

Cultivating Transparency

**Analysing sustainability risk
disclosure in the crop protection
and fertiliser sectors**



November 2025

Contents

Executive summary	3
Investor call to action	4
Introduction	5
Methodology	7
Results	8
What do companies actually say?	14
Conclusions	19
 Appendix – detailed methodology	 20
Disclaimer	25
About Planet Tracker	26

Executive summary

Fertiliser and crop protection companies are a central part of global food production. However, there is growing acknowledgement that their businesses are exposed to a range of sustainability-related risks. These range from eutrophication, to impacts on biodiversity, to greenhouse gas emissions to potential impacts on human health from toxic products. The companies face increasing regulatory scrutiny, reputational risk and consumer pressure. Understanding these risks and working to mitigate them is essential for the long-term performance of these companies and should be a key point of focus for management teams and their investors.

In this report, Planet Tracker searched the company filings of 20 of the largest fertiliser and crop protection producers globally (with aggregate revenues of USD 258 billion) for evidence that they are highlighting sustainability-related risks to investors and other stakeholders.

This analysis used Large Language Models (LLMs) to search more than 1,900 documents including regulatory filings, investor meeting transcripts, annual reports and sustainability reports over a 5-year period (2020-24).

Our analysis found significant variation in the level of disclosure of the core sustainability risks that we targeted in our analysis. For some issues such as water pollution, there was good coverage with most corporates highlighting the risk. However, other issues such as impacts from eutrophication or on soil fertility were largely unconsidered.

Risks which are topical, considered more immediate, or more tangible were, unsurprisingly, more discussed than risks considered longer-term or less tangible. For instance, risks that could come into scope for litigation claims, new regulation or remediation costs within the investment horizon are likely to be higher on investors' radars. As a result, they have a clearer incentive to drive corporates to address these financially material risks. We caution that what is a theoretical risk and/or considered an externality today could become a cost tomorrow as regulations and market expectations change.

A database of the risk disclosures analysed is available via our website – [link](#).



Investor call to action

Financial institutions have a crucial role to play in encouraging food system companies to address the harms of their business models and move towards more sustainable practices. Pushing this sustainable transition will help improve the resilience of the food system as a whole and help to secure the role of these companies in that transition.

Investors can help drive this sustainable transition whilst also reducing their own risk by engaging with corporates to improve their disclosure of core risks and impacts and develop strategies to address them. Asking corporate management teams to incorporate sustainability linked risks and impacts into their disclosures and strategies helps push these issues towards greater attention. Highlighting the importance of these issues as financially relevant to investors will encourage corporates to mitigate these risks and impacts, reducing the harms associated with their business models. At the same time, investors will benefit by reducing the risk exposure of their investee companies.

We call on investors to ensure that corporates in the fertiliser and crop protection markets include salient sustainability risks in their internal risk management processes and disclose the results and their mitigation strategies in their reporting. Where possible, this should include details of the potential financial materiality of these risks and how these numbers have been determined.



Introduction

Different ways to talk about risks

Typically, corporates are required to disclose the pertinent risks to their business in their financial reporting. Disclosure of sustainability risks by companies is increasing, and it is becoming common to see materiality matrices included that rate different risk factors for their perceived potential impact on both the business and broader stakeholders. However, detailed discussion of sustainability risks is often captured in a dedicated sustainability report, with limited integration of those risks into the discussion of business or financial risks.

Sustainability risk for fertiliser and crop protection corporates

In this report we look at sustainability-linked risks for the crop protection and fertiliser industries. We propose a range of risk areas we believe are material to the industries and examine their current reporting to see how, and to what extent, corporates in these industries currently discuss these risks.

Table 1 lists both the major fertiliser producers and the major crop protection producers included in our analysis based on the size of their revenues, per FactSet financial data and analytics. An initial screen was refined based on industry sources, whether the company was public and the availability of corporate documents.

*Table 1: The 20 corporates Included in our analysis.
Source: corporate reports, factset financial data and analytics.*

Fertiliser			Crop protection		
Company	Country	Revenue USD m	Company	Country	Revenue USD m
CF Industries Holdings	US	5,936	ADAMA	IL	3,736
Fertiglobe	AE	2,009	BASF	DE	70,591
Grupa Azoty Zakłady Azotowe Pulawy	PL	3,279	Bayer Crop Science	IN	54,701
ICL Group	IL	6,841	Corteva	US	16,908
Nutrien	CA	25,972	FMC Group	US	4,246
PhosAgro PJSC	RU	5,468	Syngenta AG	CH	12,711
SABIC Agri-Nutrients	SA	2,948	Tessenderlo Group	BE	2,864
Scotts Miracle-Gro	US	3,413	UPL	IN	5,168
Sociedad Química y Minera de Chile	CL	4,489	Zhejiang Xinan Chemical Ind Group	CN	2,029
The Mosaic Company	US	11,123			
Yara International	NO	13,868			

Why 'fertilisers' and 'crop protection'?

We focused on manufacturers of fertilisers and crop protection products as key parts of the food system, where there is increasing recognition of the negative environmental and broader sustainability impacts their products can have.

For fertilisers, one of the most significant of these risks is eutrophication of freshwater and marine ecosystems, where fertiliser run-off from farmland causes nutrients such as nitrogen and phosphorus to build up in waterways, leading to algal blooms and excessive plant growth which can destroy aquatic ecosystems. Synthetic fertiliser production and use is also responsible for approximately 5% of global greenhouse gas (GHG) emissions, and fertiliser misuse on farms leads to nitrous oxide (N₂O) air pollution causing acid rain and smog.

There is significant over-use of fertilisers^a, particularly in wheat, maize and rice production. This over-use is exacerbated by sub-optimal application (wrong time or form). The current use of nitrogen, a core chemical component of fertiliser, exceeds the safe environmental limit (planetary boundary) by 2 to 3 times.

Planet Tracker's *'Fixing Nitrogen'* report highlights the environmental damage caused by nitrogen fertilisers, with resulting financial risks for investors in companies that produce those. The report also highlights potential solutions that governments, companies, and financial institutions can invest in to reduce synthetic fertiliser misuse, while continuing to feed a growing population.

For crop protection products, there is increasing awareness of their potential toxicity beyond their target organisms and the harm this can cause to broader ecosystems and potentially human health.

Planet Tracker's *'Novel Entities'* emphasised how humanity has likely breached the planetary boundary for the creation and use of novel chemical entities and the potential negative impacts these can have on environmental and human health. The potential risk to investors is exemplified by Bayer, which has paid out litigation costs of €13 billion in the last 5 years related to its glyphosate herbicide (see our report - *Is Bayer a litigation leading indicator?*) in legal cases that are continuing.

Use of fertilisers and crop protection products has also been suggested to degrade soil quality over time and thus reduce crop yields over the long-term. That could drive up food prices with potential negative impacts for the global economy and financial assets.

^a *Cropland nutrient balance (Global, regional and country trends, 1961–2022)*

Methodology

We interrogated corporate documents to understand how they discussed sustainability-linked risks across 18 areas. Some of these risks were specific to either fertilisers or crop protection and were analysed accordingly – we ended up with 14 risks for each sector, 4 specific to the sector and 10 common across both sectors. We grouped these risks into four broad areas; Environmental; Health; Market; and Regulatory. See Table 2 for a summary of the types of risks analysed and how they were categorised in the analysis.

We used two independent, bespoke LLM-based data pipelines to extract, analyse and score company disclosures, with several human verification steps along the way. Building two independent pipelines allowed us to compare and contrast results, providing an additional layer of review.

We treated a company as disclosing a given risk where it described the issue as a business risk and/or commented on its financial materiality. We also counted as positive evidence cases where a company discussed mitigating actions (for instance, deploying sustainable practices to reduce pollution), even if it did not explicitly label the underlying issue as a risk.

We provide a more detailed methodology in the Appendix to this report.

Table 2: The risk questions used in the analysis. Source: Planet Tracker.

Risk summary	Type	Relevant sectors
Pesticide resistance	Market risk	Crop protection
Demand destruction by organic farming and alternatives	Market risk	Crop protection/fertilisers
Negative public perception of chemical-intensive agriculture	Market risk	Crop protection/fertilisers
High energy input costs	Market risk	Fertilisers
Soil degradation	Environmental risk	Fertilisers
Soil fertility loss	Environmental risk	Crop protection
Waterway pollution and contamination from leaching of applied products	Environmental risk	Crop protection/fertilisers
Eutrophication from nutrient runoff	Environmental risk	Crop protection/fertilisers
Disposal of chemical waste, such as gypstacks	Environmental risk	Fertilisers
Restoration of mining sites	Environmental risk	Fertilisers
Restoration of contaminated manufacturing sites	Environmental risk	Crop protection/fertilisers
Loss of pollinators and beneficial insects	Environmental risk	Crop protection
Human health problems from products	Human health risk	Crop protection/fertilisers
Factory workplace hazards	Human health risk	Crop protection
Carbon costs	Regulatory risk	Crop protection/fertilisers
Products being banned from being produced or sold	Regulatory risk	Crop protection/fertilisers
Rising compliance, testing, registration or re-registration costs	Regulatory risk	Crop protection/fertilisers
Class action lawsuits and legal challenges from health/environmental claims	Regulatory risk	Crop protection/fertilisers

Trends in risk disclosures over time

The first part of our analysis examined how corporates' discussion of our target risks has changed over time. We examined the period from 2020 to 2024.

Risk disclosure is increasing

In general, we have seen a pattern of slowly increasing discussion of our target risks across the period. We give each corporate one point for each of our target risks it discussed per year, with the results shown in Figure 1. We use a normalised scale, where 1 means every corporate is talking about every target risk in the year and 0 means no discussion by any corporates of any target risks in that year.

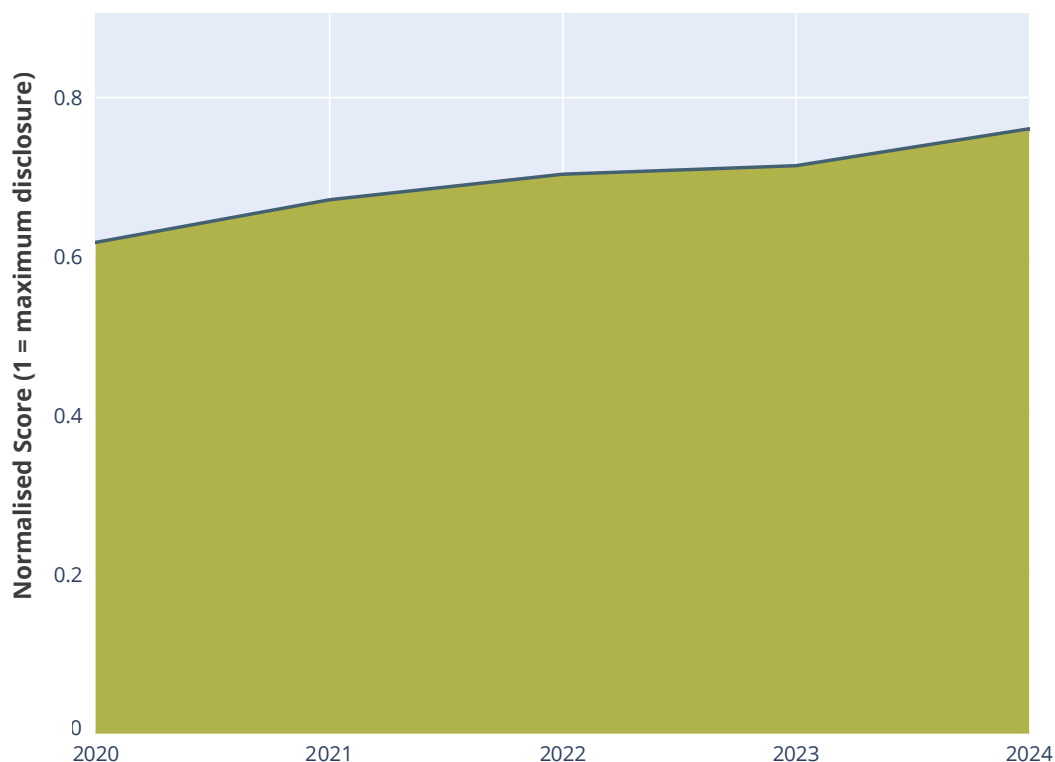


Figure 1: We have seen a steady rise in the level of disclosure across the period we analysed. Source: Planet Tracker.

On the surface, these results look good, with around three quarters of the possible disclosures noted in 2024. However, we note that this simple analysis includes a broad definition of what counts as discussing the topic. In some cases, this could include full details of the financial materiality of the topic. In other cases, it might be a more high-level discussion of the potential impact, which might even be framed as a positive opportunity (page 9).

Risk disclosure type and volume vary annually

This overarching trend for the group hides divergent patterns across the individual corporates. In Figure 2 we show the scores for 2024 for each corporate individually.

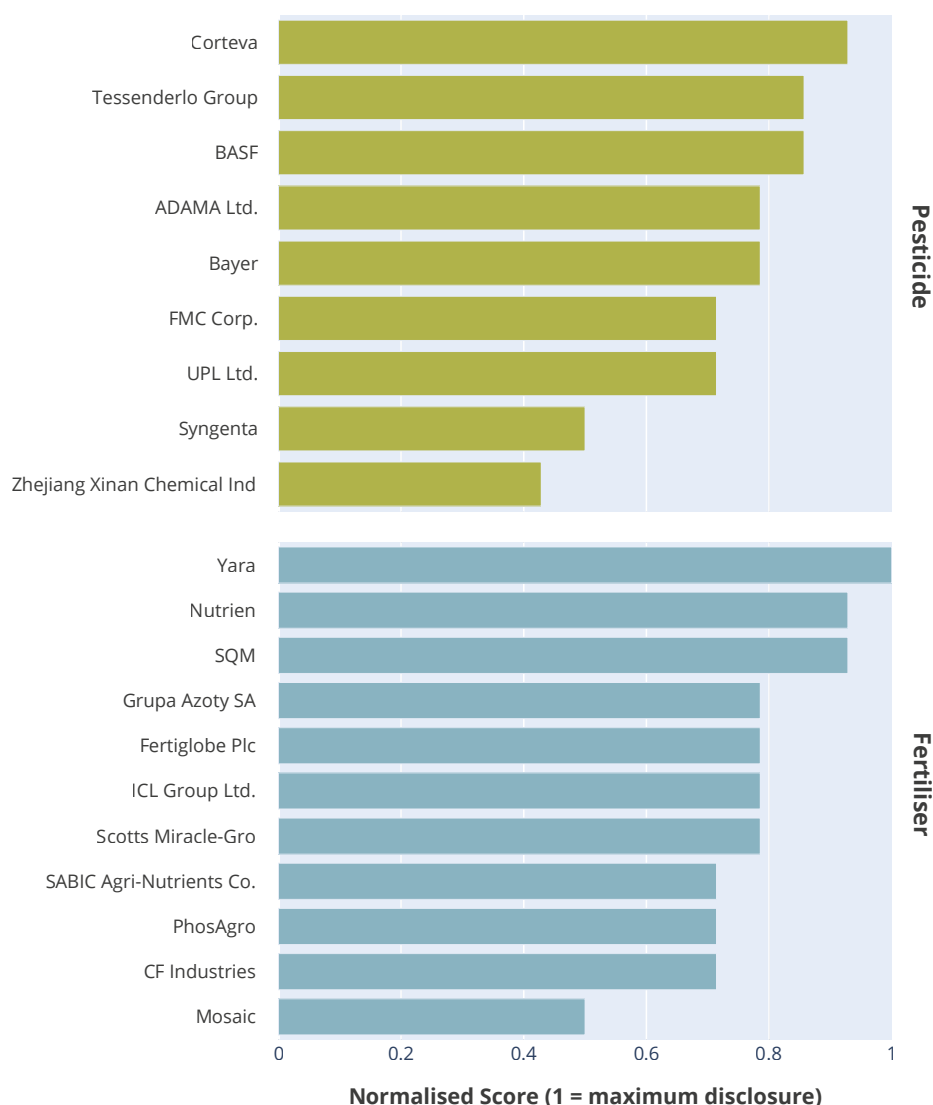


Figure 2: We saw significant variability in the level of disclosure across the group. Source: Planet Tracker.

This variance in rate of disclosure was also seen over time. For instance, comparing CF Industries to Tessenderlo Group (Figure 3) we see Tessenderlo showing a relatively steady increase across the period from 0.61 to 0.76, whilst CF Industries' score was more volatile, falling from 1 to 0.7 over the period.

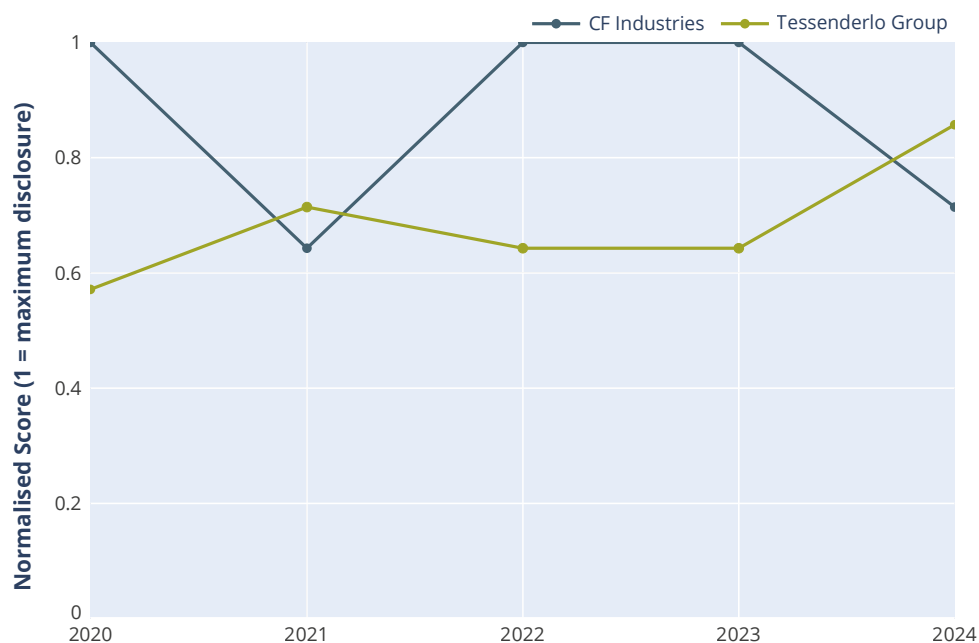


Figure 3: The overall trend for the group hides variation at the corporate level. Source: Planet Tracker.

Looking at the period from 2020-24, we see some companies significantly improving their disclosure rate. In Figure 4 we show the level of disclosure by company for 2020 and then the improvement or deterioration versus this level in 2024.

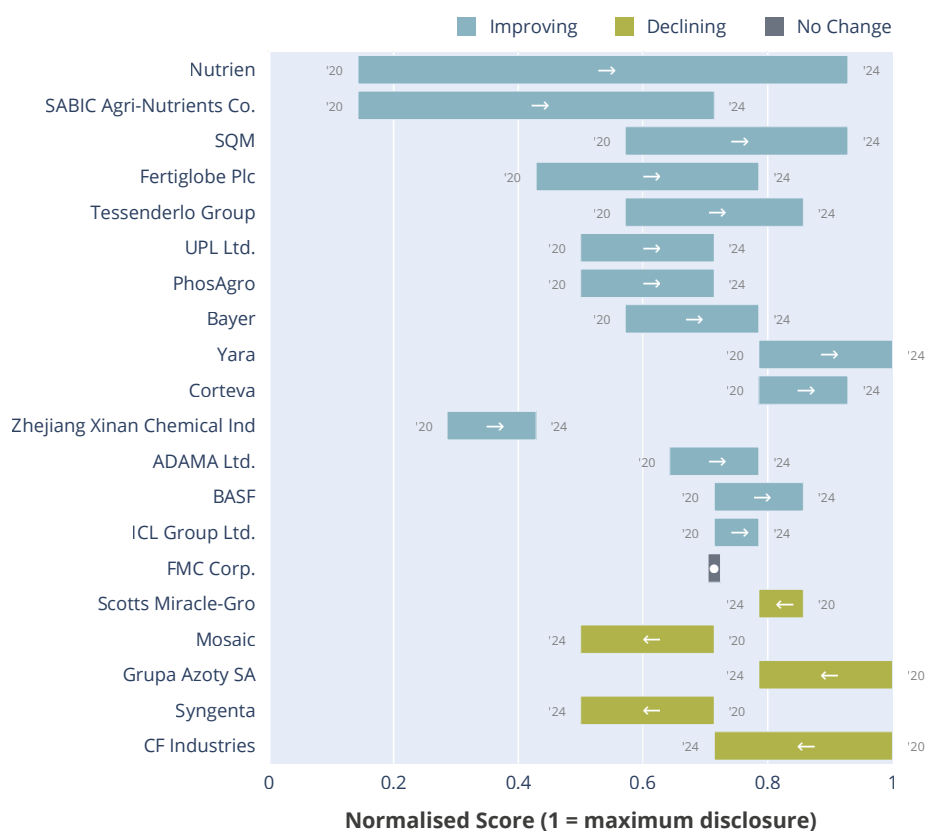


Figure 4: Most corporates have improved disclosure levels, though some have declined. Source: Planet Tracker.

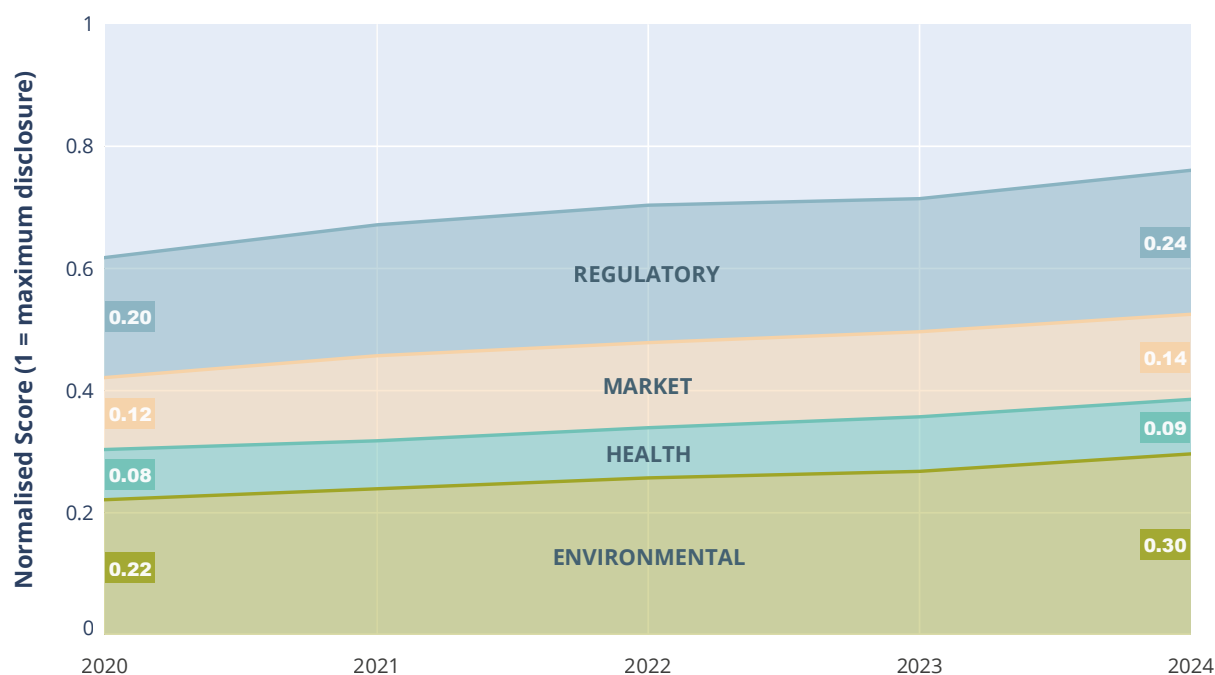


Figure 5: All of our risk types saw improving disclosure across the period. Source: Planet Tracker.

Five of the 18 risks were discussed by every company for which they were relevant – these were risks relating to pollution and contamination, workplace hazards, energy consumption, mining-site restoration and chemical disposal. On the other hand, five of the 18 risks were discussed by less than 50% of the companies for which they were relevant – including risks relating to market share gains from organic and alternative farming, soil fertility, eutrophication, crop resistance and pollination. These under-emphasised risks are financially material and merit increased disclosure to investors.

The most commonly discussed risks related to waterway pollution, workplace hazards, chemical waste management, high-energy processes restoration of mining sites and restoration of contaminated manufacturing sites – see Table 3.

Table 3: Some risks were discussed by all corporates, whilst others were barely mentioned. Source: Planet Tracker.

Rank	Risk question	Universe applied to	2024 score
1	Waterway pollution and contamination from leaching of applied products	Pesticide, fertiliser	1.00
2	Workplace hazards	Pesticide	1.00
3	High energy input costs	Fertiliser	1.00
4	Restoration of mining sites	Fertiliser	1.00
5	Disposal of chemical waste, such as gypstacks	Fertiliser	1.00
6	Restoration of contaminated manufacturing sites	Pesticide, fertiliser	1.00
7	Carbon costs	Pesticide, fertiliser	0.95
8	Products being banned from being produced or sold	Pesticide, fertiliser	0.85
9	Negative public perception of chemical-intensive agriculture	Pesticide, fertiliser	0.80
10	Human health problems from products	Pesticide, fertiliser	0.80
11	Class action lawsuits and legal challenges from health/environmental claims	Pesticide, fertiliser	0.80
12	Rising compliance, testing, registration, or re-registration costs	Pesticide, fertiliser	0.70
13	Soil degradation	Fertiliser	0.64
14	Demand destruction by organic farming or alternatives	Pesticide, fertiliser	0.45
15	Soil fertility loss	Pesticide	0.44
16	Eutrophication from nutrient runoff	Pesticide, fertiliser	0.35
17	Pesticide resistance	Pesticide	0.33
18	Loss of pollinators and beneficial insects	Pesticide	0.33

However, some target risks were only mentioned by a minority of companies, with five of the 18 risk areas scoring less than 50%.

Not well disclosed, but potentially material

We found that five of our risk areas were discussed by less than half of the companies. These were potential demand destruction from organic farming or alternatives, eutrophication, reduction in soil fertility from pesticide use, pesticide resistance and potential loss of pollinators and beneficial insects.

We believe all these issues should be considered as potential risks to the corporates in our analysis. A move in consumer preferences for organic or less chemical-intensive farming could represent a material threat to the sales of both fertilisers and crop protection companies. Eutrophication raises the risk of increased regulation to protect water quality and local ecosystems. Reduced soil fertility could lead to reduced crop yields driving up food prices, perhaps leading to a move away from chemical intensive agriculture or more regulation. Pesticide resistance could be a threat to sales of key products if their efficacy is challenged. A loss of pollinators and beneficial insects could see reduced crop yields and a move towards more regulation, product bans and less intensive use of chemicals.

Nutrien refers to a shift in “social trends” as part of a high-level discussion of material risks:

“The agricultural landscape continues to evolve as a result of factors including, but not limited to, farm and industry consolidation, changing farmer demographics, technology developments, sustainability practices, changing government programs and policies, climate change and shifting social trends, many of which vary from jurisdiction to jurisdiction. These factors as well as other factors affecting long-term demand for our products and services could adversely impact our strategy and our financial results.” – Nutrien Annual Report 2024, page 45.

CF Industries discusses how they are working with their customers to try and reduce eutrophication risk:

“Extending CF Industries’ water stewardship beyond the fence line, environmental stewardship of our products is a material issue that is addressed under our Food Security and Product Stewardship dimension. We actively promote the 4R Plus Nutrient Stewardship program that utilizes science-based best management practices for fertilizer application to achieve specific cropping system goals, while improving agricultural efficiency and reducing any impact on surrounding water systems.” – CF Industries Corporate Stewardship Report 2024, page 85.

UPL refers to growing pest resistance as a “Critical” risk in their disclosures:

“Pest Resistance: There is an increasing risk of resistance development among pests, weeds, and insects due to natural evolution and prolonged use of crop protection products, reducing the effectiveness of established formulations and impact crop yields and product performance. Mitigation measures: Develop innovative products and improved formulations while engaging closely with farmers and customers to address evolving trends and pest resistance. Risk intensity: Critical.” – UPL Annual Report 2024, page 49.

FMC was one of the few companies to mention the topic of biodiversity impacts directly, and did so only to deny it was a financially material risk:

“At FMC, we develop solutions that help farmers improve productivity while promoting resource efficiency and sustainable use of inputs. One way we do this is by understanding how synthetics, biologicals, and precision agriculture technologies can work together to provide excellent plant protection from biotic and abiotic stresses, while helping farmers reduce water use, enhance soil quality, and minimize impact to beneficial insects like pollinators.” – FMC 2024 Sustainability report, Page 20.

What do companies actually say?

In the second part of our analysis, we looked more closely at the comments that companies made on our target risks. This included considering what good disclosure looks like in these areas. In this analysis, we looked only at commentary from the latest reported fiscal year.

It isn't a risk, it's an opportunity!

In a number of cases, we found that where a company did discuss an issue we targeted with our questions, they framed it as an opportunity for their business, rather than as a risk.

One example of this was the surprising finding that crop protection companies made little mention of the risk of growing resistance to their products.

For instance, from ADAMA:

"These innovative products are designed to provide farmers with better solutions to the challenges they face, including weeds, insects and disease, increasing resistance and insufficient pest control related to the use of genetically modified seeds." – ADAMA Annual Report 2024, Page 38.

We speculate that crop protection companies in general may be motivated to divert attention away from their responsibility for the cause by focusing on the opportunity for new products to address resistance.

As part of our analysis, we looked to identify cases where the company was discussing an issue as an opportunity. In Figure 6 we show the results of this analysis for each of our high-level categories of risk types. For both environmental and market risks, we found several examples where the issue was being framed as an opportunity. This was less common for either the regulatory or health categories.

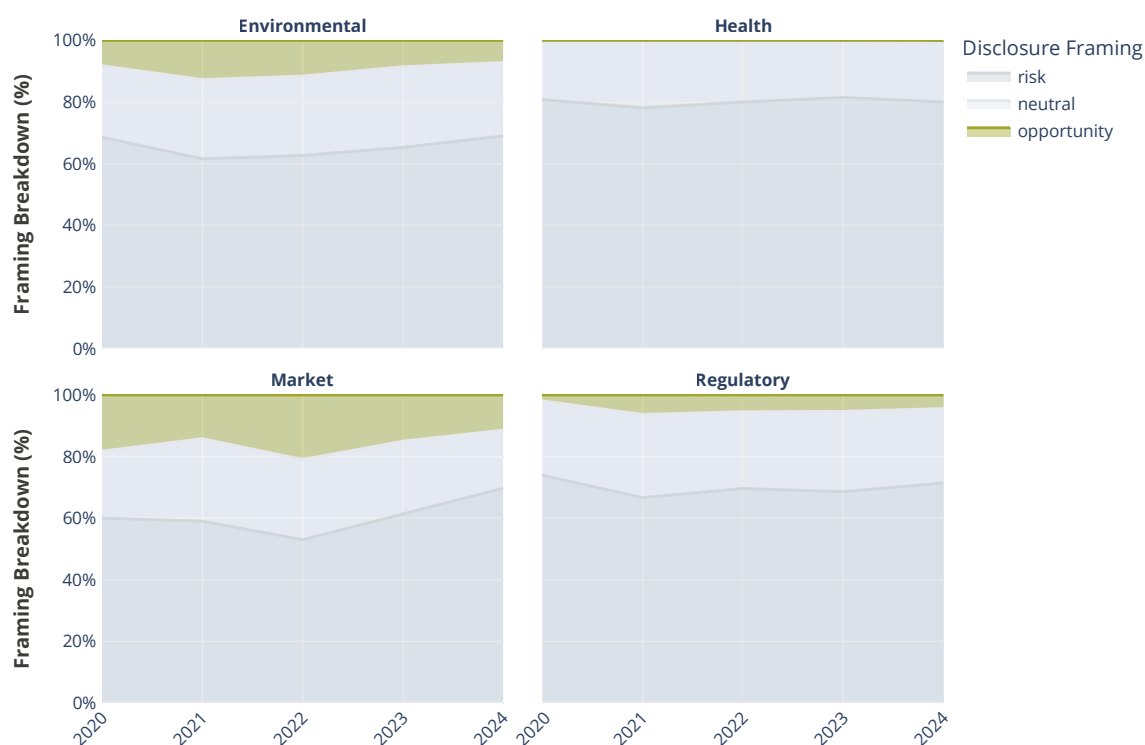


Figure 6: In some cases, topics were framed as an opportunity for the corporate. Source: Planet Tracker.

Litigation loosens tongues

For a number of the risk areas we analysed, a driver for corporates to discuss the topic appears to be when they face, or could face, litigation. We found that litigation issues included alleged human health and environmental impact related litigation.

Litigation commentary was usually not a strategic discussion of the potential risk, but rather reporting on current cases and potential future payouts. We did categorise this as an acknowledgement of the risk.

For example, Bayer comments that:

"Glyphosate is the active ingredient contained in a number of Monsanto's herbicides... As of December 31, 2024, Bayer's provision for the glyphosate litigation totalled US\$5.9 billion (€5.7 billion)." – Bayer Annual Report 2024, Page 93.

As a further example, Syngenta reports that:

"In October 2014, a Motion for Authorization was filed by the same firm of plaintiffs' counsel in Montréal, Quebec seeking permission to bring a similar class proceeding in that province. The proposed representative plaintiff operates a family business specialized in the breeding of queen bees. The Quebec litigation closely resembles the original Ontario lawsuit claiming negligence except that, rather than a nationwide class, it alleges a class limited to Quebec. At this early-stage damages are unspecified. The Motion for Authorization was argued in November 2017. The Quebec class has been authorized on August 20, 2018, and notices have been sent to potential class members. Plaintiffs' motion to add Syngenta AG as a defendant has been granted. Syngenta will defend these lawsuits, the claims in which are without foundation." – Syngenta Financial Report, page 88.

Litigation driving greater discussion of our target risks is unsurprising, as companies are required to disclose ongoing litigation in their reporting along with any financial provision they are making for future pay-outs. However, it is not just current litigation that presents a material risk for investors – potential future litigation, both on harms that are already in the focus for the legal system and regulators, and material harms that may reasonably be expected to be a focus in the future. Given this, companies should address all their material harms and impacts in their disclose of risk analyses. Investors should interrogate companies on their tolerance for litigation risk into the future and their strategies to mitigate such risk, given the potential impact of litigation on both revenues (through reputational damage) and costs (legal fees and settlement payouts).

In the plastics space, Planet Tracker's recent *Toxic Additives* report highlighted that the lack of data on the toxicity of products leaves investors in the dark on potential future litigation risk. Investors in the crop protection industry should also consider how much they know about the toxicity of investee company products and how that affects future litigation exposure.

Regulation seems to work

Positively, our analysis suggested that regulation is also a driver of increasing discussion in certain areas.

For instance, the imposition of carbon taxes has elevated this as a risk issue in the disclosures of companies in the affected jurisdictions. **For example, Sociedad Química y Minera de Chile (SQM) states:**

“Climate change transition risks mainly impact our Plant Nutrition area, especially in the fertilizer market. Regulatory changes coming from the European Union, as well as the payment of carbon taxes in Chile, have a direct impact on these products. The Carbon Border Adjustment Mechanism (CBAM) requires us to declare the carbon footprint of our fertilizer products for tax purposes in the European Union in the coming years.” – SQM Sustainability Report 2024, page 185.

CF Industries refers to potential future regulation of their products as a risk.

“In addition, from time to time various foreign governments and U.S. state legislatures have considered limitations on the use and application of nitrogen fertilizers due to concerns about the negative impact that the application of these products can have on the environment... Any reduction in the demand for our nitrogen fertilizer products, including as a result of technological developments or limitations on the use and application of nitrogen fertilizers, could have a material adverse effect on our business, financial condition, results of operations and cash flows.” - CF Industries 2024 Annual Report, page 14.

The responses we saw to new or proposed legislation suggests that regulators should continue to target salient sustainability issues in the expectation that it will drive corporates towards greater disclosure on these areas.

Externalities remain under-discussed

Our analysis suggests that it is most common to see companies discussing those risks where the financial materiality is current or already realised. For instance, litigation discussion was often associated with amounts set aside as provisions for payouts. Similarly, costs spent on or set aside for remediating manufacturing sites were often spelled out.

These risk discussions and the associated financial detail represent corporates acknowledging a crystallised issue and internalising the associated costs.

In contrast, costs which are currently externalities^b, i.e. not borne by the company itself, were rarely discussed in detail or referenced as significant risks to the business. For instance, pesticides are likely contributing to the collapse in pollinator numbers seen in many countries, which could have devastating effects over the medium-term. However, as this future cost is not currently expected to be directly borne by pesticide companies, it is rare to see it acknowledged as a risk or issue in their disclosures.

^b *An externality is a positive or negative effect for someone else as a result of something that you do*

We acknowledge that understanding and modelling some of these externalities may be difficult for many corporates, which may discourage their inclusion in risk disclosure. However, even if hard to quantify, companies should identify these risks, which may become internal costs for the company in the future. It is noteworthy that pollution of waterways from applied products was discussed by all the corporates. This is a risk that would have been considered an externality a few years ago with little direct impact on the polluting corporates. However, this issue is rising on the regulatory agenda, resulting in potential costs in the near-term for polluting companies.

For instance, Mosaic comments:

“New nutrient regulatory initiatives could have a material effect on either us or our customers... While some of the legislative actions have changed application timing of nutrient use, we cannot overall predict what the requirements of any such legislative or regulatory action could be or whether or how it would affect us or our customers.” – Mosaic Annual Report, page 26.

Similarly, Yara says:

“Regulatory framework for production, handling and application of products: There is an increasing trend of stricter governmental regulations affecting the entire value chain, including the production, distribution, storage, and application of fertilizer. These regulations address both environmental (non-GHG) aspects and the safety of handling and applying fertilizer. Such regulations could impact Yara’s earnings and its license to operate.” – Yara Integrated Report, page 24.

This example reminds corporates, and their investors, that what is an externality today could become an internal cost tomorrow. As such, they should disclose the risk and develop strategies to mitigate them, reducing the potential future internal cost or liability.

Examples of better disclosure

While our analysis found that disclosure on our risk areas overall is solid, there are still gaps and room for improvement, particularly considering that companies often talk about the opportunity rather than the risk of some material factors. Below we show some examples of what we believe to be better practice in terms of the way corporates discuss the risks we analysed. These can serve as examples for investors to use in interactions with other corporates to encourage similar levels of transparency. Once those risks are disclosed, investors are then in a better position to engage the company on developing strategies to mitigate them.

BASF provides good clarity on how it addresses products in its portfolio that “do not pass sustainability requirements”. These “Challenged” products are targeted for R&D spend on replacement or reformulation, with a goal to phase them out over the medium-term.

“In the case of Challenged products, we develop action plans. These include research projects and reformulations to optimize products or replace them with alternatives. We are generally phasing out all Challenged products within five years of their initial classification...” – BASF ESG Report 2024, page 162.

BASF also provides useful detail for investors on the proportion of its sales which are “substances of very high concern (SVHC)” and their targets for this category. Given that SVHC are probably more likely to be a source of future litigation risk, clarity on their importance today and a target for their future reduction should be a focus for investors.

“substances of very high concern (SVHC) when used in the end consumer market, in violation of the BASF Code of Conduct or posing a global reputational risk. Percentage share in sales revenue: 1.3%” - BASF ESG Report 2024, page 161.

Corteva provides a thoughtful assessment of some of the risks it could face to its current business from growing public concerns around crop protection products.

“The degree of public understanding and acceptance or perceived public acceptance of Corteva’s biotechnology and other agricultural products and technologies can affect Corteva’s sales and results of operations by affecting planting approvals, regulatory requirements and customer purchase decisions. Concerns and claims regarding the safe use of seeds with biotechnology traits and crop protection products in general, and their potential impact on health and the environment reflect a growing trend in societal demands for increasing levels of product safety and environmental protection... As a result, such concerns could have a material adverse effect on Corteva’s business, results of operations, financial condition and cash flows.” – Corteva Annual Report, page 13.

Having noted that litigation often drives risk disclosure, we were pleased to see **ADAMA** including a broader note on future litigation risk in their disclosures.

“Product and producer liability are a risk for the Group. Regardless of their prospects or actual results, product liability lawsuits might involve considerable costs as well as tarnish the Group’s reputation, thus potentially impacting its profits. The Group has a third-party and defective product liability insurance cover. However, there is no certainty that the scope of insurance cover is sufficient. Any future product liability lawsuit or series of lawsuits could materially affect the Group’s operations and results, should the Group lose the lawsuit or should its insurance cover not suffice or apply in a particular instance.” – ADAMA Annual Report, page 44.

Conclusions

Addressing current and emerging sustainability-related risks and impacts, and developing strategies to mitigate them, should be a key focus for corporate management teams. Investors who finance or own corporates should also want to fully understand the risks a business faces so they can estimate their own exposures. Companies should recognise that material environmental impacts or harms (externalities) may become future internal costs due to changing regulation, reputational impact, customer preferences or competition. Such impacts are thus encompassed in the scope of relevance to investors. Our analysis found significant variation in the level of discussion of our target risks. For some subjects such as the risk of waterway pollution, there was good coverage, with most corporates discussing the risk. However, for other risk issues, such as impacts on pollinators and beneficial insects, only a minority of companies disclosed risks.

Risks which have current financial relevance were, unsurprisingly, discussed more frequently than potential future risks. For example, the presence of litigation, new regulation or remediation costs can drive corporates to provide transparency on the related issues in their disclosures.

We call on investors to ensure that corporates in the fertiliser and crop protection markets, include salient sustainability risks and impacts in their internal risk management processes and disclose the results and their mitigation strategies in their reporting.



Appendix: Detailed methodology

Planet Tracker utilised two approaches to assess risk disclosures in this report. One uses a hybrid approach where a RAG system and an LLM are combined to identify risk statements over multiple years (2020-2024), and the second approach directly uses an LLM to identify risk disclosures in 2024. Both approaches are described in detail below.

Approach 1: Historical Trend Analysis

Planet Tracker uses an in-house retrieval-augmented generation (RAG) approach to identify risk disclosures from company documentation collated from sources such as FactSet. We analyse documents published between 2020 and 2025. These documents are then converted to Markdown text using Google Gemini 2.5 Flash^c, split up into smaller chunks according to their semantic similarity and fed into a vector database ready for analysis.

For each risk disclosure question we analyse, and for each year of analysis, we generate five search queries that are slight variations of the original question, aimed at identifying all possible risk disclosures in the documentation. We then use vector retrieval to get the most relevant risk disclosures, or chunks of information, across all queries. These chunks are then re-ranked to improve relevance and to discard irrelevant chunks. The primary goal of RAG is to build a context of information that is relevant to the question we are trying to answer without too much irrelevant information, in order to minimise the risk of LLM hallucination. The longer the context, the larger the risk of hallucinations^d.

With our refined selection of chunks for each risk question, we then feed this into OpenAI GPT-5-mini along with the original risk disclosure question to:

- d)** Extract several relevant risk disclosures within the context that helps with scoring disclosure quality.
- d)** Classify each risk disclosure into the following categories: (i) temporal outlook, (ii) risk or opportunity, and (iii) whether it is financial or non-financial in nature.
- d)** Assign an overall disclosure score to the company based on all risk disclosures each year.
- d)** Run a consistency check using another LLM to ensure the original LLM is using the same criteria for every year of analysis, and to correct results if necessary.

Note that this is carried out over multiple independent steps, which is done to minimise risk of context pollution and hallucinations.

We ran this pipeline for all companies and all years and reviewed the results. We refined our prompts over time to account for nuances in the disclosure.

^c Due to the complex nature of annual reports, we chose not to rely on non-visual models

^d <https://research.trychroma.com/context-rot>

Approach 2: In-depth comment analysis

For the pure LLM-based approach, we used Google’s Gemini 2.5 Flash model. We ran the same analysis twice, but with the second run using a stricter prompt with a more narrowly defined set of criteria. The results from both analyses were combined to produce a result set of human-verified risk disclosures. We set out the methodology for this analysis below.

Documents analysed

This report analyses reports published in 2024 from 20 agricultural companies, as listed in Table 1. Documents include annual reports, integrated reports, sustainability/ESG reports, and financial statements, comprising 43 documents totalling 7,386 pages.

Questions asked

We examined 18 specific risk areas including pesticide resistance, litigation, water contamination, soil health impacts, climate-related costs, and regulatory challenges. See Figure 7 for more details. Some questions were sector-specific, whereas others were tailored to each business sector – crop protection or fertiliser production.

Analysis workflow

The following multi-step workflow represents our comprehensive AI-powered extraction and verification process. See Figure 7 for a flowchart outlining the process.

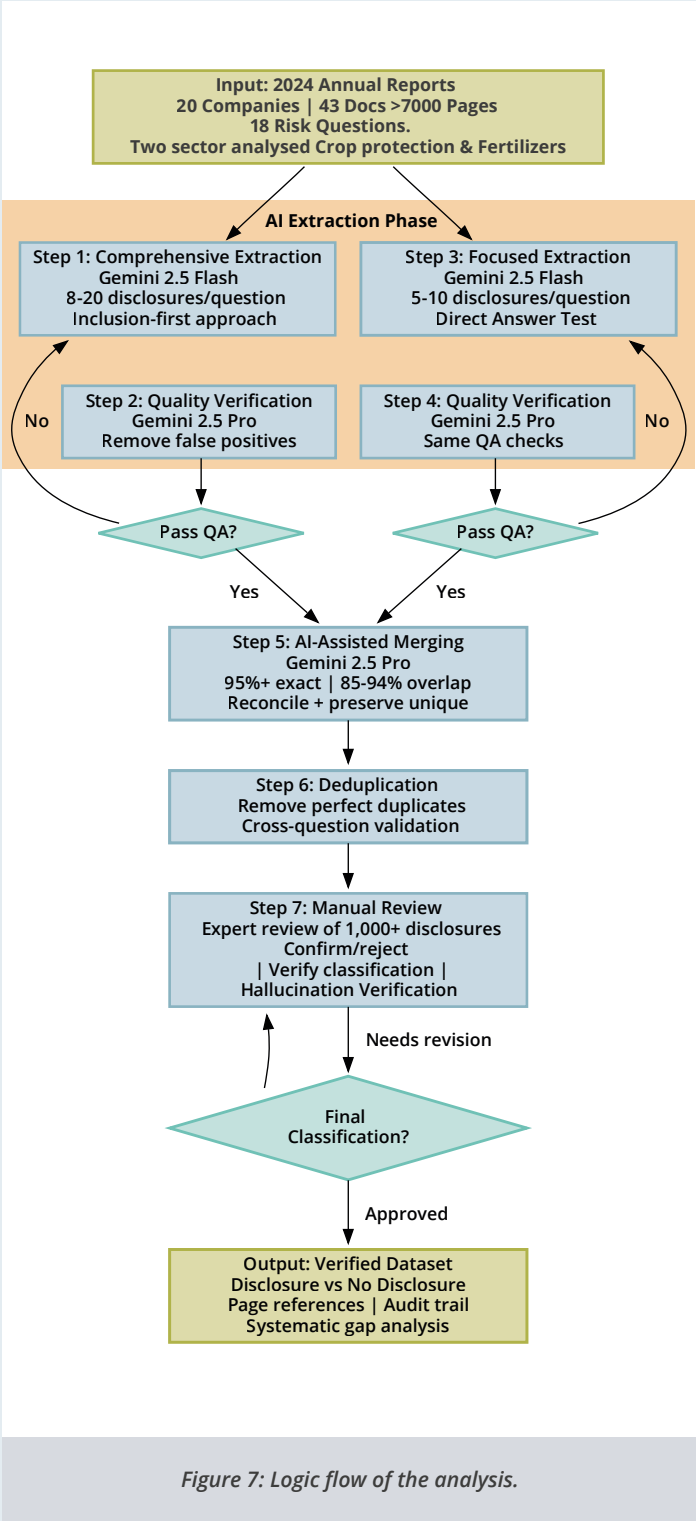


Figure 7: Logic flow of the analysis.

Step 1: Comprehensive extraction (analysis v1)

Using Google's Gemini 2.5 Flash AI model, we performed an initial comprehensive extraction designed to capture all potentially relevant disclosures. This version prioritises inclusion over exclusion, extracting 8-20 snippets per question when substantial content exists. The AI model was instructed to find evidence first, then classify, preventing bias toward any conclusion.

Step 2: Quality verification (results v1)

All extracted disclosures underwent independent verification using Gemini 2.5 Pro, a more advanced model, to check snippet relevance, classification accuracy, and identify common false positives such as table headers or generic statements. Most misclassifications were automatically corrected, and irrelevant snippets were removed.

Step 3: Focused extraction (analysis v2)

We performed a second analysis using a refined prompt that applies stricter quality filters. This version uses a "Direct Answer Test", i.e. snippets are only extracted if they directly and unambiguously answer the question when standing alone. This targets 5-10 high-quality snippets per question, reducing noise while maintaining comprehensive coverage.

Step 4: Quality verification (results v2)

The second set of results also underwent independent verification using Gemini 2.5 Pro, applying the same quality assurance checks to ensure accuracy and relevance.

Step 5: AI-assisted results merging

We merged the two verified result sets to create a "best-of-both-worlds" dataset. An AI workflow compared snippets using text similarity analysis:

- Exact duplicates (95%+ similarity): AI selected the better version.
- Overlapping snippets (85-94% similarity): AI reconciled differences and merged content.
- Unique snippets: Both versions were preserved when they captured distinct evidence.

The AI model merging the datasets applied strict classification criteria and flagged instances of product benefit framing, when companies state things like "our products reduce environmental impact", which helped ensure that only genuine risk disclosures were included in the analysis.

Step 6: Deduplication

A final deduplication pass removed any perfect duplicates that emerged during the merger, normalising text and collapsing identical content into single disclosures. We also performed cross-question review to identify snippets appearing under multiple unrelated questions, using AI to validate whether each instance was legitimately relevant.

Step 7: Manual review and classification

Following the automated analysis and quality assurance steps, the report authors manually reviewed over 1,000 extracted snippets. Each snippet was independently assessed to:

- Confirm or reject the AI's extraction decision.
- Verify or reclassify the disclosure type.
- Ensure consistency in classification standards across companies.
- Eliminate persistent duplication.
- Identify hallucinations and paraphrased text to enhance disclosure quality.

This manual review serves as the final quality control layer, correcting any remaining AI errors and applying expert judgement to ambiguous cases.

Classification standards

We applied a two-category classification system to each of the risk disclosures:

- **DISCLOSURE:** The company provides substantive information about the financial implications of the risk to the business, which can be fully quantified with materiality statements, partially quantified, or qualitatively discussed as a financial concern.
- **NO DISCLOSURE:** Either no relevant information was found, or the topic was mentioned without characterising it as a risk to the business. For instance, descriptions of general sustainability initiatives, product benefits, or compliance programmes that are mentioned without referencing business risk were classified in this category.

Quality assurance

Our multi-stage verification process was specifically designed to catch common AI extraction errors:

- **Table headers:** AI models sometimes extract column headers or section titles without substantive content. Verification steps identify and remove these false positives.
- **Generic statements:** Broad sustainability claims that do not address specific risks are filtered out during verification.
- **Product benefit framing:** Statements about how products reduce environmental impacts (marketing content) are distinguished from actual risk disclosures.
- **Classification accuracy:** Verification ensures that financial amounts without materiality statements are not incorrectly classified, and that the final classification reflects the actual disclosure quality.

The combination of automated verification, using a more advanced AI model, and manual expert review ensures high accuracy in the final dataset.

Transparency & auditability

Every finding in this report includes the source page number from the PDF, allowing readers to verify the original text in company filings. Classification decisions follow explicit criteria applied consistently across all companies through both automated and manual review processes.

Limitations

PDF page numbering

Page numbers referenced in this report are extracted from PDF metadata and may not match the printed page numbers visible in the document. This occurs when PDFs include cover pages, disclaimers, or front matter before page 1, or when multiple documents are combined into a single PDF. In some cases, the extracted page number may be offset by several pages from the physical page number. Cross-referencing with section titles or nearby content may be necessary to locate specific disclosures.

AI model limitations

While our multi-stage verification process catches most errors, AI models occasionally:

- Extract table headers or section titles as standalone snippets.
- Misclassify the disclosure level.
- Include product benefit statements that should be excluded.

These limitations are mitigated through multiple verification passes using different AI models (Gemini 2.5 Flash for extraction, Gemini 2.5 Pro for verification), explicit quality control checks, and final manual review by report authors. However, readers should note that the initial automated extraction and intermediate classifications rely on AI interpretation guided by strict criteria.

Document processing constraints

Analysis is limited to text and tables that can be extracted from PDFs. Images, charts, and complex visualizations are not analysed. Very large documents (300+ pages) may be truncated to fit within AI model context limits (1 million tokens for Gemini 2.5 Flash).

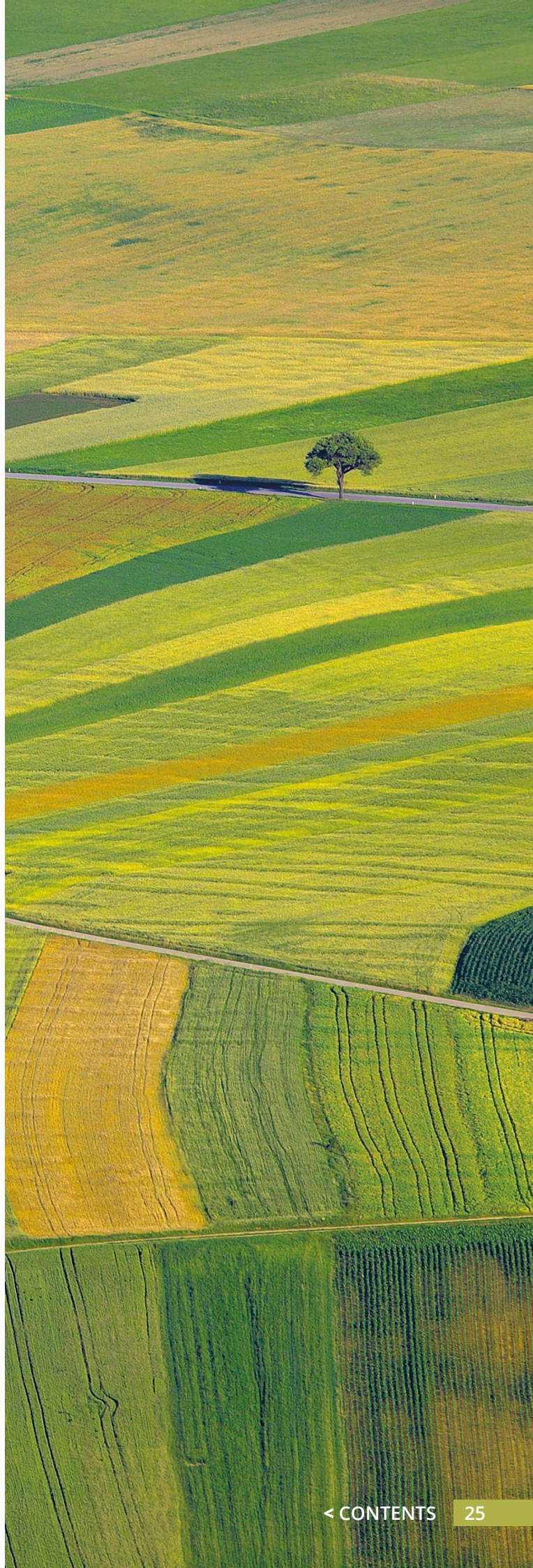
Output

The analysis produces a structured dataset of disclosure snippets, each tagged with its final classification (Disclosure or No Disclosure), source page location, and verification metadata documenting the review process. This enables systematic comparison of disclosure practices across companies and identification of specific gaps where financial risks are under-disclosed.

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ABOUT PLANET TRACKER

Planet Tracker is an award-winning non-profit financial think tank aligning capital markets with planetary boundaries. Created with the vision of a financial system that is fully aligned with a net-zero, resilient, nature positive and just economy well before 2050, Planet Tracker generates break-through analytics that reveal both the role of capital markets in the degradation of our ecosystem and show the opportunities of transitioning to a zero-carbon, nature positive economy.

FOOD AND LAND USE PROGRAMME

Programme goal: to align capital markets with a sustainable global food system. Before 2050, Planet Tracker's Food and Land Use Programme will highlight the investment risks and opportunities associated with the just and equitable transformation of the global food system that eliminates negative externalities with respect to climate, nature, and health so that it is fit to feed the world's growing population within planetary boundaries. By highlighting these risks and opportunities, Planet Tracker's Food and Land Use programme will influence financial market actors to actively support and fund this transformation.

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