome to determine the occurrence of deforestation, encroachment of indigenous lands, and into conservation areas. This commitment reaches out into Paraguay, where Minerva is pioneering geospatial monitoring of the Chaco biome. 	8	9
Glencore Agri	<ul style="list-style-type: none"> Glencore Agriculture, through its Brazilian operation Glencane Bioenergia, is conducting many projects to restore deforested areas near its operations. These projects protect watercourses from human activity, help to repair the impact in this region and recover fauna and flora. 	7	10

Source: CDP, company reports

Captial flexibility highlights

▼ Compared to the timber and palm oil companies, the soy and cattle companies operate with lower leverage. None of the companies operate with a net debt / EBITDA ratio of more than 4x.

▼ ADM convert a very small amount of its net income into free cash flow, an indication of the lower flexibility to invest in the business. Minerva's free cash flow is unusually high as net income was depressed following a year of negative earnings.

Figure 61: Company leverage and cash conversion

Company	Net Debt/EBITDA FY 2019
JBS	2.39
Bunge	2.86
Marfrig	2.94
ADM	2.98
Minerva Foods	3.43

Source: CDP, company reports

Company	Free cash flow conversion
ADM	-4.55
Bunge	1.04
JBS	1.57
Marfrig	7.54
Minerva Foods	93.81

Source: CDP, company reports

Deforestation governance & strategy

- Although all seven soy companies have set traceability targets these are limited to direct suppliers; no soy companies have set traceability goals covering their indirect supply chain.
- ADM leads the group. The company has the strongest sustainable production policy commitments and robust procedures for managing forest-related risks.
- Minerva Foods ranks last with relatively limited scope of the company's sustainable production policy commitments and performing last in sustainable sourcing targets.

Overview

The 2006 Amazon Soy Moratorium brought the issue of deforestation associated with soy production to the fore. Soy and cattle remain under the spotlight as key drivers of forest loss in South America, particularly following a rise in deforestation rates in Brazil in recent years.

Companies with robust governance of forest-related supply chain risks will be best positioned to capitalize on the shift to zero deforestation supply chains. Implementing strong commodity-specific policies setting out companies' no-deforestation commitments and expectations for suppliers is crucial for companies to demonstrate commitment to minimising deforestation risk exposure. Recognising forests' vital role in mitigating climate change, providing ecosystem services and supporting biodiversity, as well as their importance to indigenous and local community livelihoods, policy commitments should go beyond deforestation to cover a broad range of environmental and social aspects critical to sustainable soy and cattle supply chains.

Ensuring oversight of forest-related risks at board and executive levels and establishing robust risk management processes is imperative if companies are to demonstrate their readiness and commitment to achieving deforestation-free, sustainable supply chains. Many companies have set traceability and sustainable sourcing targets to quantify progress on sustainable production.

However, stronger action is needed – particularly around

companies' oversight and engagement with indirect suppliers – if companies are to signal to investors that they are committed to bringing about systemic changes in agricultural practices.

In this chapter we assess companies on their deforestation governance and strategy using four key metrics:

Metric 1) Policy commitments & memberships (40%): Companies are assessed on the strength of commitments to address deforestation and promote sustainable production in their commodity-specific policies and public disclosures, as well as their support for key sustainability initiatives.

Metric 2) Board level expertise and management (30%): Companies are assessed on a number of factors relating to board and executive deforestation responsibility performance, including the level of directors on the board with sustainability experience, the presence of sustainability-related committees at board and/or executive levels, and the overall quality of commodity-specific forest risk management systems.

Metric 3) Targets (20%): This metric aims to evaluate the strength of companies' deforestation-related targets.

Metric 4) CDP Forest ranking (10%): Companies are assessed according to their CDP Forests 2019 score. The CDP Score provides an aggregate measure of the quality of forest-related disclosure and management systems addressing forest-related risks.

Figure62: Deforestation governance & strategy summary

Company	Policy commitments & memberships	Board & executive level management	Targets	CDP Forest score (2019)	Overall weighted rank	Deforestation governance & strategy rank
ADM	1	2	6	B-	2.7	1
Bunge	6	3	2	B-	3.6	2
Louis Dreyfus	4	1	7	F	4.1	3
Marfrig	7	4	1	C	4.4	4
AMAGGI	5	8	3	A-	4.7	5
Cargill	3	9	4	C	5.4	6
COFCO	2	10	4	F	5.6	7
Glencore Agri	7	7	8	D	6.8	8
JBS	9	5	9	B / B ⁽ⁱ⁾	7.0	9
Minerva Foods	10	6	10	C	8.4	10

Weighting 40% 30% 20% 10%

Note: In calculating the weighted rank in this table, we use the weighted ranks for each area. We display non-weighted ranks in this summary for simplicity only.

(i) JBS scored a B for cattle and B- for Soy.

Policy commitments and membership highlights

- Soy companies' policies around sustainable production generally focus on deforestation risk regions in South America and adherence to key industry agreements, such as the Amazon Soy Moratorium.
- Cattle companies' policies also focus on South America but are more limited in scope, largely aligning with the Public Livestock Commitment. Signed by the three cattle companies in 2009, it commits them not to purchase cattle from farms involved in Amazon deforestation after October 2009 or located on indigenous lands and protected areas in the biome, among other criteria.
- Eight out of the 10 soy & cattle companies have zero deforestation commitments and two have net-zero commitments. Only three companies have commitments not to develop on HCV areas within their commodity-specific policies.
- ADM and COFCO rank first and second, respectively. The two companies have the strongest environmental and social policy commitments among the group and are members of several initiatives promoting sustainable soy, including the Cerrado Working Group, the Soy Working Group, and the Soft Commodities Forum (see Figure 63 and 64).
- Glencore Agriculture ranks last out of the soy companies. Although the company is a member of the Soft Commodities Forum and reports on the traceability of its soy supply chains in Brazil under the common reporting framework, it lacks a publicly available soy-specific sustainability policy and scores lowest in terms of memberships.
- Marfrig leads the three cattle companies with its Commitment announced in 2020 pledging to achieve zero deforestation throughout its supply chain by 2030, covering both the Amazon and Cerrado.

Figure 63: Sub-set of environmental and social policy criteria evaluated

Soy- and cattle specific policy commitments	ADM	COFCO	Cargill	Louis Dreyfus	AMAGGI	Bunge	Glencore Agri	Marfrig	JBS	Minerva Foods
Environmental										
Commodity-specific policy	Green	Green	Green	Green	Green	Green	Yellow	Green	Light Green	Light Green
Zero deforestation / zero net deforestation	Green	Light Green	Green	Green	Green	Green	Light Green	Green	Green	Green
No conversion of high conservation value areas	Green	Green	Red	Light Green	Green	Red	Light Green	Red	Red	Yellow
No conversion of high conservation stock areas	Green	Red	Red	Red	Green	Red	Light Green	Red	Red	Red
Biodiversity conservation	Light Green	Green	Green	Green	Light Green	Light Green	Light Green	Light Green	Green	Light Green
Improve water use intensity & quality	Yellow	Light Green	Green	Yellow	Light Green	Yellow	Yellow	Light Green	Yellow	Yellow
Social										
Respect indigenous and local communities' rights	Light Green	Green	Green	Light Green	Green	Green	Light Green	Green	Green	Green
Secure Free, Prior and Informed Consent (FPIC)	Green	Green	Green	Light Green	Green	Green	Light Green	Light Green	Yellow	Yellow
UN Declaration on Human Rights / UN Guiding Principles on Business and Human Rights	Light Green	Yellow	Light Green	Light Green	Yellow	Yellow	Light Green	Light Green	Light Green	Yellow
UN International Labour Organization principles	Light Green	Green	Light Green	Green	Yellow	Yellow	Light Green	Yellow	Yellow	Light Green

Source: CDP, company reports

Clear commitment in commodity-specific policy	Green
Evidence of commitment directly relating to commodity production	Light Green
Included in wider company policies	Yellow
Not included within commodity-specific policy; no direct link to commodity	Red

Figure 64: Soy memberships⁽ⁱ⁾

Company	UNGC	WBCSD	Tropical Forest Alliance	New York Declaration on Forests	Sustainable Agriculture Initiative	Cerrado Manifesto	Cerrado Working Group	Soy Moratorium	Soy Working Group	Soft Commodities Forum	Soja Plus Programme
ADM	✓	✓	✗	✗	✓	✗	✓	✓	✓	✓	✓
AMAGGI	✓	✗	✗	✗	✗	✗	✓	✓	✓	✗	✓
Bunge	✓	✓	✗	✗	✓	✗	✓	✓	✓	✓	✓
Cargill	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
COFCO	✓	✓	✓	✗	✗	✗	✓	✓	✓	✓	✓
Glencore Agri	✓	✓	✗	✗	✗	✗	✓	✓	✗	✓	✗
Louis Dreyfus	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓

(i) Companies are displayed in alphabetical order. Company scores for memberships are included in overall scores for the Policy commitments & memberships metric.

Source: CDP, company reports

Figure 65: Cattle memberships⁽ⁱ⁾

Company	UNGC	WBCSD	Tropical Forest Alliance	New York Declaration on Forests	Sustainable Agriculture Initiative	Global Roundtable for Sustainable Beef	Brazilian Roundtable on Sustainable Livestock	Public Livestock Commitment
JBS	✗	✗	✓	✗	✓	✓	✓	✓
Marfrig	✗	✗	✓	✗	✗	✓	✓	✓
Minerva Foods	✗	✗	✗	✗	✗	✓	✓	✓

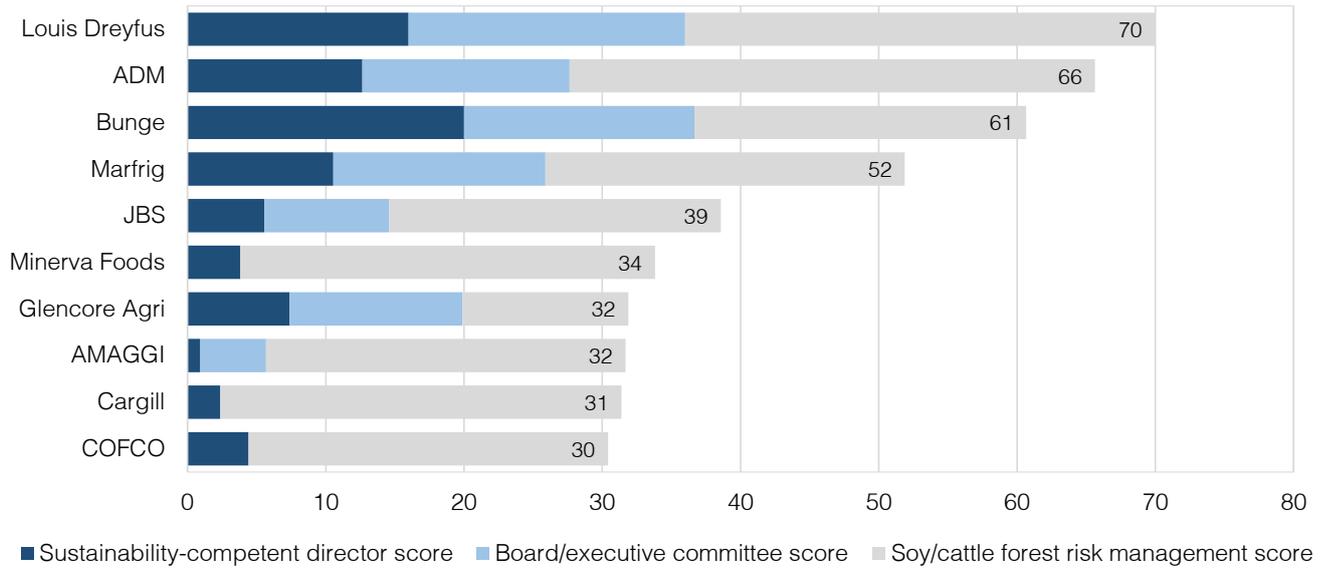
(i) Companies are displayed in alphabetical order. Company scores for memberships are included in overall scores for the Policy commitments & memberships metric.

Source: CDP, company reports

Board & executive level management highlights

- ✦ Louis Dreyfus Company leads the group (see Figure 66). The company has an executive-level Environment Committee with specific oversight of deforestation, conversion, and biodiversity, as well as having robust risk management processes and four of the company's six directors having low to medium levels of sustainability experience.
- ✦ COFCO ranks last, with no evidence of a sustainability committee at either board or executive level and just three of the company's 11 directors assessed as having very low to medium levels of sustainability experience.
- ✦ Of the 44% of directors assessed as having sustainability experience, just 7% were deemed to have high or very high levels of expertise. Only two companies – Archer Daniels Midland and Louis Dreyfus Company – assess forest-related risks as a standalone issue.

Figure 66: Board & executive level management

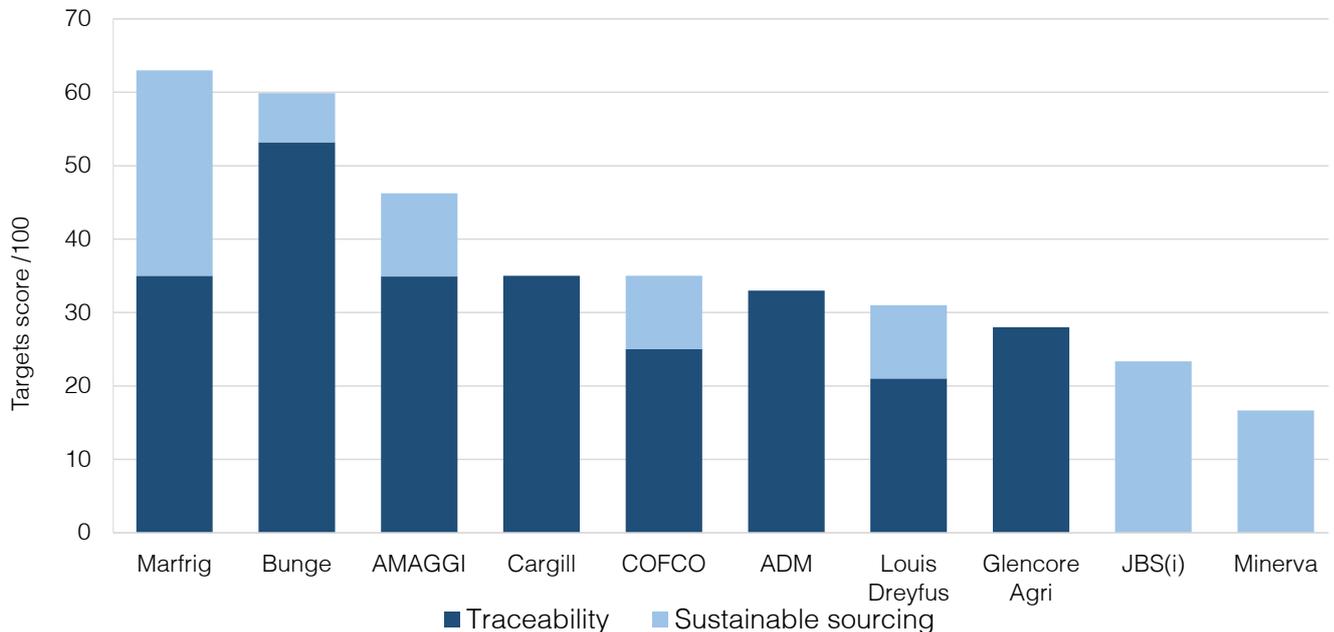


Source: CDP, company reports

Targets highlights

- ▼ Soy & cattle companies’ targets focus on traceability and sustainable sourcing. No third-party deforestation related certification standards exist for cattle producers, and while third-party certification is established for soy production, no companies have set related targets.
- ▼ Seven soy & cattle companies have set sustainable sourcing targets, which includes assessing supplier compliance with companies’ environmental and social criteria.
- ▼ All seven soy companies have set traceability targets, but these are limited to achieving traceability to farm for direct suppliers; no companies have set traceability goals covering their indirect supply chain (see Figure 67).
- ▼ Marfrig leads the group, having both a traceability target and an ambitious goal to achieve a sustainable and deforestation-free supply chain in the Amazon and Cerrado biomes by 2030, including both direct and indirect sourcing.
- ▼ Bunge rank second, leading the soy companies with its 2025 traceability target while also aiming to have 100% of indirect sourcing from deforestation risk areas of the Cerrado engaged with its non-deforestation policy by this date.
- ▼ JBS and Minerva Foods rank second last and last, respectively, with their sustainable sourcing targets covering direct suppliers only.

Figure 67: Soy & cattle deforestation-related target score



(i) JBS announced in October 2020, after this analysis took place, its JBS Green Platform, a blockchain platform that will enable the Company to track the suppliers of its cattle suppliers by 2025.

Source: CDP, company reports

Appendix I: Company engagement traffic light system

League Table rank	1	2	3	4	5	6	7	8	9	10	Weighting												
Companies	1	2	3	4	5	6	7	8	9	10	AMAGI	Louis Dreyfus	ADM	Bunge	Cargill	COFCO	Marfrig	Glencore Agri	JBS	Minerva Foods	Metric	Area	
Transition risks rank																							
Land use	1	2	7	10	4	6	5	3	8	9	3	2	4	6	1	5	8	7	9	10	10	40%	40%
Certification & traceability	1	3	5	7	4	8	2	6	10	9	7	2	4	5	3	1	8	6	9	10	10	40% (60%) ⁽ⁱ⁾	40%
	3	2	9	10	4	5	7	1	6	8	6	4	3	5	2	8	6	7	10	9	9	60% (40%) ⁽ⁱ⁾	60%
Transition opportunities rank																							
Low-carbon innovation	2	4	3	1	6	7	9	8	5	10	2	1	6	3	5	9	4	10	7	8	8	30%	30%
Capital flexibility	3	4	2	1	5	7	9	8	6	10	3	1	6	3	4	7	5	10	8	9	9	75% (70%) ⁽ⁱ⁾	75%
	4	5	6	n/a	n/a	2	7	1	3	8	3	1	2	5	6	n/a	2	n/a	1	3	3	25% (30%) ⁽ⁱ⁾	25%
Climate governance & strategy rank																							
Policy commitments & memberships	5	2	1	3	7	6	4	9	10	8	2	3	1	7	8	6	5	4	9	10	10	30%	30%
Board level expertise & management	3	2	1	5	4	7	6	9	10	8	2	3	1	6	4	5	7	8	9	10	10	40%	40%
Targets	6	4	5	7	9	3	2	8	10	1	3	6	4	7	5	8	2	1	9	10	6	30%	30%
CDP Forest Score	4	3	2	1	9	5	7	10	6	8	2	1	5	3	8	6	7	4	9	10	10	20%	20%
	6	1	4	2	7	5	3	8	8	8	1	9	4	3	7	9	5	8	2	6	6	10%	10%
Total																							
Green	4	3	4	4	1	1	3	2	1	1	2	4	2	1	2	1	2	1	0	1	0		
Yellow	4	4	2	0	4	5	1	0	2	0	6	2	6	5	2	3	2	3	2	2	2		
Orange	0	1	2	2	2	2	3	4	1	3	0	2	0	2	2	2	1	0	2	2	0		
Red	0	0	0	1	0	0	1	2	4	4	0	0	0	0	2	1	3	3	0	1	5		

Note: weighted ranks are calculated for each area. We display non-weighted ranks in this summary for simplicity only.

(i) Weighting for Soy / Cattle shown in brackets
Source: CDP

This heat map is designed to help investors pinpoint priority areas for engagement.

Green = good performance
Yellow = reasonable performance
Orange = monitor performance, possible concern
Red = area of concern, engage with company

We have not assigned a uniform number of green, yellow, orange and red colours across the metrics according to rank. Instead, we have reviewed the results of each metric in detail and assigned the above colours according to the underlying values for each metric.

Appendix II: Company summaries

Palm oil

FGV Holdings

Country: Malaysia

Average market cap Q2 2020: US\$ 4.0 bn

Revenue 2019: US\$ 3.2 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
FGV MK	10/10	9	10	8

Company strengths

- Leads in board level expertise. Five of the company's nine board members assessed as having sustainability expertise, including one director deemed to have a high level of experience. Also one of just two companies with a committee responsible for sustainability issues at both board and executive levels.

Company Weaknesses

- No visible investment in multi-stakeholder landscape collaboration. Most innovations at the company have been related to business as usual incremental solutions, ranking last in sustainable innovation.
- Ranks second last on land use, where less than 50% of land managed is certified.
- Ranks third last on traceability and certification, where traceability is low and RSPO certification of FFB supply to its own mills is just 15%.

First Resources Ltd.

Country: Singapore

Average market cap Q2 2020: US\$ 1.5 bn

Revenue 2019: US\$ 0.6 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
FR SP	9/10	8	5	10

Company strengths

- Although the company ranks sixth for sustainable innovation, two of its innovations related to peat and soil management practices were assessed as radical.

Company Weaknesses

- No evidence of a sustainability committee at either board or executive level and performing lowest in terms of director experience and forest-risk management procedures, ranking last in this metric.
- Also has weaker sustainable production policy commitments compared to its peers and is not a member of several key palm oil related sustainability initiatives, ranking last in Governance & Strategy.
- Ranks last on land use as none of the land managed or controlled by the company has been managed through scheme smallholders. Less than 10% of FFB sourced from smallholders and less than 10% of land managed certified by RSPO.

Kuala Lumpur Kepong

Country: Malaysia

Average market cap Q2 2020: US\$ 5.8 bn

Revenue 2019: US\$ 3.7 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
KLK MK	8/10	3	8	9

Company strengths

- Ranks first for traceability and certification, with smallholders supplying 24% of FFB to the company's mills, with all supply traceable to plantation of origin.

Company Weaknesses

- Ranks last in targets. Despite having targets for traceability to plantation for the company's own mills and refineries, there is no evidence the company has set targets for certification nor sustainable sourcing.
- Also has among the weakest sustainable production policy commitments of the group, ranking ninth overall in Governance & Strategy.
- Ranks eight for sustainable innovation with just 2 innovations considered to be radical or transformational. Many of its top innovations have focused on incremental or evolutionary programmes relating to sustainable production techniques and smallholder capacity building.

Olam International

Country: Singapore

Average market cap Q2 2020: US\$ 3.1 bn
Revenue 2019: US\$ 24.2 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
OLAM SP	7/10	5	9	4

Company strengths

- One of just two companies that have a committee responsible for sustainability issues at both board and executive levels, ranking second in board & executive level management.

Company Weaknesses

- Ranks last in smallholder inclusion at mill level with just 1% of FFB sourced from smallholders.
- Ranks sixth for policy commitments & memberships, and is the only company with the weaker zero-net deforestation instead of zero deforestation commitment.
- Ranks second last in sustainable innovation with just one innovation considered to be radical or transformative. Six of these innovations are considered incremental and include basic traceability and supply chain monitoring initiatives.

IOI Corporation Bhd

Country: Malaysia

Average market cap Q2 2020: US\$ 6.4 bn
Revenue 2019: US\$ 1.8 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
IOI MK	6/10	6	7	6

Company strengths

- 93% of FFB supply to company mills is RSPO certified.
- Has an executive level sustainability committee and half of its board members assessed as having sustainability expertise, ranking third in board & executive level management.

Company Weaknesses

- Ranks second last on smallholders supply, with smallholders supplying just 1% of FFB to company's mills.
- Ranks second last on land use, where the proportion of land managed set aside for smallholder schemes or conservation is one of the lowest in the group. None of the land managed by the company through scheme smallholders has been certified by the RSPO. Ranks seventh in sustainable innovation, with 8 of its top 10 innovations considered incremental or evolutionary.

Cargill

Country: United States

Average market cap Q2 2020: NA
Revenue 2019: US\$ 114.6 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
3091Z US	5/10	4	6	7

Company strengths

- Largest proportion of land managed through scheme smallholders who are structurally bound by contract to a mill owned by the company.
- Working with the government in Musi Banyuasin, South Sumatra and IDH to develop a Verified Sourcing Area (VSA) landscape program to certify that all produce generated from VSA areas meets stringent guidelines, an innovation considered transformative.

Company Weaknesses

- Ranks ninth for board & executive level management with a low number of directors deemed to have sustainability experience and limited evidence of an internal board- or executive-level sustainability committee.
- Ranks ninth in targets, with its 2020 traceability target less than 50% complete and no evidence of targets for third party certification.

PT Musim Mas

Country: Singapore

Average market cap Q2 2020: NA

Revenue 2019: US\$ 7.5 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
0676250D SP	4/10	10	1	3

Company strengths

- ▾ Ranks first in sustainable innovation with eight of its top 10 innovations considered to be radical or transformative. The company is involved in multiple landscape initiatives across Indonesia.
- ▾ Ranks top in sustainable target setting, targeting full supply chain traceability to plantation by 2025 while also aiming for 100% third party certification for own operations and associated scheme smallholders by 2022.

Company Weaknesses

- ▾ Ranks last in traceability and certification as the company, where the company does not have full traceability of FFB supply to plantation of origin and just 3% of FFB to the company's mills from smallholders.

Wilmar International

Country: Singapore

Average market cap Q2 2020: US\$ 21.8 bn

Revenue 2019: US\$ 42.6 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
WIL SP	3/10	7	3	1

Company strengths

- ▾ Ranks second in sustainable innovation, with 5 radical/transformational innovations. Part of the Sabah Jurisdictional Certification Steering Committee (JCSC), which aims to help the Sabah government to achieve its vision of producing 100% RSPO certified sustainable palm oil by 2025.
- ▾ Ranks top in terms of sustainable production policy commitments. In addition to its NDPE commitment, the company also scores highly for other environmental aspects such as responsible water use and protecting water quality.

Company Weaknesses

- ▾ Ranks 16th in product efficiency. The company's average Ranks second last in certification and traceability as supply of FFB from smallholders only account for 5% of supply, and only 5% of palm oil and palm oil product uptakes is RSPO certified.

Golden Agri-Resources

Country: Singapore

Average market cap Q2 2020: US\$ 1.4 bn

Revenue 2019: US\$ 6.4 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
GGR SP	2/10	2	4	2

Company strengths

- ▾ Has comprehensive sustainable production policy commitments and is a member of several palm oil related sustainability initiatives, including the High Carbon Stock Approach Steering Group and HCV Resource Network, performing second in this metric.
- ▾ Ranks fourth for innovation, with five out of Top 10 innovations considered either radical or transformative.

Company Weaknesses

- ▾ One of three companies where less than 50% of land managed or controlled by the company is RSPO certified.

Sime Darby Plantation

Country: Malaysia

Average market cap Q2 2020: US\$ 8.3 bn
Revenue 2019: US\$ 2.9 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
SDPL MK	1/10	1	2	5

Company strengths

- ▼ Ranks top on land use, where RSPO certification of land managed or controlled by the company is high at 98% of company-owned estates and 78% of scheme smallholder estates.
- ▼ Ranks third in certification and traceability, where 66 out of 67 mills operated certified by RSPO, 62% of palm oil and palm oil product uptake is RSPO certified.
- ▼ Part of a coalition of ten major palm oil producers and buyers to support and fund the development of a new, publicly available radar-based forest monitoring system known as Radar Alerts for Detecting Deforestation (RADD), ranking third for sustainable innovation.

Company Weaknesses

- ▼ Ranks second from bottom for the proportion of land managed for conservation, with just 6.6% of the land managed or controlled by the company set aside for this purpose.

Timber

International Paper

Country: United States

Average market cap Q2 2020: US\$ 16.8 bn
Revenue 2019: US\$ 22.4 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
IP US	8/8	8	6	4

Company strengths

- ▾ The company ranks fourth in governance & strategy, with sustainability-related committees at both board and executive level and a relatively high levels of sustainability expertise among its directors.
- ▾ Ranks sixth for transition opportunities, with innovations including an initiative tackling illegal logging globally, and another reducing emissions from logging with better harvesting practices in Gabon and Indonesia.

Company Weaknesses

- ▾ Ranks last in transition risks, with the smallest area of land owned or under long-term lease and the smallest proportion of land set aside for conservation at 0.4%.
- ▾ Only 38% of its total timber supply is certified to FSC or PEFC standards, the lowest level of certification amongst the group.
- ▾ Ranks last for policy commitments and membership. While the company has high levels of certification of its owned/managed operations and a relatively comprehensive policy covering fibre procurement, specific policy commitments around sustainable production of its owned/managed operations are not as comprehensive as its peers.

Weyerhaeuser

Country: United States

Average market cap Q2 2020: US\$ 22.1 bn
Revenue 2019: US\$ 6.6 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
WY US	7/8	4	8	5

Company strengths

- ▾ The company ranks fourth for transition risks with over 25 million hectares of land owned or under long-term lease across North America, by far the largest within the sample.
- ▾ 22% of the land it owns or leases is set aside for conservation purposes, equating to around 5.5 million hectares, the largest absolute conservation area of the group.

Company Weaknesses

- ▾ Ranks last in transition opportunities with small-scale innovations tackling local sustainable forestry issues, protecting wildlife and waterway management programmes across the US.
- ▾ The only company not demonstrating any investment in circular economy innovations and the lowest free cash flow conversion of the group.
- ▾ One of only two companies not using FSC certification standards.

Asia Pulp & Paper

Country: Indonesia

Average market cap Q2 2020: NA
Revenue 2019: US\$ 3.3 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
1193Z SP	6/8	3	7	6

Company strengths

- ▾ The company ranks third for transition risks. 88% of its total timber supply is certified to PEFC standards, the second highest level of the group.
- ▾ Sources 96% of its timber from land it owns or leases long-term, the highest proportion of the group, providing more opportunities to directly manage deforestation risk.

Company Weaknesses

- ▾ One of only two companies not using FSC certification standards. FSC has disassociated from Asia Pulp & Paper because of alleged damaging forest management practices.
- ▾ Performs poorly for transition opportunities, investing largely in more basic biodiversity conservation initiatives with very few circular economy innovations.

Suzano

Country: Brazil

Average market cap Q2 2020: US\$ 12.0 bn
Revenue 2019: US\$ 6.6 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
SUZB3 BZ	5/8	2	3	8

Company strengths

- ▼ The company ranks second for transition risks, with 39% of its land set aside for conservation, the highest proportion among the group.
- ▼ Ranks third for transition opportunities with a host of sustainable innovations aimed at improving the sustainability and biodiversity of their forestry operations, whilst supporting rural livelihoods.

Company Weaknesses

- ▼ Ranks last in governance & strategy with no evidence of targets around third-party certification of its timber supply, traceability, or ecosystem conservation and restoration.
- ▼ Converts a very small amount of their net income into free cash flow, an indication of less flexibility to invest in the business.

Empresas CMPC

Country: Chile

Average market cap Q2 2020: US\$ 5.2 bn
Revenue 2019: US\$ 5.7 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
CMPC CI	4/8	1	4	7

Company strengths

- ▼ Ranks first for transition risks, with 93% of its total timber supply certified to FSC or PEFC standards, the highest proportion of the group and sourcing 82% of its timber from land it owns or leases long-term.
- ▼ 27% of the land it owns or leases is set aside for conservation, the second highest proportion of the group.

Company Weaknesses

- ▼ Performs poorly for governance & strategy. Despite performing third in the targets metric, the company showed limited evidence of comprehensive, specific sustainable forestry policy commitments for its suppliers.
- ▼ Ranks second last for board and executive level management, with no evidence of an executive-level committee managing sustainability and deforestation issues.

Mondi Plc

Country: United Kingdom

Average market cap Q2 2020: US\$ 10.5 bn
Revenue 2019: US\$ 8.1 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
MNDI LN	3/8	5	5	1

Company strengths

- ▼ The company ranks first for governance & strategy and leads the group for policy commitments and membership, with commitments to zero deforestation and no conversion of HCV areas in its own operations and supply chain.
- ▼ 100% of the company's timber supply grown on land it owns or leases long-term is produced to FSC or PEFC standards.
- ▼ One of the few companies to demonstrate investment supporting small-scale timber suppliers, providing seedlings, training and purchasing contracts to 3,200 1-2 hectare growers in South Africa.

Company Weaknesses

- ▼ Only 22% of the company's timber supply is grown on land it owns or leases long-term, with the rest procured externally. Reduces ability to directly manage deforestation risk within its supply chain.
- ▼ Fails to demonstrate evidence of targets for traceability or sustainable sourcing and has not signed up to the New York Declaration on Forests.

UPM

Country: Finland

Average market cap Q2 2020: US\$ 16.6 bn
Revenue 2019: US\$ 11.5 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
UPM FH	2/8	7	1	3

Company strengths

- ▶ The company ranks first for transition opportunities, with a range of sustainable forestry innovations, including increasing forests' biodiversity, reducing the environmental impact of harvesting and improving forests' capacity to adapt to climate change.
- ▶ Ranks third for governance & strategy and ranks first for targets. One of two companies with targets covering all four key deforestation-related areas and has set an ambitious target to have 100% of its wood from third-party certified sources by 2030.
- ▶ 82% of its total timber supply is certified to PEFC or FSC standards, the third highest level of the group.

Company Weaknesses

- ▶ Performs poorly for transition risks, with only 14% of the company's timber supply grown on land it owns or leases long-term, the lowest level of the group.
- ▶ 14% of the land it owns or leases is set aside for conservation, below average for the group, indicating that more action is needed to conserve biodiversity within its forests.

Stora Enso

Country: Finland

Average market cap Q2 2020: US\$ 13.3 bn
Revenue 2019: US\$ 11.3 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
STERV FH	1/8	6	2	2

Company strengths

- ▶ The company ranks second for transition opportunities, with innovations including developing a pilot plant to produce bio-based carbon at its Sunila Mill in Finland, producing synthetic graphite which can be used in lithium-ion batteries.
- ▶ Ranks second for governance & strategy and ranks second for targets, with targets covering all four key areas.
- ▶ Other innovations include removing unexploded bombs from eucalyptus plantations in Laos enabling farmers to grow crops safely between trees and reducing forest fires from shifting cultivation.

Company Weaknesses

- ▶ 12% of the land it owns or leases is set aside for conservation, the second lowest level for the group, indicating that more action is needed to conserve biodiversity within its forests.
- ▶ All of the company's target dates have expired, highlighting the need to set more ambitious time-bound goals.

Soy & Cattle

Minerva Foods

Country: Brazil

Average market cap Q2 2020: US\$ 1.1 bn
Revenue 2019: US\$ 4.3 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
BEEF3 BZ	10/10	10	8	10

Company strengths

- ▶ Ranks fourth for capital flexibility with the highest free cash flow among the group.
- ▶ Ranks sixth in board & executive level management, with some evidence of directors with sustainability experience and relatively robust procedures for assessing forest-related risks.

Company Weaknesses

- ▶ With no evidence of traceability of direct supply beyond the fattening farm level and the highest tree loss to production ratio among the cattle & soy companies, the company ranks last for Transition Risks.
- ▶ The company ranks ninth for sustainable innovation with all but one of its innovations assessed as incremental.
- ▶ Ranks last in Governance & Strategy with relatively limited scope of its sustainable production policy commitments and targets.

JBS

Country: Brazil

Average market cap Q2 2020: US\$ 9.3 bn
Revenue 2019: US\$ 51.9 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
JBSS3 BZ	9/10	9	7	9

Company strengths

- Rank fifth in board & executive level management, having a board level sustainability committee and several directors deemed to have sustainability experience.
- Two of its top 10 innovations were considered radical, with the company ranking seventh in Transition Opportunities.

Company Weaknesses

- Relatively limited scope of its sustainable production policy commitments and targets means the company ranks second last in Governance & Strategy.
- Ranks second last for Transition Risks. Company has a high tree loss to production ratio – although being lowest of the cattle companies – and shows no evidence of direct supply traceability beyond the fattening farm level.

Glencore Agriculture

Country: Netherlands

Average market cap Q2 2020: NA
Revenue 2019: US\$ 25.1 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
6921741Z AU	8/10	7	10	8

Company strengths

- Has an executive-level sustainability committee as well as several directors deemed to have sustainability expertise, ranking seventh in board & executive level management.
- Able to trace 62% of its direct suppliers in Brazil. Over 90% of Glencore's soy from Argentina, is sourced from areas at very low risk of deforestation, from states outside the Argentine Gran Chaco.

Company Weaknesses

- The lowest performing soy company for Transition Risks, with the second highest tree loss to production ratio in Brazil and incomplete disclosure of the proportion of supply from indirect suppliers.
- Ranks bottom for sustainable innovation, with all but one of its innovations assessed as incremental.
- Relatively weak soy specific sustainable production policy commitments and sustainable sourcing targets means the company ranks third from last for Governance & Strategy.

Marfrig

Country: Brazil

Average market cap Q2 2020: US\$ 1.8 bn
Revenue 2019: US\$ 8.9 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
MRF3 BZ	7/10	8	4	4

Company strengths

- Has a traceability target as well as a goal to achieve a deforestation-free supply chain in the Amazon and Cerrado by 2030, including both direct and indirect sourcing, ranking top for targets.
- Ranks fourth in Transition Opportunities, being the highest ranked cattle company for sustainable innovation and ranking second for capital flexibility.
- Ranks fourth for board & executive level management, having a director with a very high level of sustainability expertise and a board level sustainability committee.

Company Weaknesses

- Ranks eighth for Transition Risks with the second highest tree loss to production ratio out of the soy and cattle companies in Brazil.
- Although performing best out of the cattle companies, relatively limited scope of sustainable production policy commitments means the company ranks seventh overall for policy commitments & memberships.

COFCO International

Country: China

Average market cap Q2 2020: NA

Revenue 2019:

NA

US\$ 31.0 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
1070Z CH	6/10	5	9	7

Company strengths

- Has the lowest tree loss trend score and a low tree loss to production intensity in Paraguay, ranking top for the land use metric.
- Ranks second for policy commitments & memberships with among the strongest sustainable production policy commitments and membership of several sustainable soy initiatives.

Company Weaknesses

- With incomplete disclosure of direct supplier traceability, certified volumes, and the proportion of supply from indirect suppliers, ranks eight for certification, traceability & procurement.
- No evidence of a sustainability-related committee at board or executive level and relatively limited sustainability expertise among directors means the company ranks last in board & executive level management.
- With both a 2023 target to achieve full traceability to farm of directly sourced soy in Brazil and a sustainable sourcing target, the company ranks fourth in this metric.

Cargill

Country: United States

Average market cap Q2 2020: NA

Revenue 2019:

NA

US\$ 114.6 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
3091Z US	5/10	1	5	6

Company strengths

- Ranks second for traceability, certification & procurement, providing good disclosure of direct supplier traceability & proportion of indirect supply in South America.
- Also has the lowest tree loss to production ratio among the soy companies in Argentina and Paraguay, ranking third for land use and first overall for Transition Risks.
- Third in policy commitments & membership, with relatively strong sustainable production policy commitments and membership of several sustainable soy initiatives.

Company Weaknesses

- With eight of its top 10 innovations considered incremental or evolutionary and none assessed as transformative, the company ranks fifth for Transition Opportunities.
- Ranks ninth for board & executive level management with a low number of directors deemed to have sustainability experience and limited evidence of an internal board- or executive-level sustainability committee.

Bunge

Country: United States

Average market cap Q2 2020: US\$ 7.1 bn

Revenue 2019:

US\$ 7.1 bn

US\$ 41.1 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
BG US	4/10	6	3	2

Company strengths

- Ranks third for sustainable innovation, with its sustainable financing program designed to promote agricultural production without further deforestation considered transformative.
- Has several directors deemed to have sustainability experience and a sustainability committee at board level, performing third in board & executive level management.
- Ranks second for targets with its 2025 traceability target and goal to have 100% of indirect sourcing from deforestation risk areas of the Cerrado engaged with its non-deforestation policy.

Company Weaknesses

- Incomplete disclosure of direct supplier traceability and the proportion of supply from indirect suppliers mean the company ranks fifth in certification, traceability & procurement.
- Fourth highest tree loss risk score and second highest tree loss to production ratio in Paraguay, ranking fifth in the land use metric.
- Ranks sixth for policy commitments & memberships with weaker sustainable production policy commitments compared to many of its peers.

Archer Daniels Midland

Country: United States

Average market cap Q2 2020: US\$ 27.2 bn
Revenue 2019: US\$ 64.7 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
ADM US	3/10	4	6	1

Company strengths

- Rank first for Governance & Strategy, with the strongest sustainable production policy commitments and robust procedures for managing forest-related risks.
- Discloses the level of traceability of direct suppliers in several regions of Brazil and volumes certified under third party schemes, ranking third for certification, traceability & procurement.
- Rank fourth for land use, with the third lowest tree loss trend risk score and tree loss to production ratio in Brazil.

Company Weaknesses

- With six of its top 10 innovations assessed as incremental and none as transformative, the company performs sixth for sustainable innovation.
- Rank sixth for targets, with the company's traceability target including just the 25 priority municipalities identified by the SCF and covering direct suppliers only.

Louis Dreyfus Company

Country: Netherlands

Average market cap Q2 2020: NA
Revenue 2019: US\$ 33.6 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
0308213D NA	2/10	2	2	3

Company strengths

- Low tree loss to production intensity in Brazil and a large proportion of soy production sourced from Argentina where tree loss is lower, ranking second for the land use metric.
- Rank second for sustainable innovation, with its long-term financing line to incentivize producers to expand on already cleared areas considered transformative.
- Has an executive-level committee with oversight of deforestation, conversion & biodiversity and robust risk management, ranking first for board & executive level management.

Company Weaknesses

- Rank seventh for targets with its goal to trace 50% of soy in Brazil to farm applying to direct suppliers only, with a focus on higher-risk areas.
- Relatively low levels of traceability to farm level in Brazil and incomplete disclosure of the proportion of supply from indirect suppliers, ranking fourth for certification, traceability & procurement.

AMAGGI

Country: Brazil

Average market cap Q2 2020: NA
Revenue 2019: US\$ 4.4 bn

Ticker	League Table rank	Transition risks rank	Transition opportunities rank	Deforestation governance & strategy rank
3382980Z BZ	1/10	3	1	5

Company strengths

- Rank top for certification, traceability & procurement, tracing almost 100% of direct suppliers and disclosing volumes certified as well as the proportion of supply from indirect suppliers.
- Rank top for sustainable innovation with a suite of evolutionary and radical innovations being applied across South America, including its ORIGINAR geospatial analysis platform.
- With goals including tracking 100% of direct suppliers and evaluating 100% of grain suppliers according to its socio-environmental criteria, company ranks third for targets.

Company Weaknesses

- With close to 40% of soy production sourced from areas deemed to be high risk or extremely high risk over a 10 year period, ranks seventh for land use.
- Rank eighth for board & executive level management, with a low number of directors deemed to have sustainability experience and performing in the bottom half of the group for forest risk management.

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