The State of Corporate Disclosure on Well-being:

A Review of Corporate Reporting Practices in the Food and Agriculture Sector in 2018

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Abstract.

Our paper reviewed the current state of corporate disclosure on well being. To do so, we mapped the information and metrics disclosed by forty-eight agricultural companies by stakeholder impacted, Sustainable Development Goal fulfilled, and the seven categories of Stiglitz, Sen & Fitoussi's definition of "quality of life". The current reporting framework appears to lack rigor and to leave many well-being issues uncovered. We observe that companies disclose mostly "effort-driven narratives" and metrics, informing about actions and strategies. Little information is provided on corporate impact on stakeholders' well-being and no rigorous set of indicators emerges from the analysis.

We identify critical disclosure gaps for the well-being of all stakeholder groups. Local communities' disclosure, in particular, suffers from major limitations. First, the disclosure on corporate influence over national communities, through lobbying and tax payment (SDG16, Peace, Justice and Strong Institutions) is weak in coverage and in depth. Second, corporate measures of local communities' environmental protection (and therefore health) just emerged. Disclosure on employees' well-being, on the other hand, benefits from a more robust disclosure, as most of the information lay in the human resources department. Few best-practices are presented in this paper, along with discussions on emerging metrics. We argue that corporate reporting would benefit from a more rigorous reporting framework assessing the various dimensions of well-being.

I. Introduction

Our paper proposes a mapping exercise to assess the level of standardization of the data, gaps, and quality of information on well-being provided in the disclosures of leading companies from the food and agriculture sector.

A substantial body of work exists concerning the definition of well-being indicators from a national point of view in an attempt to complement the use of gross domestic product. The report, led by Stiglitz, Sen, and Fitoussi (2009), identified seven dimensions to the 'quality of life': material living standards (income, consumption, and wealth); health; education; personal activities, including work, political voice and governance; social connections and relationships; environment (present and future conditions); and insecurity (of an economic, as well as physical, nature). The Organisation for Economic Co-operation and Development (OECD) complemented this work with the development of a comprehensive framework that separates quality of life, material conditions, and resources for future well-being. The OECD now publishes an annual evaluation of well-being in OECD countries (OECD, 2017).

In parallel, companies have developed sustainability disclosure practices. The Global Reporting Initiative (GRI) provides a critical framework for companies to identify which metrics and topics they should report upon. The GRI combines a general set of metrics to be applied to all sectors (GRI 102, 2016) and thematic reporting frameworks. According to a report written by the World Business Council on Sustainable Development (WBCSD), Yale Initiative on Sustainable Finance and the GRI (WBCSD, 2018), about 46% of the food and agriculture companies reviewed mentioned using the GRI framework for key guidance in their reporting. The GRI, however, has been criticized for its lack of required verification, and the overly large scope of indicators that leaves space for cherry-picking (Esty & Winston, 2009; Roca & Searcy, 2012; Moneva, 2006). The Global Impact Investing Network (GIIN), with its database, IRIS, is another key

provider of impact metrics for businesses[1]. More recently, the Sustainable Accounting Standards Board (SASB) has provided reporting standards per sector, with a focus on material issues for investors[2].

Because of the multiplicity of reporting standards, there has been an attempt to identify the most common indicators in corporate reporting in general (Fifka, 2013; Habek & Wolniak, 2015), and in more specific areas of corporate reporting, such as – to name but a few – supply chains (Ahi & Searcy, 2013), corruption (Barkmeyer, 2015), poverty (GRI, 2018), and occupational health and safety (OHS) (Koskela, 2014). We have not found any research explicitly analyzing corporate sustainability disclosures from the overarching perspective of stakeholder well-being, however. The emergence of the Sustainable Development Goal (SDG) framework for corporate reporting may contribute to the development of an indirect focus on well-being in company disclosure filings. In its annual report on the state of corporate reporting, KPMG (2017) observed that SDGs emerge as a clear trend in corporate reporting, with more than 39% of companies organizing their reporting around these goals.

To get an initial overview of the practice today, we decided to go back to the fundamentals of the information provided by companies in their sustainability filings. Consequently, this article provides a review of the state of play of corporate sustainability disclosures on well-being in the food and agriculture sector. Because food and agriculture affect all parts of society, from consumers to suppliers and communities, this sector provides a strong representation of the challenges faced by companies in reporting well-being impact indicators. We listed, scored, and analyzed the information reported by: a) 48 companies in the food and agriculture sector; and b) three Environmental, Social and Governance (ESG) data- and index-providers. All of the information disclosed was classified according to the SDG framework, and according to the stakeholders impacted (consumers, employees, local communities, global communities, suppliers, shareholders). The results were analyzed against the seven dimensions of the quality of life of Stiglitz et al. (2009).

[1] GIIN. Getting started with IRIS. Available online at: https://iris.thegiin.org/guide/getting-started-guide/summary
[2] SASB. *Implementation guide for companies.* Available online at: https://library.sasb.org/

The question of the quality and materiality of the information disclosed was critical to our gap analysis. We did not want to only focus on the most common metrics (GHG emissions, injury rates, etc.) to ensure that we did not miss a large portion of corporate reporting. Best practices recommended by disclosure standards include the development of metrics (SASB and GRI) and measurable targets (The Sustainable Stock Exchange Model guidance on reporting information to investors[3]). To be useful to stakeholders, we have considered that the information should to be comparable, reliable (Esty & Cort, 2017) and, most importantly, 'material' (WBCSD, 2018). We built our scoring methodology to reflect these latest trends.

Our analysis revealed some stunning results, which may, unfortunately, not be surprising. In line with the literature mentioned, only five issues seem to benefit from consensual metrics: GHG emissions, water consumption, waste production, social audits and monitoring and gender equality. For the rest, even if companies generally cover a similar set of issues, their practices vary too widely to allow the identification of common metrics. In particular, company sustainability filings still mention an impressive number of policies, but with no mention of quantitative metrics or targets.

A better harmonization of the metrics is not out of reach, however; a few indicators that are informative about employee well-being, in particular, are within reach.

The current reporting framework lacks rigor and leaves many well-being issues uncovered. We identified some boggling gaps. In particular, disclosure on business impacts on the local community (national or local) is scattered and weak. We observed a striking lack of disclosure of companies in addressing impact on national communities via impact on governments. Two companies out of forty-eight provided an indirect reference to total lobbying spending (in the USA, as required by US law). Only one company out of forty-eight pledged to pay taxes where it operates. Herein, we argue that tax payment, lobbying practices and the fight against corruption are critical elements of a conversation on stakeholder well-being, as reflected in

[3] Sustainable Stock Exchanges Initiative Model Guidance on Reporting ESG Information to Investors. Available online at: http://www.sseinitiative.org/wp-content/uploads/2017/06/SSE-Model-Guidance-on-Reporting-ESG.pdf

SGD 16, Peace, Justice, and Strong Institutions. These aspects tend to be overlooked in the traditional ESG analysis where G only stands for the internal governance of companies.

We also observed that metrics on local community environmental protection and health were weak, in coverage and depth. Companies disclose output metrics (e.g., chemical input, wastewater treatment, water consumption) or philanthropic actions to communicate about their efforts towards local communities. But only few impact metrics allow to measure the *impact* experienced by the communities. As a result, researchers are currently working to develop new local or "context-based impact metrics" (e.g., biodiversity loss, nitrogen pollution, biophysical accounting). (see section 2.c). In the future, these metrics may provide a more accurate vision of companies' impact on the ground.

As for consumers, agriculture companies largely focus on consumers' health. If companies tackle quite systematically the need for healthy nutritional inputs in their products, they often overlook other health concerns such as product toxicity. We advocate for the development of a more rigorous approach to analyzing companies' impact on consumer health.

To conclude, .many of the metrics provided by the companies, which follow the GRI and GIIN frameworks, are actually *effort-driven*: 'We reduced our GHG emissions', 'We perform social and environmental auditing', 'We reduce the amounts of chemicals we use', for example. A perfect set of metrics for business *impacts* on well-being may still need to be developed, or to be used. Metrics providing scientific proof of a business's impact on health, wealth, and security, through independent datasets, offered by satellites, sensors, economic data, justice data, social media, or polls, will be an interesting avenue to explore. We hope that the OECD initiative on measurements for business impacts on well-being can contribute to this positive development.

II. Methodology

In this paper, we have *not* developed a set of common indicators for well-being, but we *have* proposed a mapping of what and how companies disclose via the prism of stakeholder well-being. We analyzed the coverage and depth of the data, identifying what we consider to be gaps, based on cross-referencing between the SDGs and the well-being indicators defined in the Stiglitz et al. (2009) report. Ultimately, we provide a snapshot of the correlation between the indicators disclosed in company reports and by major data-providers.

Company database

To understand the landscape of well-being indicators disclosed by companies, we created a database of all items disclosed by companies in their sustainability programs.

We selected 90 companies from various food and agriculture sectors. The ninety companies are leaders in their sector and were crossed checked with companies of interest to the Moore Foundation, GRI, and WBCSD members. Out of these 90 companies, we were left with 48 companies that published sustainability information (which not all did) in a language that the researchers could easily read, i.e., in English or Spanish, and we received the support of a Chinese-speaking researcher for two companies from this sample. The 48 companies selected for the review are listed in Annex 1, and broad details are provided in Table 01.

Table 01: Sample of companies reviewed by region and sub-industry

Continent	Total Companies	Average Score
Asia	12	1.7
Europe	16	2.1
North America	15	1.9
South America	5	1.5

Sub-Industry	Total Companies	Average Score
Agro-chemical	4	1.5
Animal Nutrition	1	2.8
Beer & Wine	4	1.9
CPG	10	2.3
Dairy	1	1.5
Food additives	1	1.3
General trading	2	1.6
Grain	9	1.6
Meat	4	1.8
Restaurant	2	1.7
Retail	9	1.8
Seafood	1	2.9

A team of five researchers reviewed the 48 reports and websites, listing all information disclosed in the sustainability reports in one database. We considered, then rejected, the possibility of selecting some information as relevant to well-being, and leaving some aside, but this process was too complex and subjective. Eventually, all information disclosed by the companies, directly or indirectly, related to the well-being of stakeholders. For example, the fight for climate change, or efforts towards a circular economy, translate into attempts to mitigate threats to future global communities, regarding their environmental protection, health, and security (dimensions presented in Stiglitz et al., 2009).

Each piece of information disclosed in a sustainability report was designated as an item. Each item got a score based on the depth of the reported information. We, therefore, defined a rating system that could capture the variable quality of the information reported, such as communication statements, philanthropic efforts, policies, quantitative metrics, collaborations, narratives, or core business strategies. The rating system is defined in Table 02.

Table 02: Description of the scoring system

Score	Definition(s)
0	Mention of the issue with communication language.
1	The company mentions the existence of a policy or of internal efforts without quantitative metrics. The company mentions a collaboration with external organization (mainly NGOs) with no explanation of their objective.
2	Backward looking quantitative metrics.
3	Quantitative metrics with forward-looking target and progress. Audited/certified backward looking metrics. Collaboration with external organization which explains the objective and assesses the results.
4	Backward quantitative metrics + forward looking target + strategies on how the business is going to adapt its *core strategy* to tackle the issue.

Our research team faced a challenge concerning score category 2; should all quantitative metrics be rated the same, regardless of their materiality? In other words, should we give a metric that is mostly irrelevant to an issue (number of electric cars in an agriculture company) a score of 2, as well as one that is material and substantially informative (GHG emissions)? We decided that it was too subjective to gauge the materiality of quantitative metrics, and we did not find a good protocol to do so. Therefore, we gave a score of 2 to all metrics that stood alone, with no target or clear strategy. We observed, however, that the process of auditing, target-setting (score of 3), and strategic adaptation (score of 4) tended to outweigh immaterial quantitative metrics. The reader can, therefore, be confident that items scored 3 and 4 are mostly material to the company.

To illustrate this rating, below is a typical example of the various reporting depths on gender equality:

0. Boilerplate: “We ensure that women work in an environment free of discrimination”.
1. Policy without metrics: “Our internal equal rights policy provides strict guidelines to avoid unequal treatment between genders.”
2. Statistics on the gender breakdown by management levels, illustrating the glass ceiling and the pay gap.

3. Statistics on the gender breakdown by management levels, illustrating the glass ceiling and the pay gap, independently audited, or with a target for the future.
4. Statistics and strategic adaptation: “We have acknowledged that women in our company face pay discrepancies and we are tackling this challenge in several ways: we are running a survey among women staff to identify what may be considered key limiting factors to the promotion of women at executive levels; we plan to run ‘unconscious bias training’ programs for (x percent) of the top executives by (date); we started a women's leadership forum; we adapted our benefits to provide paternity leave as long as maternity leave; and we implemented a parity policy for top management positions. We will evaluate the results of these efforts by (date), and aim at a full gender equal company by (date)”.

Each item was connected to one SDG and one sub-topic. In the case of food and agriculture companies, we could place many of the topics under SDG#2, ‘zero hunger and sustainable agriculture’. But we realized that this would hide the different focuses on health, income, sourcing, etc. We, therefore, broke down SDG#2 into different SDGs. In SDG#2, we only included items directly related to the purpose of ending hunger.

The list of sub-topics (from here on called topics) was created in an incremental manner to ensure that no issue would be forgotten. To this end, the research team was asked to list all items identified in the report, and either allocate them to an existing topic from a list of issues used in the article by the WBCSD, Yale Initiative on Sustainable Finance and GRI (WBCSD, 2018), or to the category ‘other’. The list of ‘other’ topics was analyzed, and new topics were created. Items were then reviewed, one by one, to ensure streamlining across topics and stakeholders.

The various stakeholder groups identified were consumers, employees, the global community, the local community, shareholders, and suppliers. Items were generally applied to only one stakeholder group; for example, paid volunteering was allocated to ‘employees’, and not to ‘employees’ and ‘local communities’. Only a few items were duplicated through being allocated to two stakeholder groups; for example, ‘we

perform audits on our subsidiaries and suppliers', leads to duplicating the item and allocating it to both 'employees' and 'suppliers'. The stakeholder 'shareholder' was selected for items that related to corporate governance or reporting practices. 'Shareholders' was also selected when the target population was not clearly defined; for example, codes of conduct rarely mention whether they apply to employees or suppliers, or both.

Each of these assignments for the complete list of items was reviewed for consistency and accuracy by multiple researchers. Due to the large number of items present in each disclosure filing, we could not ensure that every single mention of an issue (score 0) was reflected in the database. For items scoring between 1 and 4, we are confident that most items have been incorporated.

The database resulting from this process contains 1,758 item lines.

Index and data-providers database

In order to understand what investors expect from companies when analyzing well-being indicators, we also created a database of the indicators of three of the most popular ESG metrics providers, Bloomberg, Thompson Reuters DataStream, as well as the Dow Jones Sustainability Index. Bloomberg and Thompson Reuters each provide their terminal-users with spreadsheets containing their metrics. Dow Jones provides two sample surveys publicly. For this study, the Diversified Consumer Services survey was used, as it was the broadest publicly-available survey.

For each provider, the items were assigned an SDG and topic, and an idea of whether the indicator was based on a policy or a quantitative metric.

III. Results

Section 1. Overall findings on the quality of reporting: material topics identified are similar, but the comparability of metrics is low.

With an average reporting score of 1.7 across all topics, the overarching results show that companies mention internal strategies that they do not back with quantitative metrics. Table 03 lists the five topics that meet our comparability conditions: 50% of companies reporting on the topic, and an average rating score above 2. Annex 1 lists all of the topics referenced, organized by their occurrence, and provides a snapshot of the level of comparability across topics.

Table 03: The four topics met our two criteria for data comparability

Topic	Reporting rate	Average Score	Most common metrics
GHG emissions	90%	2.2	Scope 1 and scope 2
Energy management	77%	2.1	Energy mix
Waste	57%	2.1	Waste reduction and/or waste to landfill
Social audits and monitoring	54%	2.1	Number of suppliers audited
Gender equality	50%	2.2	Workforce breakdown by gender

Section 2. Environmental protection, common metrics, and gaps

The disclosure of impacts on the environment is the most advanced of the three categories, with a broad coverage of 690 items for the 48 companies, and an average score of 1.9. We identified, however, that while companies are doing well while reporting on their efforts to reach a greater resource efficiency, they are not doing so well when assessing the local impacts of their practices. Table 04 offers an initial overview of the coverage and depth of reporting by SDG and stakeholder. The full mapping of SDG 6 (Clean Water and Sanitation) by topic is available as an illustration in Annex 2.

Table 04: Disclosure scores and coverage mapped by SDGs labeled in the Environmental ('E') category and by stakeholder group

Environmental SDGs	SDG 6	SDG 7	SDG 9	SDG 12	SDC 13	SDG 14	SDG 15	
SDG/ Stakeholder group	Clean Water and Sanitation	Affordable and Clean Energy	Industry Innovation and Infrastructure	Responsible Consumption and Production	Climate Action	Life Below Water	Life on Land	% of E Metrics
Consumers			0.75	1.00			1.25	1%
Employees	4.00	0.00		1.50	1.00			2%
Global Community	2.36	2.00	1.38	2.04	2.26	0.83	1.58	34%
Local Community	2.12		1.20	2.05		1.50	1.53	17%
Shareholders		2.14	1.00	1.42	1.86	1.00		19%
Suppliers	2.00		1.73	1.88		1.73	1.58	27%
All stakeholders	2.62	1.38	1.21	1.65	1.71	1.27	1.49	
Percentage of companies reporting	83%	77%	48%	100%	94%	19%	50%	

a. Environmental protection of global goods, towards target-setting

Common metrics to reduce resource use. Companies rigorously address the questions of climate change, water consumption, and waste reduction, with 83% of the companies reporting on their *GHG emissions*, 77% reporting on their *energy management*, 73% reporting on *water resource management*, and 48% on *waste management*. Up to 42% of the companies mentioned having a consistent *environmental management plan*. Most of these companies reported with auditable key performance indicators, with an average score

of above 2.0. Companies also reported on other resource efficiency issues in their production processes, such as *product packaging* (35% of companies, average score 2.0), and *transportation* (29% of companies, average score 1.9).

Sustainable sourcing, broad coverage, uneven disclosure. Sustainable sourcing indirectly relates to major questions on environmental protection (biodiversity, deforestation, climate) and security (labor rights). Companies largely address sustainable sourcing in their disclosures (80% of companies) with an average score of 1.9 (median score of 2). Most companies with a score of 2 mentioned the percentage of sustainable sourcing as a key metric, but generally for one or two commodities, mainly palm oil. Eight companies mention supply chain transparency and traceability as an objective, but the average score stalls at 1.5 as few of them provide metrics to back this effort. The best practices regarding supply chain transparency include the percentage of known suppliers and a downloadable list. Supplier audits are another best-practice, with full disclosure of the results and percentage of suppliers audited. In addition, companies have put in place grievance mechanisms, zero deforestation pledges, and collaboration with non-governmental organizations (NGOs). Generally, the information does not provide much knowledge about the real impact of sourcing, but displays efforts and attempts to mitigate negative impacts. Nine companies mentioned geospatial monitoring as a way of monitoring their supplier activities, with a very low average score of 1.2. This information may represent an interesting source for information in the future.

Company innovations towards sustainable agricultural practices. Half of the companies communicated about the implementation of some sort of innovative sustainable practice, be it farmer training, sustainability management, income generation schemes, or the uptake of innovative technologies to reduce the consumption of resources used. While this trend is encouraging, a narrative around the scope of these initiatives (e.g., percentage of farmers trained), and the scalability of the innovation (feasibility and timeline), is often missing (score of 1.4), leaving the reader with a sense of 'greenwashing'. The percentage of annual spending on research and innovation may offer a better proxy, although this information was not communicated.

b. Environmental pollution, the missing piece for local communities

As described in Stiglitz et al. (2009), environmental protection is one of the key components to quality of life, or well-being. A well-kept environment for local communities reduces health problems, and can create a feeling of happiness (Kellert, 1993). In this review of environmental disclosure practices, only a handful of items actually assessed the environmental *impact* that industrial and agricultural processes may have on local communities, including water pollution and scarcity, air pollution, chemical pollution, and biodiversity loss. Because resource availability is heterogeneous across regions, environmental impact is dependent on the location of resource use. More thoughts are provided in the discussion section about possible evolution.

Missing assessment of local chemical pollution in water, air and the land. As a starting point, companies addressed local pollution from a compliance point of view. Fifteen companies reported instances of environmental compliance breaches. Some of them described the nature of the breach and the associated penalties. Only a few companies, however, reported on local pollution mitigation strategies associated with their production and sourcing processes. Water treatment was the most advanced topic, with 16 companies disclosing information on their management of water quality (score of 1.9), although this topic is far less consensual than water resource management (consumption and reuse, 53 items, average score 2.2). Six companies mentioned their water discharge, and the quality of its treatment. Chemical input for agricultural processes (fertilizers, herbicides, pesticides) is also key for local environmental conditions, as it affects health, water quality, and the nitrogen cycle. Twelve companies mentioned chemicals or fertilizers as an issue in their report, with a median score of 1.0 (average of 1.7). Best practices on chemicals include a quantitative analysis of fertilizer inputs, and a target on fertilizers and nitrogen efficiency use. Only four companies addressed the question of air pollution, communicating information on SO_x and NO_x input, with an average score of 2.0.

A nascent practice for assessing local water scarcity risk. As mentioned in Section 2a, 22% of companies mentioned the risk of water scarcity at the local level (water basins), and addressed the need for local communities to access clean water. All of these companies used the World Resources Institute Aqueduct water risk map as a tool to assess production sites at risk of water scarcity. Only a few of them complemented this analysis with a convincing narrative on how they handled the possibility of a water shortage.

No clear metric for biodiversity loss. 41% of companies disclosed efforts to enhance biodiversity on land and in the sea, with an average score of 1.5 for terrestrial environments and 1.0 for aquatic life. These efforts were mostly focused on ways to enhance biodiversity, rather than on the mitigation of biodiversity threats. Half of the efforts of these companies addressed biodiversity on a global scale (e.g., weed resistance to herbicides, species protections, and pollinator conservation), and half were focused on local problems (e.g., mangrove protection areas, river conservation in Arkansas). Of the 29 items, eight were addressed in measurable terms (e.g., land conservation targets).

c. Discussion on environmental conditions reporting

Concluding our analysis on the measurement of business impact on environmental conditions, results show that companies are often able to measure their effort to curb the environmental externalities that threaten global communities (e.g., GHG emissions, global water consumption, resource depletion). On the other hand, they tend to fail to provide information on the impact of their processes and sourcing on local communities.

We identify the need for more rigorous reporting of local pollutant outputs, in particular chemical outputs but also better information on wastewater treatment and local and hazardous waste treatment.

We also argue that new metrics must be developed to provide a more a granular analysis of companies local impact on the environment, and therefore on local community. To date, very few metrics are designed to measure companies' local environmental impact, be it local pollution or resource extraction. As a matter of fact the local context is key to assess this impact. Agriculture impact on water pollution, water withdrawal, deforestation, nitrogen production and biodiversity loss is mostly dependent on the local ecosystems, resource availability and resilience (Dailin & Rodriguez-Iturbe, 2016). For example, due to varied water availability at the local scale, sourcing sugar cane in India may have more impact than sourcing sugarcane in Brazil. A new generation of metrics, called "environmental context-based metrics" is emerging as world datasets can now identify the areas that are most vulnerable to environmental impacts.

The WRI Aqueduct Water Risk Map has paved the way for this new approach on local environmental impact metrics. The tool is simple: providing a map which represents areas at risk of water scarcity. Companies can then overlay their production sites with this map and identify where their operations may *contribute* to local negative impact. The purpose here is not to exactly *quantify* nor *attribute* the impact of any one company on water scarcity By acknowledging where operations or sourcing may be a risk for the environment, the company is better equipped to cope with the environmental risk, mitigate it, and develop collaborative approaches in the area. More "context-based tools and metrics" could emerge from this 'contribution' approach as global datasets better inform companies and governments about national and local environmental conditions. Researchers in Harvard are currently trying to develop context-based metrics on the local quality of the water and air (Vörösmarty, 2018).

Sensors and satellites may soon provide more information on the local environmental conditions (Hansen et al., 2013). The organization Global Forest Watch[4] uses satellite imaging to compile a world map of forest loss, from which one can monitor local deforestation. As satellite imagery becomes more precise (the company Planet Lab is able to monitor forest loss in real time), and as supply chains become more

[4] Global Forest Watch, Annual loss of forested land. Accessible at: http://www.globalforestwatch.org/

transparent, we think that companies will be able to increase monitoring of their suppliers, and prove no contributions to deforestation via satellite data.

Biophysical accounting represents another promising area for the development of local impact metrics related to food production and local environmental protection. A growing literature is assessing resource use and pollution embedded in trade (MacDonald et al., 2015; Kastner et al., 2014). More precisely, researchers are modeling local impacts resulting from foreign consumption. For example, while palm oil is mostly produced in Malaysia and Indonesia, the major consumption of palm oil occurs in developed countries. As such, researchers can now model what is the Indonesian biodiversity loss triggered by the consumption of developed countries. Such models have been developed for water consumption (Dailin & Rodriguez-Iturbe, 2016), nitrogen input (Zhang et al., 2010; Zhang & Davidson, 2015; Oita et al. 2016) and biodiversity loss (Chaudhary & Kastner, 2016) induced by States imports. These biophysical accounting methods typically use a commodity specific coefficient (e.g., liters of water used per ton of wheat) and associate that with trade data. For example, Chaudhary & Kastner (2016, Chaudhary et al., 2015) developed a metric, *biodiversity loss per ton of crop in 184 countries*, to model the embodied biodiversity footprint of commodity importing States. The Yale Initiative on Sustainable Finance is currently looking into the possibility to use biophysical accounting methods to assess the local impact of commodities purchased by companies. In the near future, companies may be able to obtain a proxy for water scarcity, soil degradation or biodiversity loss associated with a ton of crop purchased and depending on its origin. All these metrics could hopefully strengthen the measure of business impact on local environmental, and indirectly their impact on local community health and well-being

Section 3. Better reporting on working conditions is within reach

Reporting on decent working conditions for suppliers and employees represented 222 disclosure items, with an average score of 1.6. Better reporting is within reach. Employee training, labor protections and human rights, equal opportunities and gender equality are the topics addressed by the largest number of companies. On the other hand, employee satisfaction and retention rates, which translate to a subjective feeling of well-being, are rarely communicated (less than 15 companies). Table 05 below provides an overview of the mapping by SDG and stakeholders on social issues. A more detailed table is provided in Annex 2 by Topic for the SDG "Decent Work and Reduced Inequalities".

Table 05: Disclosure scores and coverage mapped by SDGs labeled in the Social ('S') category and by stakeholder groups

Social SDGs	SDG 2	SDG 3	SDG 4	SDG 5	SDG 8	SDG 10	
SDG/ Stakeholder groups	Zero Hunger	Good Health and Well-being	Quality Education	Gender Equality	Decent Work and Economic Growth	Reduced Inequalities	% of S Metrics
Consumers	2.67	1.66					19%
Employees		1.74	1.75	2.08	1.75	1.73	49%
Global Community	1.71	1.83					6%
Local Community	1.07	1.43	1.29	3.00		1.00	11%
Shareholders		0.00				1.75	1%
Suppliers	1.00	2.07		3.33	1.34	2.00	17%
All stakeholders	1.61	1.46	1.52	2.80	1.54	1.62	
Percentage of companies reporting	31%	90%	17%	58%	92%	79%	

a. Missing pieces of income and economic security

Labor rights and physical security, an emphasis on audits for employees and suppliers. Labor rights are a critical issue in the food and agriculture sector, as instances of forced labor, child labor, and intensive labor have been reported in the production of many commodities, such as palm oil, cocoa, coffee, and seafood. About half of the companies reported having implemented social audits or monitoring mechanisms (such as grievance mechanisms), either with their employees or their suppliers, but the majority of these companies did not disclose the results of these audits. Only 6% of companies in our sample transparently reported both the *percentage* (v.s the number) of structures audited during the year, and the results of the audit (e.g., number of breaches, and remediation). Most companies that have audit systems in place for their suppliers also developed stricter screening criteria and/or certification schemes for selecting their suppliers.

Missing pieces on economic security for employees. Most of the 93 items in *labor protection and human rights* mention the existence of soft policies that promote the respect of basic rights, but with no metrics. Best practices include the number of employees enrolled in trade unions (three companies reporting), information about the minimum notice period (two companies reporting), the breakdown of different contracts (full-time, seasonal, and temporary – one company reporting). The average score for this category is 1.3, and the median is 1.0. We saw one mention of the number of contracts terminated, although the number of jobs created and terminated may be a better proxy for economic impact.

Lack of information regarding income. Income is another key component of well-being. It is a key component of employee living standards, and a proxy for reduced inequality (SDG #10). Only 35% of companies reported on the income of their employees, with an average score of 1.3. Best practice includes the disclosure of entry-level salaries, which allows an interested reader to assess the living standard of employees, and compare it to national standards. Another best practice identified was a thorough assessment of national living conditions in all countries in which the company has operations, and the

design of wages that correspond to a decent living standard (in partnership with the Fair Wage Network[5]). Entry-level wages were not disclosed. The companies did audit their subsidiaries to ensure living wage standards across countries. A low number of companies (three) reported on their supplier wages, but offered convincing metrics, with a score of 2.33. 10% of companies mentioned executive compensation, and one company reported the exact compensation of the top management team. Finally, 25% of companies reported on benefits offered to employees, which ranged from health care coverage to longer maternity leave, flexible working conditions, and commuter assistance.

Emerging metrics for equal opportunities. Approximately half of the companies reported some level of information on their efforts to reduce biased behaviors towards *gender equality* or *equal opportunities*. Most companies did so by disclosing a breakdown of the employee workforce by type (e.g., gender, age, disabilities, and/or minorities). More advanced companies provided a breakdown of their workforce both by gender (or minorities) and by management level, which offered an interesting snapshot of an existing glass ceiling, and the resulting pay gap. 10% of companies (5 companies) addressed the question of gender equality in their human resources strategies, which included paternity leave or gender parity in management. 6% of companies addressed the question of gender equality among their suppliers, particularly for farmers. These companies designed training schemes and employment targets for women, resulting in scores ranging from 2.0 to 4.0. One company (2%) designed training and audits for employers regarding maternity leave and women ability to return to a comparable positions. This company disclosed the number of breaches identified during the audits by continent.

Turnover and satisfaction as the best proxies for the well-being of employees? While assessing well-being indicators for employees and suppliers, the turnover rate, complemented with a satisfaction survey, appeared to be good proxies. We counted 20% of companies (10 companies) that reported on turnover rates, and 31% (15 companies) that communicated about employee satisfaction (self-assessment). None of them

[5] Fair Wage Network. Available from: http://www.fair-wage.com/

provided a narrative about their turnover rate or satisfaction rate, and only one provided a comparison with the peer group.

b. Discussion, better indication of employees well-being are within reach

Companies already provide interesting metrics on employee well-being, but not on a systematic basis. We encountered eight metrics that provided the first assessment of employee well-being at work, all of which were directly extractable from human resources databases (see Table 06). This information can be made available by country or region. All of these metrics could ideally be available for suppliers as well.

Table 06:.Metrics available on employee well-being in company reports

SDG	Stiglitz/Fitoussi well-being categories	Metrics available	Additional narrative	Level of uptake
Gender equality	Economic security	Workforce breakdown by gender and management level + pay gap	The company accompanies the metric with a description of the causes and strategies implemented to tackle the issue + a timeline for evaluation	+++
Equal opportunities	Economic security	Workforce breakdown by minorities and management level + pay gap % disabled		+++
Decent work	Subjective well-being	Turnover rate		++
	Economic security	Breakdown of workforce by type of contract		+
	Income	Hourly entry salary		+

Health	Health	Injury rate or number of days lost	++
Education	Education and skills	Hours of training	++
Peace, justice and strong institutions	Civic engagement and governance	Employee representation in unions	+

Reporting quantitative metrics: + less than 10 companies, ++ between 11 and 24, +++more than 24 companies

Polling technologies now offer opportunities to dig deeper into company impacts on employee well-being. As mentioned in section 3a, employee satisfaction rate, provided that the polling is transparent and conducted by a third party, is an interesting complement to turnover rates. New polling technologies, in particular, those that are associated with natural language processing[6] could test a number of other open questions on recurring managerial problems. The Yale Initiative on Sustainable Finance is currently looking into the ability of natural language processing polls to provide improved information on employee and supplier well-being.

Social media and internet technologies may also contribute to bringing more transparency to employee satisfaction. In the USA, for example, the online platform Glassdoor, a feedback aggregator that discloses anonymous employee feedback and salary estimates, is regularly used by large media groups (e.g., the New York Times, 2015; Forbes, 2015) to address working conditions.

[6] Natural-language processing (NLP) is an area of computer science and artificial intelligence which processes a large amount of natural language data to evaluate trends, preferences, positive or negative feeling associated with concepts.

Section 4. An inconsistent approach to health

Companies can have a direct and indirect impact on the health of many stakeholders. The upcoming section addresses disclosures on health for employees, suppliers, and consumers. Companies can also have a direct impact on global and local community health through environmental protection or pollution. This aspect is covered in Section 2b.

a. Occupational health and safety metrics for employees

A consensus is needed on OHS metrics. *OHS* is covered by 69% of the companies, with more than 80 items listed. A low average score of 1.75 translates as a low willingness for transparency. Most quantitative metrics are lagging indicators, such as the number of injuries, casualties, fatalities, and accidents. Metrics tracking injuries differ widely in form, from 'injury rates' (the most common) to 'number of injuries', 'number of hours lost', 'accident reduction', etc. This finding pleads for greater harmonization of lagging indicators. Only five companies mentioned tracking health and safety concerns of their suppliers through risk evaluation processes or safety compliance.

Is occupational health part of well-being? Fewer than 10% of companies (5 companies) provided information on occupational health and disease, in the form of 'sickness leave' or 'absenteeism'. To assess the relevance of this issue, we performed a literature review, looking for occupational health reporting guidelines, and found only some assessment of corporate reporting on OHS, with mixed results on corporate coverage and quality (Montero et al., 2009; Zanko & Dawson, 2012; Koskela, 2014). The GRI disclosure guideline 403-2 lists the items on OHS, which include occupational disease rate and absenteeism rate. GRI disclosure 403-3 requests disclosure of the number of workers facing high incidence or high risks related to their occupation. The World Health Organization also provides sector guidance on occupational health

and disease protection[7]. We, therefore, conclude that occupational health should be considered an issue of well-being, and it might be useful to understand how companies impact on the health of their employees, prevent and mitigate chronic and acute health risks.

b. Health for consumers: Efforts to reduce malnutrition, an unclear signal on toxicity

Companies focus on nutritional balance and transparency. Half of the companies mentioned some responsibility for offering healthy products, and described their efforts to adapt products to nutritional challenges, mostly regarding sugar, sodium, and fat. Approximately 41% of companies are working on increased transparency for the consumer, including front-of-the-pack labeling with nutritional information, but also information about certification, genetically-modified organism tracking, and organic practices.

Companies recognize a responsibility for their marketing messages. Companies consider that one of their impacts on consumer health is conveyed through marketing. 25% of companies (15 companies) reported some type of effort to develop sustainable marketing towards consumers, such as promoting healthy cooking. Most of the information provided takes the form of a boilerplate or soft policy, but some companies have metrics to support their efforts. The reader would need some sense of scale for these efforts on *sustainable marketing*, for example by providing the percentage of sustainable marketing on the total of the yearly marketing budget.

What responsibility to disclose and mitigate product toxicity? Scientific studies have now demonstrated the toxicity of the repeated consumption of pesticides (WHO, 1990; Mascarelli, 2013; WHO factsheet on pesticide residues, 2018[8]), and of mercury in fish (Oken & Bellinger, 2008; FDA recommendations[9]), on

[7]World Health Organization. About occupational health. Available from: http://www.who.int/occupational_health/en/

[8] World Health Organization fact-sheet on pesticide residue in food. Available from: http://www.who.int/mediacentre/factsheets/pesticide-residues-food/en/

[9] US Food and Drug recommendation regarding fish consumption for pregnant women. Available from: https://www.fda.gov/Food/ResourcesForYou/Consumers/ucm393070.htm

human health and fetal development. Twelve percent of companies addressed efforts to develop organic product alternatives, and 25% mentioned their efforts to reduce chemical inputs, with an average score of 1.6 (see Section 2b). In addition, a portion of the seventeen companies providing sustainability trainings for farmers may be dedicated to the reduction of harmful inputs in food production. One company (2%) addressed the legal risks faced due to a running lawsuit on the toxicity of its herbicide. None of the seafood companies had addressed the question of heavy metals. Unlike for nutrition, we conclude that toxicity has not emerged as a comprehensive issue in agriculture and food production reporting.

c. Discussion on health metrics, the need for rigor

We found that health and safety disclosures lacked a solid reporting framework, and would benefit from a more rigorous assessment. Health reporting for employees is scattered among various metrics, mostly lagging ones. To date, companies do not assess occupational disease in their staff, nor do they explicitly address supplier health concerns.

Regarding consumer health, food and agriculture companies are mostly concerned with the question of the nutritional benefits and transparency of their products. This issue is high on their agenda. An assumption, which needs to be verified, is that this health issue emerged through the involvement of stakeholders in the materiality assessment (see Section 6a on internal governance). Generally, those companies did not assess the *impact* of their products on consumer health, but rather addressed their *efforts* to offering healthy products and mitigating negative effects.

We noticed that only a few companies connected the question of healthy and organic food with a narrative on affordability. Because the price is considered the largest barrier to organic purchasing by consumers (Tranter, 2009), the growth of these markets, as alternatives to potentially harmful consumption patterns, raises the ethical question of unequal access to health for low-income populations.

The issue of consumer exposure to harmful products applies to many other sectors than only the food and agriculture sector (endocrine disruptors, for example, are present in many manufactured goods). Arguably, companies should comply with national, regional, or global health standards, but the debate is complex, as a company's capacity to influence regulatory agendas may reduce compliance thresholds. In 2017, the Monsanto papers exposed the limited ability of the European Food and Safety Agency (EFSA) to deal with corporate influence. The press revealed that the EFSA, which is responsible for assessing the toxicity of food products, had copied and pasted about 100 pages provided by the company Monsanto into the evaluation of the toxicity of the herbicide glyphosate[10,11]. Herein, we argue that corporate influence on democratic structures is one of the most important measures relating to the impact on well-being, as it can negatively affect the setting of standards (see Section 6 on governance, below).

Section 5. The philanthropic role of companies in local and global communities

Philanthropy is still a common channel of communication on company social impacts, with a total of 137 items for our 48 companies.

Philanthropy is still a substantial part of companies' social reporting. All companies report some sort of philanthropic actions. Philanthropy has various purposes: food and fighting hunger (20 companies); education of employees or local communities (10 companies); health protection (10); or community

[10] Euractiv, EU agencies accused of cherry-picking evidence in glyphosate assessment. Paola Tamma, 10 October 2017.
[11] *The Guardian*, EU report on weedkiller safety copied text from Monsanto study. Arthur Neslen, 14 September 2017.

development (24). Up to 29% of companies (14) offered paid volunteering time to their employees, which arguably benefits employee self-fulfillment and well-being.

The shift towards income generation and impact investing. We reported 15 items related to improved livelihood and income generation for employees, suppliers, and communities, particularly focused on farmers. These schemes consist of developing small business opportunities for farmers and communities to raise their standards of living. For example, one company developed a mushroom production scheme in schools to meet the nutritional needs of pupils, with the excess being sold at market. The companies assessed the number of undernourished children over the years, and demonstrated good outcomes, with a sharp decrease in undernourishment. The best practice identified in the field was the systematic assessment of baseline standards of living and the needs of farmers in order to properly evaluate the results of such schemes.

Section 6. Governance disclosure, or the lack of basic information on well-being

The review of governance disclosure revealed two major themes, organized around two SDGs. The first covers all information related to the internal management of the company, its ability to evolve, analyze opportunities, and manage risks (organized under SDG12, Responsible Consumption and Production). The second category includes all reporting information related to the company acting as a good citizen, touching upon company influence on political institutions, and relationships with national authorities (organized under SDG16, Peace, Justice and Strong Institutions). A detailed extract of our mapping on SDG#16 is available in Annex 2.

a. Companies and good corporate governance

Table 07: Disclosure scores and coverage mapped by SDGs labeled in the Corporate Governance ('CG') category and in the Good Citizens ('GC') category and by stakeholder groups

Corporate Governance SDG	SDG 12	
SDG/ Stakeholder groups	Responsible Consumption and Production	% of CG Metrics
Consumers	1.33	8%
Employees	1.00	1%
Global Community		0%
Local Community	1.33	2%
Shareholders	1.32	87%
Suppliers	1.67	2%
All stakeholders	1.33	
Percentage of companies reporting	85%	

Good Citizen SDG	SDG 16	
SDG/ Stakeholder groups	Peace, Justice, and Strong Institutions	% of GC Metrics
Consumers		0%
Employees	3.00	1%
Global Community	1.67	30%
Local Community	1.44	62%
Shareholders	1.50	6%
Suppliers		0%
All stakeholders	1.90	
Percentage of companies reporting	71%	

Stakeholder engagement is common in the assessment of materiality. The majority of items reported on good internal governance were allocated to the shareholder community, as they can affect the value of the company, now or in the future. Thirty-four companies (70%) engaged various stakeholders in the design of their sustainability reports, and 25 performed a materiality assessment, as preconized by the GRI. However, in views of the many disclosure gaps observed in this paper, we argue that a more robust materiality assessment is needed.

A variety of disclosure items on the integration of sustainability governance. We identified no clear trend on governance indicators. About 30% of companies (15 companies) mentioned their board composition, with no clear metrics, and an average score of 0.8. Twenty percent attempted to integrate sustainability concerns in their governance by creating sustainability committees, or organizing round tables with the executive management, while 4% companies tied executive compensation to sustainability outcomes. Thirty percent of companies described a management system for assessing, and providing oversight for,

sustainability risks. Eight percent of companies identified data privacy and security as one of the risks facing the company. Thirty-nine percent of companies mentioned the existence of a code of conduct, and 6% had developed codes of conduct for their suppliers.

b. Companies as good 'citizens'

Information relating to possible conflicts of interest, bribery, corruption, political advocacy, antitrust policies, and taxes are key to the well-being of global and local communities. These items were associated with SDG 16, Peace, Justice and Strong Institutions, and can be correlated with the well-being dimension 'Political voice and governance'. They are critical indicators of companies acting as good 'citizens' towards countries, and create large-scale impacts, both in terms of wealth redistribution, health, and security. We argue that the limited coverage and depth of disclosure of these issues does not match their level of importance.

More transparency is needed on tax payments. Thirty-five percent of companies (17 companies) reported on tax payments, with an average score of 1.82. A score of 2.0 was granted to companies that disclosed the amount of tax paid during the year. Only one company out of the 48 reviewed provided a clear statement on its tax policies. It disclosed the amount of tax paid by country, committed not to use opaque structures or tax havens, and pledged to pay taxes in all of the countries where it operates.

Cherry-picking on lobbying efforts. About 43% of companies (21 companies) mentioned political advocacy or political donations. Most of the items cover advocacy efforts related to positive sustainability issues, such as malnutrition, conflict minerals, and water governance. None of the companies, however, provided an overview of the full lobbying spending across countries and regulations. Two American companies, which are legally mandated to disclose their lobbying budgets and the American officials targeted, indirectly referenced their American lobbying declarations in their sustainability reports. They did

not provide additional information on their lobbying activities outside of the USA. Finally, only four companies mentioned their policies on conflicts of interest, such as the financing of business and academic think tanks.

Soft policies on bribery and corruption. Thirty-three percent of companies (16 companies) reported having put in place policies to fight bribery and corruption, with an average score of 1.43, and a median score of 1.0. Companies scoring 2.0 mentioned the number of bribery training events for their staff and suppliers. Best practices include the development of hotlines for bribery cases, and disclosure of the number of cases reported through such hotlines.

c. Discussion on governance, political voice and security reporting

We identified a large gap in company disclosures quality and depth concerning their influence over the countries in which they operated, which we consider to be the primary channel of impact over local community. We argue that tax payment, lobbying about national and regional regulations and standards, as well as the fight against corruption, can directly affect all dimensions of well-being, such as environmental protections, health, physical security, and economic security.

While many countries are experiencing historic levels of debt, increasing the tax burden on the lower and middle classes, cutting access to public services, and facing lower investment capacities, it is becoming critical for companies to make commitments about the way they pay their taxes. Too few companies addressed the question of taxes in their sustainability reports. It is true that tax information is somewhat already communicated in the audited financial data in the annual report. Nonetheless, because taxes are a key instrument to wealth redistribution and well-being, the sustainability report is a place to go beyond compliance and commit to diligent tax payment. While discussing the impact of companies on well-being, tax payment should be one of the first items on the list, and this conversation is missing.

Another missing disclosure piece is about company influence over regulation. Due to their impact over national employment, but also thanks to substantial spending, companies can easily benefit from the attention of countries representatives. Nonetheless, the societal changes for which they advocate are not publicly disclosed. A few countries, such as the USA, legally request companies to disclose quarterly the amount of spending on lobbying and the regulations targeted. The exact content of the request remains unknown. Best practices for lobbying consist of full disclosure of the lobbying spending by country, a list of regulations targeted, and transparency on the changes requested (e.g., amendments tabled, policy papers). It also consists in full disclosure of their support to think tanks, NGOs, and academic research, which can produce lobbying material, as exemplified by the case of Exxon in financing climate-denial studies (Farrel, 2016). Once again, no serious discussion on well-being indicators can take place if the question of company influence on a country is not addressed.

Finally, more information could be disclosed on company efforts to curb bribery and corruption but no clear indicator exist. According to the literature, the more a company is exposed to corruption, the less likely it is to openly communicate its anticorruption engagement (Barkmeyer, 2015; Healy & Serafeim, 2016) Few self-assessment exist, including a tool from Transparency International.

Section 7. Overlap with data-provider metrics

We reviewed the indicators of three mainstream data- and index-providers: Bloomberg[12], DataStream[13], and the Dow Jones Sustainability Index. This analysis has limitations, both in the selection of institutions

[12] For this paper, we reviewed the metrics selected by Bloomberg in its ESG snapshot (Excel sheet). Bloomberg also provides, in another document, corporate disclosure against the SASB information and rating from various rating agencies.

[13] Datastream is one of the ESG product developed by Thomson Reuters. It is not the only one.

reviewed and in the depth of the analysis. We decided, however, to provide a few preliminary results that complement the findings of this paper. More benchmarking is needed to assess the comparability and quality of the information channeled by data-providers to investors.

The three institutions have different focuses. Bloomberg's strength is on environmental indicators, DataStream has an even representation across the three fields, while Dow Jones leans towards social information. Dow Jones is the only institution gathering information on the activities of companies as good citizens. Table 08 offers a snapshot of the kind of information requested (quantitative metrics vs. policies) classified under environmental, social and governance data. The most covered environmental issues are those relating to climate change, with a total of 27 items across the three sources of information relating to GHG emissions and climate, and 23 on energy management. Eleven items were reported for water management, seven for waste, and three for chemicals.

Table 08: Coverage of environmental, social and governance issues by Bloomberg ESG, DataStream and DowJones Sustainability Index.

	Environmental	Social	Internal governance	Good citizens'	TOTAL
Bloomberg total	33	14	38	0	85
Bloomberg Quantitative Metrics	*30*	*8*	*32*	*0*	
Bloomberg Policies	*3*	*6*	*6*	*0*	
Bloomberg %	*39%*	*16%*	*45%*	*0%*	
Datastream total	46	39	33	0	118
Datastream Quantitative Metrics	*43*	*30*	*27*	*0*	
Datastream Policies	*3*	*9*	*6*	*0*	
Datastream %	*39%*	*33%*	*28%*	*0%*	
DJSI total	11	33	29	16	89
DJSI Quantitative Metrics	*6*	*19*	*15*	*9*	
DJSI Policies	*5*	*14*	*14*	*7*	
DJSI %	*12%*	*37%*	*33%*	*18%*	
TOTAL COUNT	**90**	**86**	**100**	**16**	**292**
TOTAL %	***31%***	***29%***	***34%***	***5%***	

In Table 09, we organized topics based on their occurrence among the three data-providers. We observed a coverage quite similar to company coverage (e.g., GHG emissions, energy management, waste, equal

opportunity, retention). Taxes, political advocacy, and employee satisfaction are less consensual issues among data-providers.

To conclude this short analysis of common indicators among data-providers, we identified similar consensuses and gaps in the topics covered by companies

Table 09: Occurrence of topics across Bloomberg, Datastream and DowJones Sustainability Index

3 institutions	2 institutions	1 institution
Energy Management	Environmental monitoring	Chemicals
Waste	mechanisms	Water quality management
GHG emissions	Transportation	Green building
Health and safety	Benefits	Reporting practices
Compensations	Employee training	Spills
Labor protection and human rights	Social audits and monitoring	Biodiversity
Retention	Philanthropy	Employee satisfaction
Equal opportunities	Customer satisfaction and	Employee engagement in
Gender equality	engagement	governance
Board composition and	Stakeholder engagement and rights	Code of conduct
independence	Bribery and corruption	Privacy and security
Risk and crisis management		Antitrust
Executive compensation		Political advocacy
Environment management plan and		Taxes
systems		

IV. Conclusion

Companies provide a substantial amount of information on their pursuits to become more sustainable. The majority of this information directly or indirectly relates to the well-being of their stakeholders, such as efforts to protect the environment, now and in the future, stakeholder working conditions, health, and security. By shifting our analytical framework from the traditional ESG classification to mapping between stakeholders and development goals, we identified several consensuses and gaps in the corporate reports we analyzed.

The most common indicators reported by companies related to climate change, the energy transition, waste, social audit and monitoring and gender equality. These indicators are channeled to investors via data-providers, such as Bloomberg, DataStream, and Dow Jones. For most of the other indicators, the information can be either insufficiently reported by the companies, or insufficiently channeled by the data-providers.

A number of other gaps have been identified. Companies could strengthen the monitoring of their local environmental impacts, such as water pollution, air pollution, biodiversity loss, and impact on the nitrogen cycle. To do so, new approaches have been created. A few tools propose moving away from the quantitative *attribution of impacts* to *contribution to impact*. Through sensors and satellite data, maps can locate high-risk areas where a company's operations might contribute to an identified environmental risk. The question is no longer how much of an impact can be attributed to a company, but rather how can the company mitigate, individually and collectively, a given risk in the targeted area. Such tools already exist for water stress and deforestation. We hope to see the development of more of these for air pollution, biodiversity loss, and nutrient cycles. In parallel, biophysical accounting tools, associated with trade data, may be able to provide more information on the environmental impacts of one crop ton, based on its origin. Better measurement of environmental impacts may improve local environmental protection and therefore local communities' well-being.

Company reporting on employee and supplier well-being is weak overall, but best practices exist, and are well documented. Key performance indicators are easily extractable from human resources data. Rigorous screening and auditing of subsidiaries and suppliers is critical to ensuring the enforcement of corporate policies. Full disclosure of the audit results also provides a strong basis for discussion.

More information could be required, relating to the economic security of employees, including data on entry-level income, contract type, and number of people recruited and dismissed. Information on employee satisfaction can be extracted from employee surveys, and, as natural language-processing becomes mainstream, companies will be able to get better information about the key concerns of their employees, including possible data on occupation illnesses or stress related to work, personal life balance, and relationships with management.

Finally, as research demonstrates an increasing concern with chemical inputs on consumer, farmer, animal, and plant health, we expect more effort to be made on health impacts related to chemical inputs, as well as mitigation efforts. This is true for the food and agriculture sector, but reporting on environmental health concerns applies to numerous other sectors.

Based on these results, it appears that the current reporting framework leaves aside many important issues related to well-being. We encourage future research to design a more rigorous reporting framework, perhaps based on an improved materiality assessment.

It also appears that companies provide *effort-driven* metrics, as opposed to *impact metrics* that would measure the effects of their actions on stakeholders. From this first glance, only a few metrics reported by companies are able to convey information about their effects. We have identified, in particular, the Aqueduct water risk scarcity assessment, which is likely to be more of an operational risk assessment than a local community impact assessment, and employee satisfaction polls.

To conclude, well-being is an interesting lens to flag existing disclosure gaps. However, shall we expect from companies to communicate on their impacts, even though such impacts can be diluted, and difficult

to monitor? Or is sustainability reporting rather designed to communicate company efforts and policies, addressed in a measurable way? As the research continues to question what the right metrics are for measuring business impacts on well-being, the question of company's role in producing such data is critical. Most probably, independent data, produced by new technologies, such as satellites, social media, employment data, justice data, and environmental sensors, will provide a new generation of impact measurements. It is unclear, however, whether we should expect companies to be leaders in the design of such metrics.

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Annex 1a. Average and median scores by disclosed topics.

Issue in materiality spreadsheet	Total items	Average Score	Median Score
Access to clean and/or sufficient water	19	2.8	3.0
Air pollution	6	2.0	2.0
Animal welfare	37	1.5	1.0
Anti-trust	4	1.5	1.0
Benefits	14	1.6	1.0
Biodiversity	29	1.5	1.0
Board composition/independence	21	0.8	1.0
Bribery & corruption	23	1.4	1.0
Chemicals	15	1.7	1.0
Code of conduct	23	1.4	1.0
Compensation	21	1.5	1.0
Conflict of interest	4	1.0	1.0
Crisis & risk management	18	1.1	1.0
Customer satisfaction & engagement	7	1.4	1.0
Education philanthropy	18	1.4	1.0
Employee satisfaction	15	1.7	2.0
Employee training (non-sustainability)	45	1.7	2.0
Employee engagement in governance	18	1.1	1.0
Energy management	79	2.1	2.0
Environmental management plans and systems	31	1.4	1.0
Environmental monitoring mechanism	6	2.2	2.0
Environmental regulatory compliance	18	1.4	1.5
Equal opportunity	46	1.9	2.0
Executive compensation	8	1.8	1.0
Food security	26	1.4	1.0
Gender equality	44	2.2	2.0
GHG emissions/Climate change	91	2.3	2.0
Green building	10	1.3	1.0
Health and safety	160	1.8	2.0
Indigenous rights	3	1.0	1.0
Labor protection/Human rights	96	1.3	1.0
Livelihood and income generation	18	2.1	2.0
Local sourcing of products	9	2.4	2.0
Philanthropy	90	1.3	1.0
Political advocacy and lobbying	21	1.5	1.0
Privacy & security	5	1.2	1.0
Product labeling	36	1.4	1.0
Product packaging	36	2.1	2.0
Product safety	37	1.8	2.0
Reporting practices & stakeholder engagement	56	1.6	2.0
Retention	10	2.6	2.0
Social audits and monitoring	43	2.1	2.0
Spills	3	2.0	2.0
Supply chain transparency	10	1.7	2.0
Sustainability in corporate governance	15	1.2	1.0
Sustainability training	26	1.8	2.0
Sustainable agriculture innovation	44	1.4	1.0
Sustainable marketing	21	1.3	1.0
Sustainable seafood	29	1.6	1.0
Sustainable sourcing of commodities (environmental and social)	98	1.9	2.0
Taxes	17	1.8	2.0
Transportation	18	1.8	2.0
Waste	63	2.2	2.0
Water quality management	18	1.8	2.0
Water resource management	53	2.2	2.0

Annex 2. Extracts of our mapping by stakeholder group and SDG for a selection of SDGs

SDG	Topic	Stakeholder	Total Items	Number of Companies	Average Score
6. Clean Water and Sanitation	Access to clean and/or sufficient water	Consumers	0	0	
		Employees	2	2	4.0
		Global community	0	0	
		Local community	15	11	2.7
		Shareholders	0	0	
		Suppliers	2	2	2.0
	Water quality management	Consumers	0	0	
		Employees	0	0	
		Global community	0	0	
		Local community	18	15	1.8
		Shareholders	0	0	
		Suppliers	0	0	
	Water resource management	Consumers	0	0	
		Employees	0	0	
		Global community	45	34	2.4
		Local community	9	8	1.7
		Shareholders	0	0	
		Suppliers	0	0	

SDG	Topic	Stakeholder	Total Items	Number of Companies	Average Score
16. Peace, Justice, and Strong Institutions	Anti-trust	Consumers	0	0	
		Employees	0	0	
		Global community	0	0	
		Local community	0	0	
		Shareholders	4	4	1.5
		Suppliers	0	0	
	Bribery & corruption	Consumers	0	0	
		Employees	0	0	
		Global community	0	0	
		Local community	23	22	1.4
		Shareholders	0	0	
		Suppliers	0	0	
	Conflict of interest	Consumers	0	0	
		Employees	0	0	
		Global community	4	4	1.0
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	0	0	
	Political advocacy and lobbying	Consumers	0	0	
		Employees	1	1	3.0
		Global community	0	0	
		Local community	20	16	1.5
		Shareholders	0	0	
		Suppliers	0	0	
	Taxes	Consumers	0	0	
		Employees	0	0	
		Global community	17	17	1.8
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	0	0	

SDG	Topic	Stakeholder	Total Items	Number of Companies	Average Score
8. Decent Work and Economic Growth	Employee satisfaction	Consumers	0	0	
		Employees	15	15	1.7
		Global community	0	0	
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	0	0	
	Employee training (non-sustainability)	Consumers	0	0	
		Employees	45	33	1.7
		Global community	0	0	
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	1	1	1.0
	Employee engagement in governance	Consumers	0	0	
		Employees	18	12	1.1
		Global community	0	0	
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	0	0	
	Labor protection / Human rights	Consumers	0	0	
		Employees	52	26	1.6
		Global community	0	0	
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	52	26	1.0
	Retention	Consumers	0	0	
		Employees	10	10	2.6
		Global community	0	0	
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	0	0	
	Social audits and monitoring	Consumers	0	0	
		Employees	15	12	2.6
		Global community	0	0	
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	32	23	1.9
10. Reduced Inequalities	Benefits	Consumers	0	0	
		Employees	14	12	1.6
		Global community	0	0	
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	0	0	
	Compensation	Consumers	0	0	
		Employees	18	17	1.3
		Global community	0	0	
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	3	3	2.3
	Equal opportunity	Consumers	0	0	
		Employees	45	28	1.9
		Global community	0	0	
		Local community	0	0	
		Shareholders	0	0	
		Suppliers	2	2	1.5
	Executive compensation	Consumers	0	0	
		Employees	0	0	
		Global community	0	0	
		Local community	0	0	
		Shareholders	8	6	1.8
		Suppliers	0	0	
	Indigenous rights	Consumers	0	0	
		Employees	0	0	
		Global community	0	0	
		Local community	3	3	1.0
		Shareholders	0	0	
		Suppliers	0	0	

Annex 3. List of companies reviewed

Company

AB inBev

Ahold

Albertsons

Algar

Amaggi

Archer Daniels Midland

Bunge

Casino Group

Charoen Pokphand Foods

Chinatex

Coca-Cola Company

Cofco

Costco

Crh Beer

Danone

Delhaize

Diageo

Dunkin Brands

Dupont

FrieslandCampina

Group Calvo

Heineken

Itochu Corp

Kellogg Company

Kroger

Marfrig Global Foods

Marks & Spencer

Marubeni

McDonald's

Metro

Minerva Foods

Mitsubishi

Molinos

Monsanto

Nestle

Nidera

Noble Group

Nutreco

Olam

PepsiCo

Smithfield

Syngenta

Thai Union Group

Tyson Foods

Uni-President Enterprises

Unilever

Wal-Mart

Wilmar International