




“Toward a novel Sustainability Transparency Index for improved governance in agri-food value chains: A comparative study of Finnish and Ukrainian companies”

AUTHORS	Inna Makarenko   Bodo Steiner Kateryna Yuhai
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Kateryna Yuhai, 2024

Inna Makarenko, Doctor of Economics,
Professor, University Researcher,
Department of Economics and
Management, University of Helsinki,
Finland; Associate Professor,
Accounting and Tax Department,
Sumy State University, Ukraine.
(Corresponding author)

Bodo Steiner, Ph.D., Professor, Food
Economics & Business Management,
Department of Economics and
Management, University of Helsinki,
Finland.

Kateryna Yuhai, Research Assistant,
Department of Economics and
Management, University of Helsinki,
Helsinki, Finland.



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Inna Makarenko (Ukraine), Bodo Steiner (Finland), Kateryna Yuhai (Finland)

TOWARD A NOVEL SUSTAINABILITY TRANSPARENCY INDEX FOR IMPROVED GOVERNANCE IN AGRIFOOD VALUE CHAINS: A COMPARATIVE STUDY OF FINNISH AND UKRAINIAN COMPANIES

Abstract

The paper addresses ESG-based disclosure and transparency measurement in the context of a comparative analysis of Finnish and Ukrainian agri-food businesses based on the Sustainability Transparency Index (STI) and Sustainable Development Goals (SDG). Based on the normalization method, SDG-related text mining, and qualitative text analytics, the sustainability information of the largest agri-food companies was traced. Among GRI, ISSB, and ESRS disclosure standards, only GRI 13 has clearly established SDG alignment with most material stakeholders' requests. The results of the study give a snapshot of sustainability transparency in the agri-food business in 2023, where the indices of Finnish companies are higher than those of Ukrainian ones, with clear SDG 12, waste and water management priority compared to SDG 2 and sustainable agriculture in Ukraine. Regulatory recommendations based on a comparative analysis of sustainability disclosure in both countries include better alignment with EU (Finnish) benchmarks, reporting and assurance practices for Ukrainian companies, and the incorporation of recent EU sustainability disclosure approaches for Finnish companies.

Keywords

sustainable investment, agri-food businesses,
transparency, ESG, Sustainable Development Goals

JEL Classification

E01, Q01, Q10, M40, M41

INTRODUCTION

Despite Finland's leadership and progress in the 2021 Sustainable Development Goals (SDGs) ranking (SDR, 2022), the COVID-19 pandemic and war in Ukraine have demonstrated how fragile the achievement of food-related SDGs is (SDG 1 to SDG 8; UN, 2021). This fragility reflects the unprecedented threats to the resilience and sustainability of local and global agri-food value chains (AFVCs), which are projected to be "pushing countries short on food to famine" (WEF, 2022a), contributing to a "global food and energy crisis" (WEF, 2022b). To address the global food, energy, and climate crisis and the achievement of food-related SDGs, it is evident that public and private investment is needed at unprecedented levels, including a doubling of climate finance by 2040 (Timperley, 2021). Yet international private sector investment in agriculture fell by 57% in 2020 (UNCTAD, 2020), while ESG (environmental, social, governance) investment inflows of the largest sustainability funds fell by 35.7% since the beginning of the war in Ukraine (Agnew et al., 2022; Morningstar, 2022). SDG respon-

sible investment gap was only deepened after that time, as well as threats to the SDG progress achievement in general and global food security in particular. More consolidated efforts of accounting and reporting standard-setters towards greater transparency in agri-food companies' sustainability reporting are needed to bridge that gap and accelerate SDGs, especially SDG 2 and other AFVC-related SDG progress by 2030.

Interoperability and standardization of sustainability reporting frameworks, on the one hand, are prerequisites for transparent disclosure of agri-food businesses; on the other hand, transparent and SDG-oriented disclosure of such companies creates the ground for better responsible investment allocation and good governance in AFVC. The crucial point in that disclosure-governance interrelation is sustainability and SDG transparency assessment in the agri-food sector.

1. LITERATURE REVIEW

The main issue in the sustainability and transparency landscape is to what extent the lack of transparency – as a quality of corporate social responsibility (Fernandez-Feijoo et al., 2014; Mol, 2015; Pucker, 2021; Agnew et al., 2022) – is responsible for poorer sustainability governance in AFVCs (Gardner et al., 2019; Gereffi & Lee, 2016, 2021; Steiner, 2017; Steiner & Brandhoff, 2021), leading to lower and/or misguided investment decisions and slowing down SDGs progress. For AFVC companies' disclosure, it is crucial to identify the most material stakeholder requests and link them with relevant SDGs for more effective and transparent communication (Sukhonos et al., 2018).

In the case of SMEs, this was done by Kovalov (2024), paying particular attention to disclosing the most relevant information following SDGs 2, 8, 9, 12, and 13 (both environmental and social-oriented). However, most publications are environmentally focused (Vorontsova et al., 2022; Shevchenko et al., 2021; Altarawneh, 2023; Bai et al., 2024).

In light of this core issue (how the lack of transparency in ESG disclosure can slow down SDGs progress), modeling the link between ESG and SDG performance (Soni, 2023), SDG and ESG disclosure interrelation (Plastun et al., 2020), CSR and sustainable development determination (Wiguna et al., 2023) transparency of AFVC and SDG intersection is crucial.

An important focus on the EU member states (regional perspective) with exploring the linkages between the SDGs and their impact on the SDG progress was made by Kostetckaia and Hametner (2022) and Thammaraksa et al. (2024).

The considerable differences in sustainability reporting metrics and KPI across different frameworks (Global Reporting Initiative (GRI), International Integrated Reporting Council (IIRC), Sustainability Accounting Standard Board (SASB), and Climate Disclosure Project (CDP)) could threaten transparency in value chains (Goswami et al., 2023).

To solve the problem, key standard-setters created sector-specific reporting requirements (both voluntary and mandatory) addressing SDG disclosure, especially for sectors with high sustainability impacts, such as the agri-food sector.

According to the EU course, the newly adopted European Sustainability Reporting Standards (ESRS) are more relevant to Ukraine than others. Specific standards are expected in the ESRS framework. However, the implementation date has not yet been planned.

Another example of such a framework is 'Appendix B Industry-based disclosure requirements Volume B20 Agricultural Products' of the International Financial Reporting Standards Sustainability Disclosure Standard IFRS S2 Climate-related Disclosures. However, it is still a draft version, and moreover, there are no clear links to the most material SDG targets and indicators.

In contrast, the GRI has developed 'Sector Standard 13 for Agriculture, Aquaculture, and Fishing' active from 2024 to guide organizations within these sectors on how to disclose their impacts related to sustainability. This sector-specific standard aims to enhance transparency and accountability in areas such as environmental stewardship, resource use, and social responsibility within agriculture, aqua-

culture, and fishing sectors. This approach promotes a deeper understanding of the sector's impacts on biodiversity, water use, emissions, labor practices, and community engagement (GRI, 2024). GRI is the first globally recognized system of standards, which is supported by Rajic et al. (2022).

In GRI standard 13, the agriculture, aquaculture, and fishing sectors are best positioned to contribute to several SDGs: SDG 2 Zero Hunger (food security), SDG 1 No Poverty, SDG 8 Decent Work and Economic Growth (biggest employer), SDG 12 Responsible Consumption and Production (managing natural resources sustainably and efficiently), SDG 15 Life on land (revitalize rural landscapes), SDG 14 Life Below Water (maintain healthy marine and aquatic ecosystems) and finally SDG 13 Climate Action (adaptive respond to climate change).

Considering the necessity of aligning AFVC companies' disclosure with the most relevant SDGs (1, 2, 8, 12, 14, and 15) and standard-setters approach, existing approaches to sustainability transparency assessment or indexing (STI) need to be updated with the SDG focus.

This paper highlights the key feature of transparency as a quality of corporate social responsibility (CSR) in AFVCs, thereby contributing to the sustainability disclosure and governance debate (Agnew et al., 2022; Fernandez-Feijoo et al., 2014; Papoutsi & Sodhi, 2020; Pucker, 2021; Mol, 2015). More specifically, this study aims to address ESG criterion, SDG disclosure, and transparency measurement in the context of a comparative analysis between Finnish and Ukrainian agri-food businesses, advancing the conceptual and empirical basis of the Sustainability Transparency Index (STI).

2. DATA AND METHODOLOGY

This study used the trustworthy governance criteria and rankings to select a relevant business candidate pool from Finnish and Ukrainian AFVCs.

Ten out of 100 largest companies in the Ukrainian agricultural sector, ranked by the volume of the land bank (Latifundist, 2024) in 2023, were selected for the analysis. Based on the content analysis of

the websites and sustainability reporting, for the same year, a set of explicit variables was formed to identify STI indicators and SDG adherence level. Some companies have listed their shares on the Warsaw Stock Exchange (Astarta, KSG) or the London Stock Exchange (MHP).

The study examined a database of the largest companies in the Nordic countries to select Finnish companies, resulting in a list of the largest companies (2024).

Three different methodological approaches were utilized to achieve the paper's aim:

- STI calculation by the normalization method;
- STI advancement: SDG disclosure and prioritization with SDG keyword scrapping tool JRC SDG Mapper;
- Text mining and qualitative text analytics with Scanner 2030, JRC SDG Mapper and Inranodus.

STI calculation by the normalization method is based on Makarenko et al. (2023); Makarenko et al. (2022 a, b) include the following criteria for tracing sustainability reports (information) of AFVC companies:

- Disclosure on sustainability, ESG or SDG companies' activities or CSR initiatives;
- Availability the policy on ESG, sustainability, and CSR;
- Frequency of sustainability or ESG disclosures;
- Adherence to national and European regulations for ESG, SDG, or sustainability reporting on ESG, SDG, or sustainability;
- CSR Standards and practices;
- Third-party assurance of financial reporting or sustainability reporting verification, supplier or value chain audit;
- Auditor opinion (unqualified, qualified; disclaimer of opinion; adverse opinion for finan-

cial reporting; limited and reasonable assurance for sustainability reporting);

- Disclosure and clear mention of companies' activity alignment to relevant ESG criteria (G includes anti-corruption matters);
- Disclosure and clear mention of companies' activity alignment to relevant SDG;
- Other ESG/SDG KPI.

However, compared to previous research using the normalization method, this study focused on SDG disclosure and prioritization in Finnish and Ukrainian companies' reporting. Before including only SDG discovery in company disclosures, the STI baseline calculations did not include prioritizing goals and targets.

Considering the necessity of aligning AFVC companies' disclosure with the most relevant SDGs (1, 2, 8, 12, 14, 15) and standard-setter approach, the existing approaches to sustainability transparency assessment or indexing SDG focus should be added.

For that reason, SDG-oriented text scrapping of the sustainability information was made. Similar to Dzhunushalieva and Teuber (2024), this study uses the 'Knowledge Base for the Sustainable Development Goals' features of the JNR SDG Mapper tool, which acts as a central resource for EU policies, indicators, and data concerning the SDGs (EC, 2024).

This platform employs natural language processing (NLP) techniques to identify mentions of the SDGs within uploaded files in different languages. After detecting references to the SDGs, machine learning algorithms are utilized to identify corresponding SDG co-occurrences, tags, targets, and indicators. This analysis incorporates rule-based methods to pinpoint specific keywords or phrases linked to each SDG. SDG priority in company disclosure was represented with bar charts, highlighting the SDGs' text tags' frequency and SDG prominence. The bubble charts were used to visualize the interconnectedness between SDGs and their targets (Dzhunushalieva & Teuber, 2024).

Text mining and qualitative text analytics are the final stages of sustainability information analysis

based on Scanner 2030 and Infranodus software for cloud and mind mapping. Scanner 2030 is a knowledge base composed of terminology associated with the SDGs. It allows, through an automatic mass tagging process, to classify the texts entered according to their relationship with the SDGs and their respective goals (Political Watch, 2024).

Instead of VOSviewer in Dzhunushalieva and Teuber (2024) and complementarily to Scanner 2030 (Aguado-Correa et al., 2023), this study used the mind maps and qualitative text analytics module of Infranodus, which gives the qualitatively measurable cauterization opportunities for tracing sustainability information.

3. RESULTS AND DISCUSSION

3.1. STI calculation under the normalization method

Following the predefined approaches, Tables 1 and 2 present extracts of the calculation of STI for Ukrainian and Finnish companies.

Level of sustainable transparency of Ukrainian companies varies significantly – from the highest level of disclosure for MHP (leader), Kernel and Astarta (A-ranked) to middle (KSG, IMC, Continental Farmers Group (B-ranked) and lower level for Ukrlandfarming, Epicentr Argo, Enselko, Ukrprominvest (D-ranked).

A-ranked companies have a comprehensive set of sustainable policies, demonstrate persistence in sustainability disclosure of ESG and SDG-related actions and initiatives in accordance with well-known frameworks and standards, and devote a specific section to sustainable information in their annual reports.

For example, MHP has environmental and social matters policies, employees, human rights, anti-corruption, and anti-bribery policies. Kernel utilizes environmental and social capital disclosure methodology alongside TCFD standards for environmental capital disclosure, ISCC, ISO14001, and ISO18001 for social capital disclosure, and GRI standards for overall reporting presentation.

Table 1. STI calculations for Ukrainian sample companies in 2023 (extract)

Source: Authors' calculations.

Company	Type of report	Sustainability standard	The type of auditor's opinion	STI, %	Rank
MHP	Section in the Annual report	TCFD, ISCC, SDG, GRI etc.	Unqualified	92.3	A
Astarta	Section in the Annual report	ESRS, EU Taxonomy etc.	Unqualified	92.3	A
Kernel	Section in the Annual report	TCFD, ISO, SDG, GRI etc.	Qualified	84.6	A
KSG	Section in the Annual report	–	Qualified	76.9	B
IMC	CSR report	–	–	61.5	B
Continental Farmers Group	Investments in social projects and tax payments report	–	–	61.5	B
Ukrlandfarming	Website info	–	–	30.8	D
Epicentr Argo	Website info	–	–	30.8	D
Enselko	Website info	–	–	30.8	D
Ukrprominvest	Website info	–	–	30.8	D

Providing the link to well-recognized reporting frameworks in companies' reporting is a good sign from a company to stakeholders appealing to their most material informational needs. According to Goswami et al. (2023), GRI-aligned reporting is the most comprehensive. TCFD is an important normative institutional framework for meeting the information needs of capital markets and investors, while SDGs are the most respected global moral sustainability compass.

Only Astarta, among the A-ranked companies, provides EU taxonomy, ESRS-aligned disclosure, GHG Protocol Standards, IPCC Guidelines for greenhouse gases inventory and calculation, and IPCC's Sixth Assessment Report, 2022 (AR6) for global warming potential.

B-ranked companies provide detailed sustainability and CSR disclosure without a solid methodological basis (no precise alignment with recognized ESG frameworks, no SDG priorities, and well-structured internal sustainability policies).

The most basic level of disclosure is for companies rated D, with the basic ESG information disclosed in relevant CSR sections of their websites. For instance, on Enselko and Ukrprominvest websites, information relevant to the current study is described in the mission and values section or the environmental project section.

However, none of the Ukrainian companies (A-ranked in particular) provide independent verification of their sustainability information, and none of the B and C-ranked companies (except KSG) dis-

close the independent auditor opinion even on the financial statements. While the assurance of sustainability information is not obligatory in Ukraine yet, auditor verification is a clear signal for company transparency, primarily when an unqualified opinion is issued.

Finnish companies (Table 2) have a higher level of transparency than Ukrainian companies (8 out of 10 companies are A-ranked). Only one company has a website that discloses CSR information.

Most of the sustainability reports monitored follow various food standards (FSSC 22000, IFS, approved by the Global Food Safety Initiative (GFSI, IFC or BRC, ISO)), labels, and audit schemes (e.g., SMETA (Sedex Members Ethical Audit) or RSPO supply chain audits).

As in the case of Ukrainian companies, GRI is the most frequently reporting framework for indexing and containing sustainable information.

An important feature of Finnish companies' disclosure is independent limited assurance of sustainability information. Auditors implemented International Standards on Assurance Engagements (ISAE 3000) for limited assurance opinions to verify companies' emission data (Scope 1 and 2) and GRI standard adherence (Raisio, Valio, Lantmännen Agro).

However, only the Lantmännen Agro report clearly describes EU Taxonomy metrics. Only Fazer provides the double materiality assessment results of the most relevant sustainability topics

Table 2. STI calculations for Finnish sample companies in 2023 (extract)

Company	Type of report	Sustainability standard	Type of auditor opinion	STI, %	Rank
Raisio	Annual Review and CSR	ISO, SDG	ISAE 3000, limited assurance	100.0	A
Valio	Sustainability report	GRI, CDP, EcoVadis	ISAE 3000, limited assurance	100.0	A
Lantmännen Agro	Section in Annual report	SDG, EU Taxonomy, UNGC, GRI	ISAE 3000, limited assurance	100.0	A
Polarica	Sustainability report	SSC 22000, BRC, IFS Food, and the HACCP system, ISO	SMETA (Sedex Members Ethical Trade Audit)	92.3	A
Apetit	Section in Annual report	BRC, SDG, GRI	BRC and suppliers audit	92.3	A
Hkscan	Annual and Responsibility Report	FSSC 22000, IFS or BRC	BRC and suppliers audit	92.3	A
Fazer	Section in Annual report	Science Based Target Initiative, CSRD, FSSC 22000, IFS, ISO, UNGC etc.	SMETA, RSPO	92.3	A
Atria	Corporate Sustainability Report	SDG, UNGC, GRI	ISO assurance	92.3	A
Nordzucker	Section in Annual report	ISO, FSSC 22000 etc.	Unqualified	69.2	B
Hätäla	Website info	BRC	-	46.2	C

(climate and circularity, sustainable products and innovations, sustainable sourcing, people, and well-being).

In both countries, lower-ranked companies typically disclose sustainability and CSR information on their websites without a separate sustainability section in annual reports or stand-alone reports. GRI is the most frequently used reporting framework in both countries.

Such results align with the conclusions of Elalfy et al. (2021), where larger or listed companies from higher sustainability impact sectors, which incorporate GRI standards and have external assurance, are more likely to report on the SDGs. Rajic et al. (2022) also confirm GRI's importance for AFVC companies (plant-origin food companies' reporting).

3.2. STI advancement: SDG disclosure and prioritization

JRC SDG Mapper provided a new focus in the AFVC companies' reporting tracing with SDG. The main slide shows the SDGs detected in the relevant set of sustainable reporting (information) of Ukrainian (Figure 1) and Finnish companies (by ranking, Figure 2). A second slide provides granular information at the level of the detected SDG targets for Ukrainian (Figure 3) and Finnish companies (Figure 4), respectively. General SDG disclosure characteristics detected by text scraping for Ukrainian companies are presented in

Appendix A; for Finnish companies – in Appendix M. Detailed companies' data are presented in Appendices B to L; for Ukrainian companies; in Appendices N to X (Appendices are available at <https://zenodo.org/records/13842961>).

As a benchmark for SDG prioritization, GRI Standard 13 defined most material stakeholder requests relevant to SDG (1, 2, 8, 12, 14, 15).

Although some companies in the sample do not disclose relevant information about SDGs or company alignment to the UN SDG 2030 Agenda (Ukrlandfarming, Epicentr Argo, Enselko, Ukrprominvest), they use SDG-relevant keywords to describe their sustainability-related projects and initiatives. This enables the application of SDG-scraping techniques.

For Ukrainian companies (Figure 1), the high-level priority was given to SDG 2 (21.2%), SDG 13 (14.7%), and SDG 16 (13.8%). SDG 16 was relevant mainly because of anticorruption practices and initiatives of business donations and defense support in the Russian-Ukrainian war.

Goals 7 and 8 are almost equal in their percentage of co-occurrences. The remaining SDGs from the GRI 13 standard (12 and 15) are irrelevant for Ukrainian AFVC companies. The least important of this list is SDG 14.

Compared to the Ukrainian sample, the Finnish sample's main SDG disclosed is SDG 12 (34,8%) in-

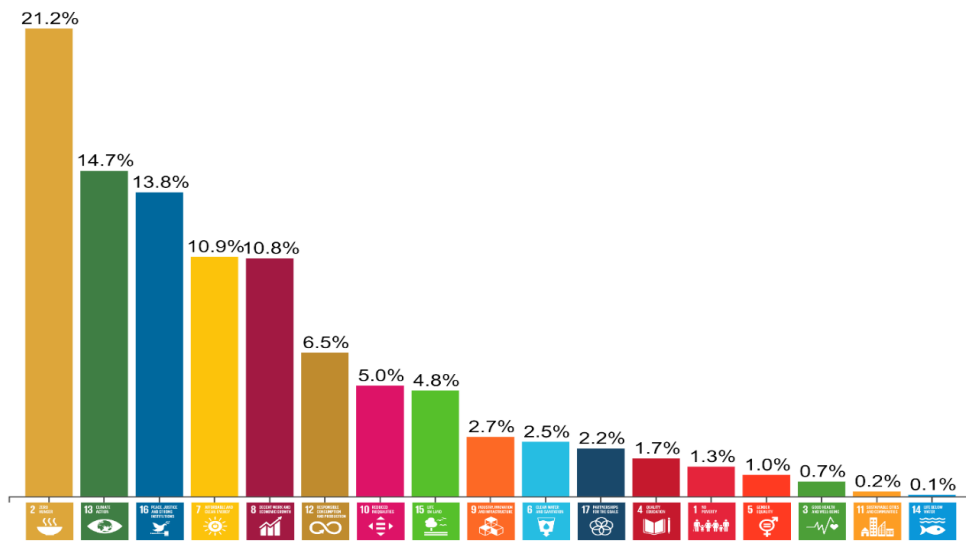


Figure 1. Most relevant SDGs in Ukrainian company sustainability reporting (in order of priority, the percentage of co-occurrences corresponding to each goal)

stead of SDG 2 (Figure 2). Agriculture in Ukraine is extensive and intended for primary plant and livestock production, which affected a company’s projects and disclosure.

Finnish companies are more oriented towards circular economy technologies, waste, and water management, and more intensive and responsible

ways of production and consumption with higher added value in supply value chains.

SDGs 7, 13, and 8 (11.1-9.4%) are almost equal in their percentage of co-occurrences, confirming alternative energy, climate change mitigation, and sustainable growth targets of European green transition and Finnish agri-food sector priorities.

Sources: Created by the authors via JCR SDG Mapper.

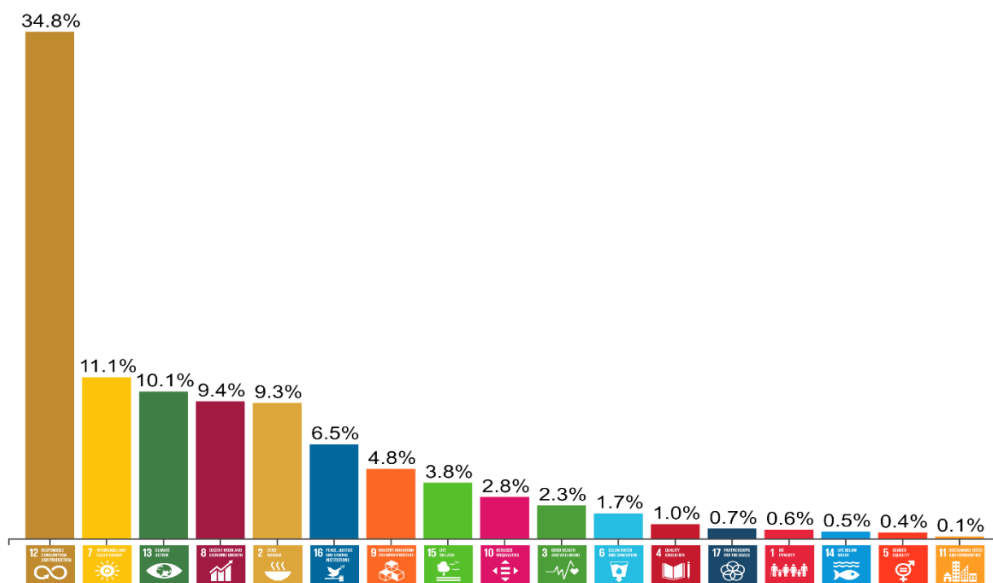


Figure 2. Most relevant SDGs in Finnish company sustainability reporting (in order of priority, the percentage of co-occurrences corresponding to each goal)

SDG 14 and 15 have not displayed a high percentage of co-occurrences in Finnish AFVC reporting. Tables 3 and 4 present the company-level breakdown in SDG prioritization.

Table 3. SDG prioritization in Ukrainian company sustainability reporting

Sources: Created by the authors.

Company	1st	2nd	3rd
Enselko	SDG 8	SDG 7	SDG 2
Epicentr Agro	SDG 2	SDG 1	SDG 3
Kernel	SDG 2	SDG 16	SDG 8
IMC	SDG 12	SDG 8	SDG 15
KSG Agro	SDG 2	SDG 10	SDG 16
MHP	SDG 2	SDG 13	SDG 7
Ukrprominvest Agro	SDG 2	SDG 8	SDG 1
Astarta	SDG 13	SDG 2	SDG 16
Continental Farmers Group	SDG 1	SDG 2	SDG 3
Ukrlandfarming	SDG 2	SDG 7	SDG 8

For example, SDG 2 (6 companies out of 10) is the first priority for most Ukrainian companies. SDGs 2, 7, and 8 are the most frequently second priorities in their activities.

The strong focus on SDG 12 (7 companies out of 10) and SDG 7 (3 companies out of 10) is proved by the fact that those goals are the first priorities in the Finnish companies' sample.

Table 4. SDG prioritization in Finnish companies' sustainability reporting

Sources: Created by the authors.

Company	1st	2nd	3rd
Apetit	SDG 7	SDG 12	SDG 8
Atria	SDG 7	SDG 8	SDG 12
Fazer	SDG 12	SDG 13	SDG 2
Hkscan	SDG 12	SDG 7	SDG 2
Hätäla	SDG 12	SDG 2	SDG 6
Lantmännen Agro.	SDG 12	SDG 13	SDG 9
Nordzucker	SDG 7	SDG 13	SDG 2
Polarica	SDG 12	SDG 8	SDG 16
Raisio	SDG 12	SDG 13	SDG 7
Valio	SDG 12	SDG 2	SDG 8

The distribution of SDG target indicators for Ukrainian and Finnish companies (Figures 3 and 4) supports the abovementioned statement about extensive type of Ukrainian AFVC.

The highest percentage of keywords is relevant for target 2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers by ensuring equitable access to land, resources, knowledge, financial services, markets, and non-farm employment opportunities. Other relevant targets are 2.1 By 2030, eliminate hunger and ensure that everyone, especially the poor and vulnerable, has access to safe and nutritious food year-round, and

Sources: Created by the authors via JCR SDG Mapper.

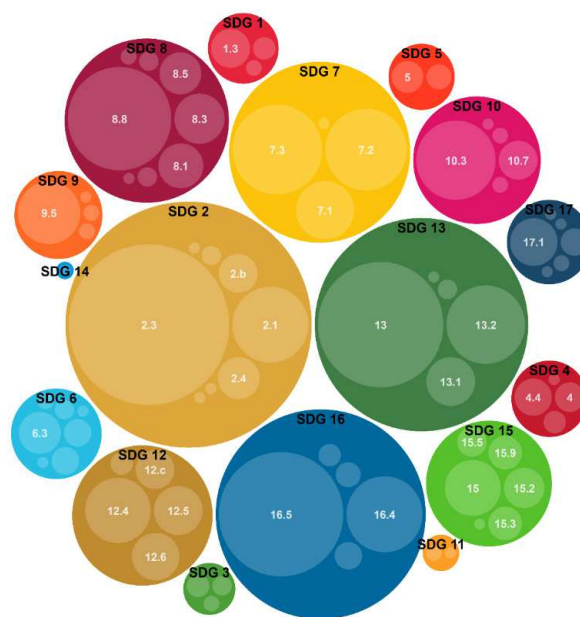


Figure 3. SDG targets detected in Ukrainian company sustainability reporting (percentage of keywords relevant to each goal)

2.4 promote sustainable food production systems and resilient agricultural practices (UN, 2016).

For the second most important SDG 13, in the sample of Ukrainian companies, the most relevant are targets 13.2, Incorporating climate change measures into national policies and planning, and 13.1, enhancing resilience and adaptive capacity to climate-related hazards and natural disasters in all countries. For the third SDG 16, the most important in AFVC practice in Ukraine in current circumstances are targets 16.5 Substantially reduce corruption and bribery in all their forms and 16.4 By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime (UN, 2016).

For Finnish companies, the most relevant targets are circular economy related:

- 12.6 Encourage companies, particularly large and transnational ones, to adopt sustainable practices and include sustainability information in their reporting;
- 12.5 By 2030, significantly reduce waste generation through prevention, reduction, recycling, and reuse;

- 12.3 By 2030, halve global per capita food waste at retail and consumer levels, and reduce food losses in production and supply chains, including post-harvest losses;
- 12.4 By 2020, ensure the environmentally sound management of chemicals and wastes throughout their life cycle, following international frameworks, and significantly reduce their release into air, water, and soil to minimize adverse impacts on health and the environment (UN, 2016).

SDG 7 is the second most important SDG in the Finnish sample with energy efficient and renewable energy oriented targets: 7.3 By 2030, double the global rate of improvement in energy efficiency; 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix. For the third most relevant SDG for Finnish companies, which is SDG 13, 13.2 and 13.1. are the same as for Ukrainians.

3.3. Text mining and qualitative text analytics

While the STI index provides the quantitative measurement of transparency of Finnish and Ukrainian companies, SDG scrapping is the most relevant SDG and its targets in company reporting,

Sources: Created by the authors via JCR SDG Mapper.

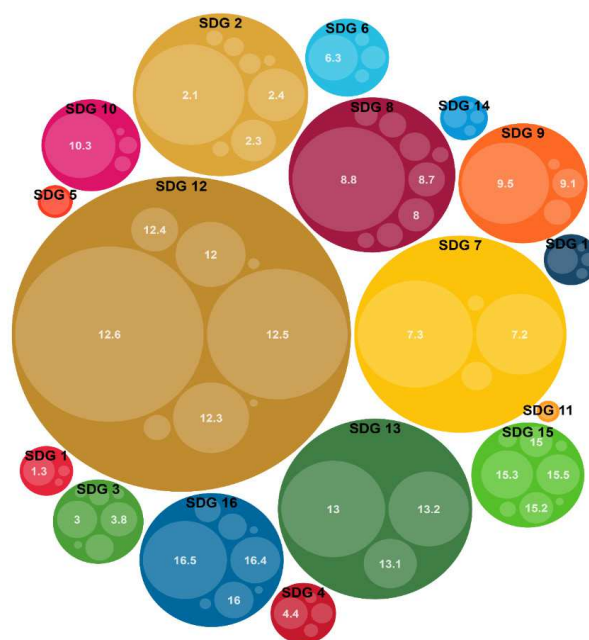


Figure 4. SDG targets detected in Finnish company sustainability reporting (percentage of keywords relevant to each target)

Sources: Created by the authors via Infranodus.

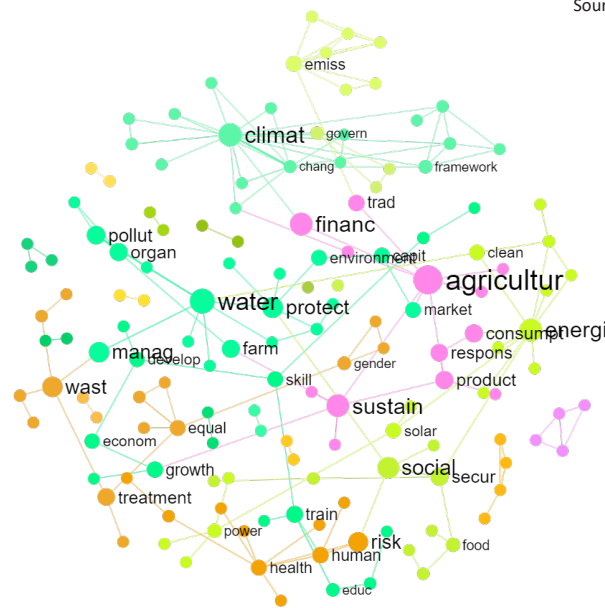


Figure 5. Mind map on Ukrainian company sustainability reporting

Table 5. Topical clusters in Ukrainian company sustainability reporting

Topical Cluster	Influence	Total Nodes	Percentage of Entries	Category
1	0.26	13	0.09	1. Sustainable Agriculture
2	0.25	18	0.12	2. Water Management
3	0.09	13	0.08	3. Economic Growth
4	0.08	14	0.08	4. Waste Management

text mining, and qualitative text analytics, which are intended to highlight main keyword clusters aligned with basic sustainability topics irrespectively to SDG in company reporting.

For Ukrainian companies, 390 keywords from sustainability reports and website information were identified. SDG Mapper and Scanner 2030 text mining opportunities were utilized to create that list of keywords (see relevant figures in each company Appendix). Infranodus opportunities show the main topical cluster, their statistical description and categories.

Figure 5 demonstrates a strong focus of Ukrainian companies on sustainable agriculture (the most significant cluster with 26% of influence).

This cluster is fully compliant with SDG 2, with Ukrainian companies having the highest priority. Other relevant clusters are water and waste management and economic growth (Table 5).

Finnish sample keyword mind map (Figure 6) supports the highest priority of SDG 12. An intensive approach to AFVC development found evidence with efficient agricultural market frameworks and technological innovation introduction in the agri-food sector (Table 6).

The role of AFVC companies in Finland's energy sector is underlined by sustainable energy and industry focus, with the keywords accounting for 17% of the total sample reports.

Table 6. Topical clusters in Finnish companies' sustainability reporting

Topical Cluster	Influence	Total Nodes	Percentage of Entries	Category
1	0.32	14	0.15	1. Water and Waste Management
2	0.17	15	0.11	2. Sustainable Energy and Industry
3	0.16	7	0.6	3. Agricultural Market
4	0.14	10	0.8	4. Technological Innovation

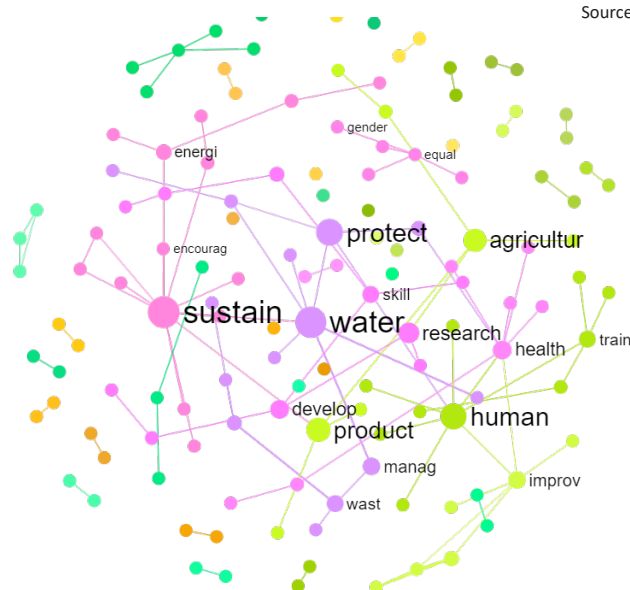


Figure 6. Mind map on Finnish company sustainability reporting

Such keyword clustering results for Finnish companies are entirely in line with Rajic et al. (2022), where the most frequent performance indicators reported by companies were related to water with-

drawal. Moreover, there is an average annual reduction in four major environmental dimensions: water withdrawal, total waste, energy consumption, and GHG emissions.

CONCLUSIONS

This study focuses on examining SDG and ESG criteria as a basis for transparency assessment in a comparative study of agri-food businesses in Finland and Ukraine. The study seeks to enhance STI's conceptual framework and empirical foundations. According to STI calculations, the level of transparency in Finnish companies is higher than that of Ukrainian companies.

Several SDGs (1, 14, and 15) were left behind in AFVC disclosure in both countries. While SDG 2 (Ukraine) and SDG 12 (Finland) are the goals and targets with the highest priority, and SDG 8 is in line with GRI Standard 13, SDG 16 (Ukraine) and SDG 7 (Finland) are added beyond the standard disclosure recommendation.

However, the double materiality assessment of stakeholders' information requests and company activities disclosure was not widely spread in both company samples. Only the Fazer report contains that matrix. It is not aligned with SDG goals and targets, though.

So, there is room for improvement in AFVC sustainability transparency in both countries. Specifically, regulatory recommendations cover better alignment with EU (Finnish) benchmarks, reporting and assurance practices for Ukrainian companies, and incorporation of recent EU sustainability disclosure approaches for Finnish companies.

The efforts to further transpose CSRD, ESRS, and EU Taxonomy are crucial for Finnish companies. Not all companies disclose all necessary information under newly adopted legislation. More disclosure is expected as the bottom line for the 2024 reporting year in 2025.

Finnish experience in providing transparent disclosure about SDG-aligned activities is very valuable for Ukrainian companies, especially with a broad exploration of food safety management and audit schemes, labeling, and certifications (FSSC 22000, IFS, BRC, etc.).

These complicated circumstances caused maritime law to make it very difficult for Ukrainian companies and regulators to implement the EU Directives on sustainable disclosure. However, responsible investment allocation will be crucial for the postwar recovery of Ukrainian AFVC with their strategic EU partner, which requires SDG and ESG alignment and high compliance with EU reporting-related legislation in sustainability.

The recommendations provided are crucial for increasing the sustainability transparency of AFVCs, which will contribute to SDG regulation disclosure and governance improvements in AFVCs in both countries. These measures include qualitative and quantitative measures of sustainability transparency (sustainability transparency index assessment, strong SDG focus), demonstrating how this supports better investment decision-making.

Further research will focus on CSRD and ESRS effect assessment in 2025 after Finnish companies publish their first sustainability reports under new CSRD requirements and after they are obligatorily verified starting in 2026.

AUTHOR CONTRIBUTIONS

Conceptualization: Inna Makarenko.
 Data curation: Kateryna Yuhai.
 Formal analysis: Kateryna Yuhai.
 Funding acquisition: Inna Makarenko.
 Investigation: Bodo Steiner, Kateryna Yuhai.
 Methodology: Inna Makarenko.
 Project administration: Inna Makarenko.
 Resources: Bodo Steiner.
 Software: Inna Makarenko.
 Supervision: Inna Makarenko, Bodo Steiner.
 Validation: Bodo Steiner.
 Visualization: Bodo Steiner, Kateryna Yuhai.
 Writing – original draft: Inna Makarenko, Kateryna Yuhai.
 Writing – review & editing: Bodo Steiner.

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