world

MDPI

Article

Double Materiality in European Water-Sector Companies: Evidence from the First Application of the European Sustainability Reporting Standards

Salvador Marín-Hernández [1,†], Pascual Fernández-Martínez [2,†] and Esther Ortiz-Martínez [1,*,†]

[1] Departamento de Economía Financiera y Contabilidad, Facultad de Economía y Empresa, Campus de Espinardo, Universidad de Murcia, 30100 Murcia, Spain; salvlau@um.es
[2] Departamento de Economía Aplicada e Historia e Instituciones Económicas, Facultad de Ciencias de la Economía y de la Empresa, Campus de Madrid, Universidad Rey Juan Carlos, 28032 Madrid, Spain; pascual.fernandez@urjc.es
* Correspondence: esther@um.es
† These authors contributed equally to this work.

Abstract

The use of European Sustainability Reporting Standards (ESRS) under the Corporate Sustainability Reporting Directive (CSRD) represents a major change in corporate sustainability reporting, particularly through the formalisation of the double materiality principle. Despite its regulatory relevance, empirical evidence on how organisations disclose double materiality remains limited, especially during the first reporting cycle. This study provides early empirical indicative evidence on the application of double materiality in disclosure following the initial ESRS reporting. It examines how leading European water-sector companies and environmental service providers with urban water activities integrated this approach into their 2024 sustainability disclosures. A mixed-methods design is applied, combining qualitative content analysis with descriptive quantitative checks of sustainability, ESG, and integrated reports. The disclosed material topics are assessed against the ESRS thematic framework. The findings indicate a strong convergence on the key environmental issues reported, notably climate change, water management, and circular economy-disclosed practices, including companies not yet fully subject to ESRS requirements. In contrast, social and governance disclosures suggest greater heterogeneity. Overall, the results suggest that broader material coverage does not necessarily imply higher information quality, as this reflects the breadth of disclosure rather than its quality, reinforcing double materiality as a sector-driven prioritisation mechanism.

Keywords: double materiality; CSRD; ESRS; urban water sector; sustainability reporting

Check for updates

Academic Editor: Manfred Max Bergman

Received: 28 April 2026
Revised: 16 June 2026
Accepted: 24 June 2026
Published: 29 June 2026

Copyright: © 2026 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

1. Introduction

The growing relevance of sustainability reporting signals a broader transformation in the role of corporations in society, specifically in sectors that provide essential public services [1,2]. Over the last decade, Environmental, Social, and Governance (ESG) factors have turned from peripheral concerns to core elements of corporate accountability, risk management, and strategy. This transformation is particularly evident in infrastructure and utilities, where corporate actions directly impact environmental integrity, social well-being, and public trust. The provision of essential services, such as water, energy, transport, and waste management, is critical for economic development, sustainability, and social

welfare, enabling public utilities to play an important role in this field [3]. So, there has traditionally been a strong regulatory framework to ensure the provision of these services. Within this field, the water sector is critical, and although it includes a core component of public service provision, organisations providing these services undertake activities such as water supply, wastewater management, and environmental services [4]. The nature of these broad activities is linked to sustainability and transparency requirements, and thus these companies are relevant for studying the early adoption of sustainability reporting frameworks such as the European Sustainability Reporting Standards (ESRS). Therefore, this study focuses on water-sector companies and environmental service providers with significant involvement in urban water activities as a relevant empirical setting for analysing how organisations report on double materiality under the ESRS framework.

The water industry holds a unique position at the intersection of environmental sustainability, social equity, and economic development. Water is essential for life and most economic activities yet faces increasing pressures from climate change disclosure practices, population growth, pollution, and ageing infrastructure. Water scarcity and stress already impact large populations, while floods are the most frequent natural disaster globally, causing significant social and economic losses [5]. Freshwater ecosystems are among the most transformed and endangered, with water pollution driving biodiversity loss. These challenges have made water management central to ESG discussions, positioning firms operating in the urban water sector as a key context for analysing contemporary sustainability reporting practices.

Companies operating in the urban water sector provide services that are typically the responsibility of municipalities, sometimes with the support of regional or national governments. These services can be organised through different governance arrangements, including direct municipal management, public consortia grouping several municipalities, or publicly owned companies. In many cases, private capital is also involved through long-term concessions, mixed public–private partnerships, or fully privately owned firms, some of which are listed on capital markets. These utilities usually manage water treatment plants, water supply distribution networks, sewage systems, and wastewater treatment facilities. Some companies also operate tertiary treatment processes that enable water reuse, as well as specialised distribution networks used for irrigating public parks and other urban purposes. In addition, certain utilities manage reservoirs and water catchment systems. While some of the companies included in this study operate across the entire water service chain, others specialise in specific activities, such as water distribution or wastewater treatment. Nevertheless, all of them operate within the European urban water sector.

In recent years, sustainability information disclosure has evolved from a predominantly voluntary, inconsistent practice to a more standardised, regulated one. Within the European Union, this shift has been formalised through the Corporate Sustainability Reporting Directive (CSRD) [6] and the European Sustainability Reporting Standards (ESRS) [7]. The CSRD seeks to enhance the quantity, quality, comparability, and credibility of companies' sustainability disclosures, thereby facilitating sustainable finance and enabling more informed stakeholder decisions. A key innovation of this regulatory framework is the explicit reporting of the double materiality principle, which obliges companies to assess and report both their impacts on society and the environment (impact materiality), and the sustainability-related risks and opportunities that may influence their financial performance (financial materiality).

More recently, the proposals in the EU's 'omnibus' package have introduced significant new changes to sustainability reporting, with the primary aim of reducing administrative burdens without compromising the CSRD's fundamental objectives. Some of these proposals have already been adopted, including higher applicability thresholds that limit

the obligation to produce sustainability reports to larger companies, thereby reducing the number of companies initially expected to fall within the scope of the Directive. These reforms promote a more proportionate approach to reporting, emphasising the disclosure of essential quantitative information and clarifying the application of materiality concepts in order to improve consistency and reduce complexity. These adjustments are largely a result of lessons learnt. In addition to the general changes, the Omnibus initiative introduces safeguards for smaller entities within corporate value chains, limiting the scope of information that companies subject to the Directive may request from partners with fewer than 1000 employees. This measure aims to mitigate the potentially disproportionate compliance burdens placed on small and medium-sized enterprises.

A more detailed examination of national approaches to double materiality reporting reveals significant heterogeneity across European contexts. The evidence suggests that reporting practices vary notably depending on national regulatory environments, prior experience with non-financial reporting, and institutional traditions [8]. In some cases, reporting practices appear more structured and closely aligned with ESRS requirements, while in others, disclosures remain more descriptive and less standardised. These differences highlight the influence of national frameworks on the way double materiality is reported, particularly in this early stage of ESRS adoption [9].

The urban water sector provides a particularly relevant context for analysing the practical implications of double materiality. From an environmental perspective, climate change is intensifying droughts, desertification processes, and rainfall variability, thereby increasing both physical and transition risks for water utilities. Challenges such as water source pollution, wastewater treatment, and circular water reuse are closely linked to ecosystem health and the long-term availability of water resources [10]. At the same time, the sector has a strong social dimension. Access to safe drinking water and adequate sanitation remains a major global challenge, with billions of people still lacking safely managed water, sanitation, and hygiene services [11]. Inadequate water quality and insufficient wastewater management are closely associated with waterborne diseases and significant public health risks [12,13]. These characteristics make the water sector a case to be analysed and commented on, as environmental and social impacts are intrinsically linked to financial risk, regulatory exposure, and long-term investment requirements.

Governance issues further reinforce the relevance of water companies to corporate sustainability reporting research. Water companies often operate in complex regulatory environments, involving public ownership, concession agreements, or hybrid governance structures. Transparency, adherence to regulatory obligations, ethical behaviour, and accountability have become central governance concerns, closely linked to organisational legitimacy and the preservation of public trust [14]. At the same time, major international sustainability standards and reporting frameworks—such as GRI, SASB, TCFD, and ISSB—have strengthened their requirements for water-related disclosures, signalling heightened expectations for responsible corporate water management and broader ESG performance.

Despite the expanding regulatory landscape and growing scholarly interest, empirical insights into how firms operationalise and execute the double materiality concept remain scarce because of its recent introduction. The academic literature on sustainability and materiality reporting has so far focused on voluntary disclosure systems or on industries where environmental and social externalities are less immediate or pronounced [15,16].

This article analyses how leading European firms operating in the urban water sector reported double materiality in their 2024 sustainability disclosures, following the first ESRS reporting. Using qualitative content analysis, complemented by descriptive quantitative robustness checks, the paper examines the material problems identified by firms, the balance between financial impact and materiality, and the degree of convergence and

heterogeneity among firms. In doing so, the article contributes to the literature on corporate sustainability reporting and business ethics in three ways. First, it provides early empirical indicative evidence on the new ESRS reporting in a critical infrastructure sector. Second, it advances the understanding of sectoral dynamics in dual materiality assessments. Third, it offers us an additional insight into the implications of mandatory sustainability reporting for corporate strategy, regulatory oversight, and stakeholder decision-making. Also, from a theoretical perspective, this study contributes to the literature by providing an integrated explanation of reporting patterns under the ESRS.

It should be noted that the empirical setting analysed in this study is not limited to firms exclusively operating as urban water utilities. The sample also includes large water-sector companies and environmental service providers with significant involvement in urban water activities. This reflects the structural characteristics of the European water sector, where integrated service provision is common.

Therefore, for the development of this article, we have followed the following structure. First, we provide a detailed analysis of the existing literature in order to inform the research questions we have raised. In the following section, we describe the methodology used to answer these questions, followed by the analysis of the results obtained. The last two sections of the article are devoted to a discussion of the results and, finally, the conclusions.

2. Materials and Methods

The concept of materiality has been core to corporate reporting, as there was a need to add relevant information for investors' decisions aside from the financial information [1]. The concept of materiality in sustainability reporting has evolved over time, expanding its scope from its mainly financial orientation to a broader concept to satisfy more stakeholders, including environmental and social issues. This evolution comes from the perception that undertakings have wider consequences that cannot be fully included in financial indicators [2].

At the beginning of the sustainability disclosures, using the most generally accepted framework of the Global Reporting Initiative (GRI), the materiality notion increases to adopt a stakeholder's angle. These accepted frameworks encouraged firms to assess issues that stakeholders and society as a whole considered significant. However, there were also critics of this approach, such as the lack of comparability, its limited clarity, and problems with investors' access to information to make decisions [15]. It also still happens with more recent standards, such as those developed by SASB and the ISSB to weave financial relevance and business value back into the materiality discussion.

Within Europe, this broader concept of materiality is included in the regulation as double materiality. It means that undertakings assess both perspectives: financial and impact materiality. Financial materiality implies an outside-in dimension, assessing the financial risks and opportunities of sustainability in the financial data, and for impact materiality, the inside-out view that assesses the impacts of the undertaking activity on sustainability issues. This double view aims to answer information needs for both stakeholders and investors [7,16]. Although it has been a burning topic in the European regulatory discussion, the previous literature indicates that double materiality assessment is scarce among undertakings [17].

Scholars have identified methodological and practical concerns regarding the double materiality assessment. One of them is the subjectivity of the process for assessing the double materiality and the discretionality that it can introduce, while other authors claim that the materiality assessment can also be symbolically adopted [18,19]. Additionally, the profusion of material issues can diffuse the utility of the reporting [2]. All these

conclusions suggest that materiality is not directly required by regulation but is the result of undertakings' governance and strategy priorities.

Previous studies on sustainability reporting practices are based on institutional theory, which establishes that coercive, normative, and mimetic pressures shape organisational behaviour [20]. Compulsory frameworks such as the CSRD oblige the adoption of more consistent reporting practices to increase the comparability of disclosure [16,21,22].

Research in this field has shown that regulatory convergence does not mean organisational change. In particular, in the first reporting, undertakings do so to respond to the obligations, disclosing to meet the requirements but without internal real implementation [19,23]. On the other hand, if there is an assessment of double materiality, it seems complex and requires the involvement of the organisation and its value chain, and so it is integrated in the undertaking.

The features of sustainability information disclosed are determined by stakeholders' expectations, as are its type and extent, following the Stakeholder Theory [24]. Also, the sector determines the disclosure, as is the case with more publicly exposed sectors or sectors related to public welfare, for which reporting is more required by stakeholders [14]. Therefore, materiality assessments can be used as a tool to negotiate their legitimacy and show their responsiveness to stakeholders.

The Signalling Theory is also applicable in this case, as it suggests that undertakings disclose further information as a signal of higher managerial quality, more robust risk awareness, or a clearer long-term strategic horizon [25,26]. The profusion of sustainability reporting reduces information asymmetry, thereby reducing the financial costs and improving access to financial resources [27–29]. These mechanisms are more relevant in capital-intensive industries like utilities, where investment horizons are long and sensitive to sustainability-related risks.

Therefore, undertakings operating in sectors with a larger environmental footprint, such as utilities and infrastructure, are most commonly researched, also due to their specific regulation and public importance. Some authors specifically conclude that, as utilities provide essential services and operate with key natural resources, they are assumed to show higher levels of accountability [14,30]. Hence, utilities disclosure often highlights issues such as legitimacy maintenance, risk oversight, and regulatory requirements compliance.

Concretely, within utilities, the urban water sector is particularly relevant for assessing double materiality as water utilities are exposed to a wide range of environmental risks—climate change, water scarcity, pollution, and the progressive degradation of aquatic ecosystems—while simultaneously carrying the responsibilities of public health, service reliability, and social equity [10,13]. These interrelated responsibilities result in a situation in which both materialities frequently overlap (financial and material materiality). The close relationship between the two angles of materiality in the urban water sector can easily be associated with reputational problems or financial losses from environmental or social failures.

In the water sector, research on ESG issues points to the increasing importance of practices such as corporate water stewardship, circular resource approaches, and integrated water resource management [10]. Although there is a need for empirical research into the identification and prioritization of water utilities' sustainability material topics, the literature is mainly focused on disclosure extent and performance indicators rather than on the materiality assessment process, particularly in a compulsory reporting context.

There are three gaps to bridge in the background. First, there is a lack of empirical literature on how undertakings assess their materiality, regardless of the current regulatory environment and policy discussions. Second, is the need to also study compulsory landscapes, as most studies are centred on voluntary disclosure. Third, the sector is a variable

that affects materiality, especially in water utilities, and there is a need for sectoral analyses that account for sector-specific idiosyncrasies such as critical water infrastructures.

This study seeks to provide indicative evidence to this debate and, therefore, addresses these shortcomings by providing a first empirical analysis of double materiality disclosures in the main European water companies after the first application of the ESRS. By combining qualitative content analysis with robust quantitative descriptive checks, the article contributes to the literature on corporate sustainability reporting by analysing sector-specific patterns, heterogeneity between firms, and the early implications of mandatory double materiality reporting. To do this, we address the following research questions:

- RQ1: How is the first application of the ESRS associated with how European firms operating in the urban water sector conceptualise and disclose material sustainability issues?
- RQ2: To what extent is the first application of the ESRS associated with the emergence of a hierarchy among material sustainability topics in these utilities?
- RQ3: How are material disclosures distributed across ESG pillars in the first ESRS application in these utilities?

To summarise this research approach, Figure 1 presents the conceptual framework that has guided our study. It illustrates how the initial application of the ESRS is related to the identification and disclosure of material sustainability issues through the double materiality process. Hence, in this study, we analyse the conceptualisation of material issues within the water utilities sector, the hierarchy of topics, and how disclosures are distributed within the ESG pillars.

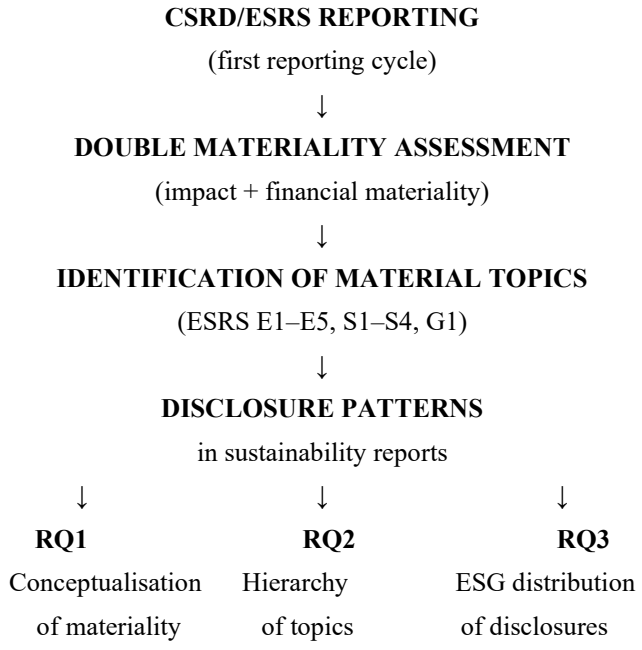

Figure 1. Conceptual framework. Source: own elaboration.

To study the operationalisation of double materiality in the first reporting cycle of leading European firms operating in the urban water sector, we use a qualitative methodology based on content analysis, as this is necessary to conduct document-based research. To provide a clearer understanding of the analytical framework, Figure 2 illustrates the process of double materiality reporting as reflected in the analysed disclosures. The process begins with the identification of relevant sustainability topics, followed by the assessment of impacts, risks, and opportunities. Based on this evaluation, organisations determine which topics are considered material under the double materiality approach. Finally, these

material topics are disclosed in sustainability reports. It is important to note that Figure 2 reflects reported processes based on publicly available disclosures, rather than verified internal procedures.

Figure 2. Process of double materiality reporting in water-sector companies. Source: own elaboration.

The analysis departs from the approval of the ESRS within the framework of the CSRD. This empirical process includes (i) a structured mapping of disclosed material topics following the ESRS body; and (ii) a systematic study of narratives, risk/opportunity framing, and governance arrangements embedded in the double materiality assessment.

To create the sample, we have added three layers of criteria. Firstly, the companies must be relevant from an economic and operational perspective in the European urban water sector. This relevance is measured by revenue, population served and international footprint. Secondly, they must have publicly available sustainability disclosures for the 2024 fiscal year. Thirdly, they must have explicitly applied the double materiality approach, either through the application of ESRS/CSRD or aligning voluntarily with ESRS principles.

To improve analytical clarity, the sample is classified into three groups according to the degree of report alignment with ESRS and double materiality:

(i) Explicit reporting: firms that formally apply ESRS and disclose a structured double materiality assessment;

(ii) Partial or transitional reporting: firms that explicitly refer to ESRS principles or double materiality concepts but do not fully report all ESRS requirements;

(iii) Implicit reporting: firms that do not explicitly reference ESRS but present disclosure structures, topics, or reporting logics consistent with double materiality principles.

This classification allows us to capture the diversity of reported practices observed during the early stages of ESRS reporting. The inclusion of firms with partial or implicit reporting is intentional and reflects the transitional nature of the first ESRS reporting cycle. Excluding such cases would restrict the analysis to fully compliant firms and overlook relevant early stage reported practices, thereby limiting the understanding of how double materiality is operationalised in real-world contexts.

It is worth noting that being included in the sample does not depend only on formal compliance with the European regulation, as several companies voluntarily use the ESRS framework and apply the double materiality assessment to address their ESG issues. This is the case of several Spanish firms operating in the urban water sector, which explicitly use the ESRS double materiality procedure to analyse their impacts, risks, and opportunities in their 2024 sustainability reporting regardless of local requirements, as the ESRS serves as a valid body of standards for benchmarking. It means ensuring conceptual comparability between companies that are CSRD-scoped.

It should be noted that the sample is not restricted to firms that exclusively operate as urban water utilities. It also includes large water-sector companies and environmental service providers with significant involvement in urban water activities. This broader scope reflects the structure of the European water sector, where integrated service provision is

common. The unit of analysis in this study is defined at the company topic level. As a result, multiple observations are derived from the same firm, which may introduce dependence among observations within each company.

To compile the information for the sample, we have looked for the most authoritative publicly available sustainability disclosure for fiscal year 2024 (FY2024) for each company (Table 1 includes the primary public sustainability information analysed for each undertaking). We have given priority to documents that explicitly discuss materiality, risk, and impact assessment, and that report alignments with the CSRD and the ESRS, and also to statutory or integrated disclosures—such as Universal Registration Documents or integrated annual reports—due to their governance relevance and proximity to financial reporting. When it is necessary to complement these documents, we have added more specific topic issues from the sustainability or ESG reports. Hence, the main documents analysed are not always the same, as they depend on the issuer's reporting architecture, but they are: sustainability reports, ESG reports, sustainability statements/progress reports, annual integrated reports, and Universal Registration Documents (URDs).

Table 1. The companies.

No.	Company	Country	Main Sustainability Disclosure (FY2024)	Document Type	ESRS/Double Materiality Indicative Evidence
1	Veolia	France	Universal Registration Document 2024; ESG Report 2024	URD + ESG Report	Explicit ESRS report alignment; formal double materiality assessment
2	Grundfos	Denmark	Sustainability Report 2024	Sustainability Report	Explicit double materiality assessment; CSRD/ESRS preparatory report alignment
3	Suez	France	Sustainability Statement 2024; Sustainable Development Progress Report 2024	Sustainability Statement + Progress Report	Explicit ESRS-based double materiality (IROs)
4	Severn Trent	United Kingdom	Sustainability Report 2024	Sustainability Report	Explicit double materiality assessment (voluntary)
5	Thames Water	United Kingdom	Sustainability Report and ESG Statement 2023/24	Sustainability/ESG Report	Impact and risk-based materiality; partial ESRS consistency
6	United Utilities	United Kingdom	Sustainability Report 2024	Sustainability Report	Explicit double materiality logic (impact + enterprise value)
7	Remondis	Germany	Sustainability documentation (corporate website; certificates)	Sustainability disclosures (non-integrated)	Impact-focused disclosure; ESRS transition pending
8	Saur	France	Rapport de Responsabilité Sociétale 2024	Sustainability/CSR Report	Explicit double materiality analysis; CSRD-aligned
9	Anglian Water	United Kingdom	Annual Integrated Report 2024; Sustainable Finance Impact Report 2024	Integrated Report + Impact Report	Explicit double materiality assessment (voluntary)
10	Aqualia	Spain	Informe de Sostenibilidad 2024	Sustainability Report	Explicit ESRS-based double materiality matrix
11	Acea	Italy	Integrated Sustainability Reporting 2024 (within annual reporting)	Integrated Sustainability Disclosure	Double materiality embedded in ESG governance
12	Yorkshire Water	United Kingdom	Annual Report 2024; Our Contribution to Yorkshire 2024	Integrated/Value Report	Integrated impact–value perspective; implicit double materiality
13	Canal de Isabel II	Spain	Informe de Sostenibilidad 2024	Sustainability/EINF	Transition to ESRS; explicit reference to double materiality

Note: here, we summarise the companies included in the sample, their country of origin, the main sustainability disclosure analysed for fiscal year 2024, and the nature of the evidence regarding ESRS report alignment and double materiality application. Source: own elaboration based on Global Water Intelligent (July 2025): "Who are the world's top 50 water businesses?" Note: the sample includes both urban water utilities and broader water-sector and environmental service companies with significant involvement in urban water activities.

Hence, in the case that there are different relevant documents for the same company, we use the following criteria to analyse them:

- For the first stage, their annual report/URD or equivalent statutory filing, including sustainability disclosures (when available), as they are the basis of the governance and

audit/assurance and are vital in the firm's most comprehensive disclosure package (e.g., Veolia's URD).

- Then, a standalone ESG/sustainability report for FY2024 (or FY2023/24 when two calendar years are included in the reporting), as they include detailed topical disclosures and materiality outputs (e.g., Veolia ESG report).
- Finally, supplementary public documents (e.g., sustainability progress reports, sustainable finance impact reports), regarding the additional indicative evidence on materiality governance or stakeholder engagement processes that they include (e.g., Anglian Water).

These criteria are established based on common reporting practices among utilities as they distribute their sustainability information in different documents.

To ensure analytical comparability, documents were included if they met at least one of the following criteria:

* Explicit reference to double materiality (impact materiality and/or financial materiality), materiality matrices, or a double materiality assessment process (e.g., Grundfos; Severn Trent; United Utilities).

* Explicit report alignment or preparatory alignment with CSRD/ESRS reporting requirements, including mapping of topics, IROs (impacts, risks, and opportunities), or ESRS-style topical structuring (common in FY2024 reports prepared ahead of phased CSRD implementation).

* Disclosure architectures consistent with ESRS logic (e.g., governance of sustainability, strategy, policies, targets, metrics, due diligence), even when ESRS terminology is not uniformly applied.

* Where a FY2024 document was unavailable or insufficiently material, we triangulated using other official public sources (issuer sustainability pages, annual reporting portals, and investor/public affairs repositories). We recorded this as a data limitation.

A structured codebook was developed directly from the ESRS architecture to operationalise the concept of double materiality. Coding captured:

(A) ESRS topical coverage

* Environmental standards (E1–E5): climate change; pollution; water and marine resources; biodiversity and ecosystems; resource use and circular economy.

* Social standards (S1–S4): own workforce; workers in the value chain; affected communities; consumers and end-users.

* Governance (G1): business conduct (ethics, compliance, anti-corruption, transparency).

(B) The double materiality dimensions. Each disclosed material topic was coded to determine if it was framed as follows:

* Impact materiality (actual/potential positive or negative impacts on people/environment);

* Financial materiality (risks and opportunities affecting enterprise value);

* Both (explicitly double material; or

* Unspecified/ambiguous.

(C) Process and governance indicators.

* We coded indicative evidence of the following: stakeholder engagement, assessment methods (matrices/scoring), time horizon, value-chain boundary, governance oversight (board/committee), and linkage to strategy and capital allocation.

A detailed ESRS-based coding matrix, including operational definitions and coding rules, is provided as Supplementary Material to enhance transparency and replicability (Section S1). The unit of analysis in this study is defined at the company topic level. As a result, multiple observations are derived from the same firm, which may introduce dependence among observations within each company.

To enhance methodological transparency, the coding process followed a structured and iterative approach. The coding of the sustainability disclosures was performed independently by two researchers with expertise in sustainability reporting and content analysis.

An initial pilot coding phase was conducted on a sub-sample of documents in order to refine the ESRS-based codebook, clarify coding rules, and ensure a shared understanding of the classification criteria. This preliminary phase allowed for the identification of ambiguous cases and the adjustment of decision rules.

Following this stage, the full sample was analysed. Coding discrepancies were systematically identified and discussed between the researchers. All disagreements were resolved through consensus, ensuring a consistent interpretation of the coding categories. In cases of persistent ambiguity, the coding framework was refined to improve clarity and replicability.

To ensure robustness, consistency checks were conducted throughout the coding process, including cross-referencing coded segments and validating keyword-based searches used to trace relevant disclosures. While formal intercoder reliability coefficients were not the primary focus of the analysis, the iterative validation process ensured a high level of coding consistency and interpretative coherence.

The analysis followed two sequential stages:

- Stage 1: Structured ESRS mapping (descriptive–comparative). We extracted and harmonised each company's material topics and mapped them onto ESRS categories to identify convergences and divergences across the sample (e.g., there was a recurring emphasis on climate adaptation and water resource management).
- Stage 2: Interpretive qualitative analysis (explanatory). We conducted an in-depth reading of the narrative sections to assess how firms justify material topics, articulate impact/financial pathways, and link materiality outcomes to report strategy, governance, and performance indicators. Particular attention was given to contested or heterogeneous areas (e.g., biodiversity, just transition, and governance-related disclosures), where prior research suggests lower comparability across firms and jurisdictions.

We have also run a pre-test coding on a sub-sample of the analysed documents to ensure reliability. It has also allowed us to tune the ESRS codebook to clarify the decision-making rules when distinguishing between impact and financial materiality. Consistency checks were done using targeted keyword searches (e.g., "double materiality", "ESRS", "CSRD", "IRO", "impact", "risk", "opportunity") across documents to validate the traceability of coded claims (e.g., explicit references in company reports and governance pages). Finally, documentation of ambiguous cases where companies disclose a topic as "material" without specifying the materiality lens are reported transparently as a limitation.

For the other side, to provide a replicable quantitative complement to the qualitative content analysis, we computed frequency-based indicators at the ESRS-topic level. Following common mixed-methods practices in sustainability reporting research, we transformed the ESRS mapping results into binary topic–company observations (1 = disclosed as material; 0 = not disclosed) and calculated disclosure rates by ESRS topic and ESG pillar (Environmental, Social, and Governance). This codification is consistent with the CSRD's goal, ensuring the consistency and comparability of sustainability reporting by reinforcing the reliability of the qualitative information. Hence, the dummy code, by assigning two values, allows us to ensure analytical transparency and replicability and to further study disclosure by ESG topics and pillars.

We also ran a non-parametric Mann–Whitney U test to assess whether disclosure patterns change between environmental and non-environmental issues (coded 1 for material and 0 for non-material topics). This test allows us to compare the distributions across two different groups of topics: environmental (E1–E5) and non-environmental (S1–S4 and G1).

Hence, it is useful to determine whether, in the first stage of the ESRS reporting process, environmental topics are more frequently included in disclosures.

Finally, we also ran a Pearson chi-square test to determine whether disclosure rates are not related to ESG pillars or, conversely, if there is a relationship within each ESG pillar. Given this structure, the assumption of independence across observations may not be fully satisfied. Therefore, the statistical analyses should be interpreted with caution. This relationship is not causal, as it only suggests that the material topic disclosures are homogeneously distributed in the ESG dimensions in this first stage of ESRS reporting.

3. Results

The quantitative analyses presented in this section are intended as descriptive robustness checks. Given the potential dependence of observations within firms, these tests are used to identify patterns in the data rather than to establish formal statistical inference.

The results indicate that the first application of the ESRS—either through full compliance or through the voluntary reporting of the double materiality approach—is clearly associated with how European firms operating in the urban water sector conceptualise and disclose material sustainability issues.

The analysis indicates strong convergence among European firms operating in the urban water sector on core environmental double materiality issues following the first application of the ESRS framework. All the companies in the sample (13/13) have considered reporting the topics of climate change mitigation and adaptation (ESRS E1) and water and marine resources (ESRS E3) (Table 2). These topics are determined using the double materiality perspective, including impacts, risks, and opportunities. In some cases, firms explicitly integrate both impact and financial perspectives, illustrating a double materiality approach. For example, water resource management is often presented as a topic that simultaneously affects ecosystems and communities while also posing financial risks related to resource scarcity, infrastructure adaptation, and regulatory compliance. This combined framing reflects the dual perspective promoted by the ESRS framework.

Table 2. Results of the materiality analysis.

ESRS Category	Specific ESRS Topic	No. of Companies Disclosing as Material (n = 13)	Dominant Materiality Dimension
E1	Climate change mitigation	13/13	Double materiality (impact + financial)
E1	Climate change adaptation	13/13	Double materiality
E2	Pollution (water, soil, air)	11/13	Impact materiality dominant
E3	Water and marine resources	13/13	Double materiality
E4	Biodiversity and ecosystems	8/13	Impact materiality dominant
E5	Resource use and circular economy	12/13	Double materiality
S1	Own workforce (health, safety, skills)	12/13	Double materiality
S2	Workers in the value chain	7/13	Impact materiality
S3	Affected communities	10/13	Impact materiality
S4	Consumers and end-users	9/13	Double materiality
G1	Business conduct and ethics	11/13	Financial materiality dominant

Source: own elaboration.

These results are useful for answering RQ1, as they suggest that European water supply companies disclose their relevant sustainability issues in patterns consistent with the ESRS framework.

This trend is similar to the results reported in the literature, which suggest an association between compulsory sustainability reporting frameworks and more standardised and comparable corporate reporting and, at the same time, improve the convergence of reporting frameworks [16,22].

When companies disclose on climate (Tables 3 and 4), they highlight the sector's contributions to climate mitigation and its exposure to climate-related risks, specifically

physical risks that affect the resilience of their infrastructure and water availability. Water resource management appears as a material issue that suggests the relationship between environmental impact materiality and the company value in the urban water sector in the long term. According to these results, companies operating in this sector frame environmental issues as linked to ecosystems, communities, and financial performance.

Table 3. Frequency of ESRS topics disclosed as material.

ESRS	Topic	Companies (Count)	Disclosure Rate (%)
E1	Climate change mitigation	13	100.0
E1	Climate change adaptation	13	100.0
E2	Pollution	11	84.6
E3	Water and marine resources	13	100.0
E4	Biodiversity and ecosystems	8	61.5
E5	Resource use and circular economy	12	92.3
S1	Own workforce	12	92.3
S2	Workers in the value chain	7	53.8
S3	Affected communities	10	76.9
S4	Consumers and end-users	9	69.2
G1	Business conduct	11	84.6

Note: topics are classified as material based on explicit statements, materiality matrices, or narrative justification referring to impacts, risks, or opportunities. Source: own elaboration.

Table 4. Disclosure intensity by ESG pillar.

ESG Pillar	ESRS Topics Included	Possible Observations (Topics × 13)	Material Disclosures (Count)	Disclosure Intensity (%)
Environmental (E1–E5)	6	78	70	89.7
Social (S1–S4)	4	52	38	73.1
Governance (G1)	1	13	11	84.6
Total	11	143	119	83.2

Note: The ESRS breadth index captures the scope of ESRS topical standards identified as material by each company. It reflects coverage rather than depth or quality of disclosure. Source: own elaboration.

Regarding resource use and the circular economy (ESRS E5), the topics are mainly considered material (12 out of 13 companies), articulated as a double material issue. In their disclosures, companies and firms operating in the urban water sector point out that they are improving efficiency, wastewater reuse, energy recovery, and circular processes. In this sense, companies are taking advantage of environmental reporting issues to differentiate themselves from competitors.

For pollution (ESRS E2) and biodiversity and ecosystems (ESRS E4), the results are heterogeneous. Most companies assess material pollution-related topics (11 out of 13), while biodiversity and ecosystem impacts are the least frequently included in environmental issues (8 out of 13). Pollution is first considered material from the angle of impact, with only limited financial implications. Biodiversity and ecosystems depend on companies' assessment and communication of their ecological dependencies and impacts.

This pattern is illustrated in company disclosures that emphasise impact materiality. For example, several firms frame pollution-related topics in terms of their environmental and social consequences, highlighting their effects on ecosystems and communities. Typical disclosures refer to water pollution management as a key issue due to its potential to affect biodiversity, public health, and local environmental conditions, without explicitly linking these impacts to financial outcomes.

When materiality is referred to social aspects of sustainability (Table 3), the trend differs from the environmental issues. A dual materiality perspective is found in own workforce issues (ESRS S1) by most companies (12 out of 13). This double materiality encompasses occupational health and safety, skill development, and workforce retention, while accounting for productivity and operational continuity.

Affected communities are territorially embedded in the nature of water utilities, and so they suffer their effects directly, as suggested in the 10 companies that identify affected communities as a material topic (ESRS S3). These issues are mainly assessed as material from the perspective of impact materiality, and only reputational effects are discussed in the case of financial risks and opportunities.

Disclosure convergence decreases further for workers in the value chain (ESRS S2), which is identified as material by only seven companies, as well as for consumers and end-users (ESRS S4), which is disclosed by nine companies. Consumer-related issues are more frequently linked to financial materiality through affordability, service quality, and regulatory compliance. Overall, social materiality disclosures are more fragmented and less consistently articulated through a double materiality logic than environmental topics.

Governance-related disclosures, captured under ESRS G1 (business conduct), are identified as material by 11 out of 13 companies. The assessment of this materiality indicates that the topics are material from the financial side. The companies highlight ways to ensure undertakings' value and regulatory report alignment, such as highlighting their compliance risks, ethical conduct, anti-corruption measures, and governance controls.

Lastly, the governance topics differ from environmental ones in two main aspects, although they are generally considered material. The first difference in the governance materiality comes from the less frequent relationship with broader societal or environmental impacts. The second is that these disclosures better highlight policies and controls than outcome-oriented indicators or impact pathways. This last difference is associated with this first stage of ESRS reporting; the materiality of governance topics is mainly considered as a risk management and compliance function rather than as a part of the integrated impact–value creation.

By contrast, financial materiality is often reflected in the way companies describe sustainability-related risks and opportunities. For instance, climate change disclosed practices are frequently framed in terms of its financial implications, such as its effects on infrastructure resilience, operational costs, and long-term investment requirements. In these cases, disclosures focus on risk exposure, regulatory compliance, and financial performance rather than broader societal impacts.

The results suggest a hierarchy of material topics within all the companies in the sample. The most important level of convergence lies in environmental issues related to climate and water resources. Also, the most important integration of both materiality, impact and financial, is found in these same topics. Social issues exhibit moderate convergence but are more often framed solely in terms of impact materiality. Governance issues suggest high recognition but are predominantly articulated in financial and compliance-oriented terms.

These results provide indicative evidence relevant to RQ2, suggesting the presence of a hierarchy of important sustainability issues observed under the first ESRS application within the urban water sector. Our results suggest that undertakings tend to prioritise environmental disclosed issues, concretely climate change and water resource management. This trend aligns with previous studies that have found a clear pattern between sector features and the ESG topics prioritised in sustainability reporting [15,31].

Hence, this first year of ESRS application indicates an emerging report alignment on double materiality caused by differences in the ESRS categories or sustainability topics.

The quantitative robustness checks further support these patterns. An overview of the quantitative robustness checks, including the data structure, coding, and statistical tests applied, is provided in Table 5. ESRS topics were assessed for all companies irrespective of whether they were formally required to apply the full set of ESRS. This was done to capture substantive reporting of double materiality during the transition phase.

Table 5. Overview of quantitative robustness checks.

Component	Description
Data source	ESRS topic-level coding derived from sustainability, ESG and integrated reports (FY2024)
Unit of analysis	Company–ESRS topic observation
Coding scheme	Binary variable (1 = topic identified as material; 0 = not identified as material)
Total observations	143 (11 ESRS topics × 13 companies)
ESG pillars	Environmental (E1–E5), Social (S1–S4), Governance (G1)
Descriptive indicators	Frequency counts and disclosure rates by ESRS topic and ESG pillar
Statistical test	Pearson chi-square test of independence
Null hypothesis (H_0)	Disclosure status is independent of ESG pillar
Effect size	Cramér's V
Purpose	Robustness check to support qualitative content analysis

Source: own elaboration.

Pearson chi-square statistics are reported as a descriptive reference. While differences across groups can be observed, these results should be interpreted as indicative patterns rather than as evidence of statistically robust relationships. Pearson chi-square test indicated an observable pattern between disclosure status (material vs. not material) and ESG pillar ($\chi^2(2) = 6.23$, $p = 0.044$), with a small-to-moderate effect size (Cramér's V = 0.21). Consistent frequency patterns by ESRS topic and ESG pillar are reported in Tables 3 and 5. This result suggests that, in the first ESRS reporting cycle, material disclosures were not evenly distributed across ESG pillars, with environmental topics suggesting the highest disclosure intensity.

Taken together, the results support RQ3, suggesting that material disclosures are unevenly distributed across ESG pillars. Hence, in the urban water sector, most disclosed environmental issues are found, which is similar to previous studies that obtained that sector features are associated with the relative importance of ESG topics prioritised in sustainability reporting [16,31].

Finally, to further explore the observed ESG asymmetry, we aggregated Environmental ESRS topics (E1–E5) and compared them against non-environmental topics (Social S1–S4 and Governance G1). Environmental topics suggest a notably higher disclosure intensity (89.7%) compared to non-environmental topics (75.4%).

A non-parametric Mann–Whitney U test suggests that this difference is an observable pattern (U = 2046, $p = 0.029$), indicating that environmental topics are systematically prioritised in the first ESRS reporting cycle (Table 6).

Table 6. Environmental vs non-environmental disclosure comparison.

Category	Possible obs.	Material	Intensity (%)
Environmental	78	70	89.7
Non-environmental	65	49	75.4
Mann–Whitney U		U = 2046; $p = 0.029$	

Source: own elaboration.

These findings reinforce the sector-specific salience of environmental materiality in firms operating in the urban water sector and support prior indicative evidence that industry characteristics shape the distribution of material sustainability disclosures.

4. Discussion

This study provides insights into the early stages of ESRS-based double materiality sustainability reporting among water-sector companies. The answers to the previous research questions indicate primarily that ESRS adoption is associated with how companies conceptualise, structure, and disclose sustainability information (RQ1). Disclosures are organised according to ESRS categories, and companies explicitly adopt a double materiality

approach when they are reporting. The main sustainability topics disclosed are climate change and water resource management, which are systematically prioritised (RQ2). Hence, environmental issues are more emphasised as disclosures are unevenly distributed across ESG pillars (RQ3).

These results should be interpreted with reporting practices in mind, as the analysis is based on publicly available information on companies' sustainability reporting. Hence, the findings provide evidence of alignment with ESRS requirements at the reporting level.

Beyond these descriptive findings, the results generate broader theoretical questions regarding the role of ESRS in shaping sustainability reporting. According to the Institutional Theory [20], the convergence observed in disclosures can be understood as a compliance-oriented response to regulatory pressures aimed at enhancing legitimacy and comparability. The previous literature suggests that mandatory sustainability reporting can lead to isomorphic patterns and standardised disclosures, which may not necessarily enhance the usefulness of decisions [16,18,19]. Bearing this in mind, results suggest that, in the early stages of ESRS implementation, convergence primarily operates at the level of disclosure practices. Also, the findings contribute to the discussion on the double materiality needed for sustainability reporting. This assessment is intended to identify and prioritise ESG issues and to formalise reporting processes. Nevertheless, the uneven distribution of disclosures across ESG topics suggests that double materiality currently functions predominantly as a reporting framework. Specifically, social issues—such as labour conditions in the value chain or consumer vulnerability—are more frequently addressed from an impact materiality perspective and are less consistently linked to financial materiality, reflecting the difficulty of quantifying social dimensions [1,2]. However, governance disclosures are more closely associated with financial materiality because they are more closely tied to risk and compliance considerations. These patterns indicate that the articulation of double materiality remains uneven across ESG pillars within reporting practices. Additionally, the results point out the importance of sectoral features in shaping disclosure patterns and materiality outcomes. In the water sector, material topics are predominantly related to water resource management, pollution control, and climate adaptation, reflecting the sector's strong environmental orientation [15,31]. Environmental and social dimensions are closely interconnected, as water-related activities affect public health, ecosystems, and social equity. This helps explain the prominence of environmental disclosures, which can be interpreted not only as an effect of regulatory requirements but also as a reflection of sector-specific characteristics. In this context, water-sector companies are subject to close scrutiny from regulators, municipalities, citizens, and financial actors, reinforcing the relevance of transparency and accountability [14,24,30].

Regardless of the observed convergence, there is heterogeneity in reporting across companies. This can be explained through a combined theoretical perspective integrating Institutional, Stakeholder, and Signalling theories. Differences in disclosures may reflect variations in institutional environments across Member States [8,32,33]. At the same time, companies are subject to different stakeholder pressures that influence disclosure practices [34,35]. And, from a signalling perspective, ESRS-aligned disclosures can serve to demonstrate commitment to sustainability and transparency, thereby reducing information asymmetry [25,26,33,36]. In this way, reporting practices may simultaneously fulfil compliance, legitimacy, and communication functions.

From a financial materiality perspective, the emphasis on climate risks, infrastructure resilience, and regulatory compliance reinforces the role of disclosures in communicating exposure to long-term risks and opportunities. This is consistent with evidence suggesting a relationship between sustainability reporting and access to sustainable finance [27,28]. In this context, double materiality can help align sustainability disclosures with finan-

cial information, particularly when considered alongside broader European sustainable finance frameworks.

The findings should also be interpreted in light of the sample's heterogeneous composition, which includes different types of water-sector companies operating across environmental and infrastructure-related activities, as well as firms at different stages of ESRS adoption. This diversity reflects the structure of the sector and may influence the observed reporting patterns.

Finally, these results should be understood within the broader evolution of European sustainability reporting. The transition from the Non-Financial Reporting Directive (NFRD) to the CSRD, together with the introduction of the ESRS, reflects a shift toward greater harmonisation, comparability, and rigour in sustainability disclosures [37,38]. However, the persistence of heterogeneous reporting practices highlights the transitional nature of the current reporting landscape and the time required for reporting standardisation to consolidate [8,39–41].

Taken together, these findings suggest that ESRS-driven convergence should be understood as a gradual process of alignment in reporting practices, in which standardisation, sectoral specificity, and disclosure-related considerations coexist. While significant progress has been made in structuring sustainability disclosures, further development is needed to achieve a more balanced integration across ESG dimensions within the reporting framework.

5. Conclusions

This study offers initial empirical insights into how prominent European water utilities are beginning to apply the principle of double materiality, following the first-year ESRS reporting under the CSRD. By examining a sector that combines critical infrastructure with pronounced environmental and social relevance, the article engages directly with ongoing scholarly and policy discussions concerning the actual effectiveness, comparability and strategic significance of mandatory sustainability reporting across Europe.

The results point to a strong clustering around core environmental reported themes—especially climate change, water resource management, and circular economy practices. These topics are consistently identified as material and are often approached from both sides of the double materiality perspective. This pattern appears to reflect not only the sector's inherent exposure to environmental issues, but also the structuring potential association with the ESRS framework, which seems to be guiding disclosure practices in a relatively coherent direction [16,20]. At the same time, the findings also indicate notable differences among companies in how they address social and governance topics, as well as variation in the number of ESRS themes considered material. Quantitative comparisons suggest that environmental issues tend to be prioritised, and that firms using integrated or statutory reporting formats tend to report a broader set of ESRS topics.

However, the study also emphasises that a wider range of material topics does not necessarily imply higher reporting quality, as no direct indicator of disclosure quality is employed in this study.

Double materiality is fundamentally about prioritisation, and an overly long list of "material" issues can blur the analytical focus and reduce the usefulness of sustainability reports [2,23]. In this sense, materiality outcomes are not value-neutral, as prioritisation choices may shape which impacts are rendered visible, addressed, or, conversely, marginalised in corporate accountability practices. Some degree of variation between firms is therefore both expected and appropriate, since materiality assessments should reflect differences in business models, geographical exposure, operational complexity, and stakeholder relationships. What ultimately matters is not the quantity of issues identified,

but the transparency, justification, and strategic relevance of those determinations. Given the cross-sectional nature of the data, the findings should be interpreted as associative rather than causal.

From a theoretical perspective, the findings extend prior research in sustainability accounting and corporate responsibility by suggesting how institutional pressures, stakeholder dynamics, and sector-specific features intersect to influence materiality outcomes within a new mandatory reporting environment [20,24,26]. The evidence suggests that, at this early stage, ESRS reporting reflects a tension between compliance-driven behaviour and deeper strategic integration, which has implications for theories of isomorphism, stakeholder legitimacy, and signalling in sustainability reporting. Accordingly, this study contributes by providing early descriptive evidence on the application of double materiality in urban water utilities under the ESRS framework. Hence, the theoretical perspective of the findings suggests that reporting heterogeneity is driven by a complex interplay among institutional contexts, stakeholder pressures, and firms' signalling strategies.

The study also offers several implications for practitioners and policymakers. For companies, the results highlight the need to move beyond checklist approaches and embed double materiality. For regulators and standard setters, the analysis suggests that additional guidance, oversight, and assurance mechanisms may be needed to ensure that double materiality assessments remain useful for decision-makers and do not drift toward superficial reporting uniformity.

This study provides important insights into the early stages of double materiality reporting under the ESRS, contributing to the literature on the transition to more structured and harmonised sustainability disclosure frameworks [37,42]. The introduction of the ESRS represents a significant regulatory change aimed at improving the transparency, comparability, and consistency of corporate sustainability disclosures across the European Union [43]. In this context, the prior literature highlights an increasing trend toward harmonisation driven by regulatory developments, although significant challenges remain in achieving effective implementation and comparability across firms [44].

However, our findings suggest that, despite this regulatory push, reporting practices remain heterogeneous, particularly in the early stages of ESRS adoption. This coexistence of increasing standardisation and persistent diversity in reporting approaches is consistent with prior evidence showing that sustainability reporting practices have continued to be shaped by institutional, regulatory, and organisational differences across countries [8,33]. In particular, recent research indicates that even under mandatory reporting regimes, variations in disclosure practices and transparency outcomes persist due to differences in national institutional environments and stakeholder pressures [32,34].

From a forward-looking perspective, these findings highlight that the path toward fully harmonised sustainability reporting is likely to be gradual and uneven. While the ESRS framework is designed to promote comparability and consistency, early evidence suggests that firms exhibit different levels of preparedness, alignment, and reporting sophistication, particularly depending on their size, experience, and resource availability [42]. Moreover, the complexity of ESG disclosures and the evolving nature of regulatory requirements continue to pose challenges for organisations adapting to this new reporting landscape [36].

Therefore, these results have important implications for future research, as they provide early empirical evidence of how organisations respond to emerging sustainability reporting requirements. In particular, they highlight the need for further longitudinal analyses examining whether reporting practices converge over time as regulatory frameworks mature, as well as how institutional and organisational factors continue to shape disclosure practices [45,46]. Overall, this study reinforces the view that sustainability reporting should

be understood as an evolving, dynamic process in which regulatory convergence coexists with persistent divergence in reporting practices across contexts.

This study is subject to some limitations that should be considered when interpreting its findings. The structure of the dataset, organised at the company topic level, implies that observations within the same firm may not be fully independent. This leads to a cautious interpretation of the statistical analyses as descriptive robustness checks rather than as a basis for formal inference. In addition, the relatively small sample size, combined with sectoral and geographical heterogeneity, constrains the generalisability of the results, although the findings are useful for showing this first reporting in specific companies of the sector. The analysis relies exclusively on publicly disclosed corporate information, capturing reporting practices rather than underlying organisational changes. Consequently, the obtained conclusions do not reference the internal practices or the assessment of decision-making processes for double materiality, particularly in the absence of interviews or other qualitative evidence. The findings are also conditioned by the early stage of ESRS implementation, although having this information is also an advantage. First-year reports may reflect temporal trends, including learning effects, inconsistencies in reporting formats, and variation in the use of ESRS terminology. These factors are further influenced by differences in regulatory, linguistic, and institutional contexts across countries, as well as by varying levels of alignment with ESRS within the sample. Finally, the study does not incorporate a direct measure of disclosure quality; therefore, the extent of topic coverage should not be interpreted as an indicator of reporting quality.

Overall, the findings suggest that, even in its initial phase, the ESRS framework appears to be associated with how companies identify, prioritise, and communicate sustainability issues. The indicative evidence underscores both the structuring of the potential association with mandatory reporting requirements and the importance of sector-specific factors in determining how these rules play out in practice.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/world7070106/s1, Table S1: ESRS Based Coding Matrix and Codebook, Table S2: ESRS Based Coding Matrix; Section S1. ESRS-Based Coding Matrix and Codebook.

Author Contributions: Conceptualization, S.M.-H., P.F.-M. and E.O.-M.; Methodology, S.M.-H., P.F.-M. and E.O.-M.; Formal Analysis, S.M.-H., P.F.-M. and E.O.-M.; Investigation, S.M.-H., P.F.-M. and E.O.-M.; Data Curation, S.M.-H., P.F.-M. and E.O.-M.; Writing—Original Draft Preparation, S.M.-H., P.F.-M. and E.O.-M.; Writing—Review and Editing, S.M.-H., P.F.-M. and E.O.-M.; Visualisation, S.M.-H., P.F.-M. and E.O.-M. All authors have read and agreed to the published version of the manuscript.

Funding: This research is a result of the project 00226_CJI_2026 financed by the Universidad Tecnológica Atlántico-Mediterráneo (UTAMED).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors on request.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Gray, R. Social, environmental and sustainability reporting and organisational value creation? Whose value? Whose creation? *Account. Audit. Account. J.* **2006**, *19*, 793–819. [CrossRef]
2. Adams, C.A. Conceptualising the contemporary corporate value creation process. *Account. Audit. Account. J.* **2017**, *30*, 906–931. [CrossRef]

3. D'Amore, G.; Testa, M.; Lepore, L. How Is the Utilities Sector Contributing to Building a Sustainable Future? A Systematic Literature Review of Sustainability Practices. *Sustainability* **2023**, *16*, 374. [CrossRef]
4. Sinha, S.K.; Davis, C.; Gardoni, P.; Babbar-Sebens, M.; Stuhr, M.; Huston, D.; Cauffman, S.; Williams, W.D.; Alanis, L.G.; Anand, H.; et al. Water sector infrastructure systems resilience: A social–ecological–technical system-of-systems and whole-life approach. *Camb. Prism. Water* **2023**, *1*, e4. [CrossRef]
5. Rentschler, J.; Salhab, M.; Jafino, B.A. Flood exposure and poverty in 188 countries. *Nat. Commun.* **2022**, *13*, 3527. [CrossRef] [PubMed]
6. DIRECTIVE (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 Amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as Regards Corporate Sustainability Reporting. Available online: https://eur-lex.europa.eu/eli/dir/2022/2464/oj/eng (accessed on 1 July 2025).
7. Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 Supplementing Directive 2013/34/EU of the European Parliament and of the Council as Regards Sustainability Reporting Standards. 2023. Available online: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023R2772 (accessed on 1 July 2025).
8. Simoni, L.; Bini, L.; Bellucci, M. Effects of social, environmental, and institutional factors on sustainability report assurance: Evidence from European countries. *Meditari Account. Res.* **2020**, *28*, 1059–1087. [CrossRef]
9. Grigaitytė, E.; Rudžionienė, K. Differences in methodology for assessing double materiality: Do entities understand the ESRS requirements in the same way? *Public Secur. Public Order* **2025**, *37*, 39–53. [CrossRef]
10. Voulvoulis, N. Water reuse from a circular economy perspective and potential risks from an unregulated approach. *Curr. Opin. Environ. Sci. Health* **2018**, *2*, 32–45. [CrossRef]
11. GWI. Who Are the World's Top 50 Water Businesses? 2024. Available online: https://www.globalwaterintel.com/articles/who-are-the-world-s-top-50-water-businesses-2025 (accessed on 10 July 2025).
12. Forstinus, N.O.; Ikechukwu, N.E.; Emenike, M.P.; Christiana, A.O. Water and Waterborne Diseases: A Review. *Int. J. Trop. Dis. Health* **2016**, *12*, 1–14. [CrossRef] [PubMed]
13. Bain, R.; Johnston, R.; Mitis, F.; Chatterley, C.; Slaymaker, T. Establishing Sustainable Development Goal Baselines for Household Drinking Water, Sanitation and Hygiene Services. *Water* **2018**, *10*, 1711. [CrossRef]
14. Bebbington, J.; Unerman, J.; O'Dwyer, B. *Sustainability Accounting and Accountability*, 2nd ed.; Routledge: London, UK, 2014; pp. 1–300. [CrossRef]
15. Eccles, R.G.; Krzus, M.P.; Ribot, S. Meaning and Momentum in the Integrated Reporting Movement. *J. Appl. Corp. Financ.* **2015**, *27*, 8–17. [CrossRef]
16. Jackson, G.; Bartosch, J.; Avetisyan, E.; Kinderman, D.; Steen Knudsen, J. Mandatory Non-financial Disclosure and Its Influence on CSR: An International Comparison. *J. Bus. Ethics* **2020**, *162*, 323–342. [CrossRef]
17. Ortiz-Martínez, E.; Marín-Hernández, S. European SMEs and non-financial information on sustainability. *Int. J. Sustain. Dev. World Ecol.* **2021**, *29*, 112–124. [CrossRef]
18. Boiral, O. Sustainability reports as simulacra? A counter-account of A and A+ GRI reports. *Account. Audit. Account. J.* **2013**, *26*, 1036–1071. [CrossRef]
19. Hummel, K.; Schlick, C. The relationship between sustainability performance and sustainability disclosure—Reconciling voluntary disclosure theory and legitimacy theory. *J. Account. Public Policy* **2016**, *35*, 455–476. [CrossRef]
20. DiMaggio, P.J.; Powell, W.W. The iron cage revisited institutional isomorphism and collective rationality in organizational fields. *Adv. Strateg. Manag.* **2000**, *17*, 143–166. [CrossRef]
21. Meyer, J.W.; Rowan, B. Institutionalized Organizations: Formal Structure as Myth and Ceremony. *Am. J. Sociol.* **2021**, *83*, 340–363. [CrossRef] [PubMed]
22. Garcia-Sanchez, I.M.; Cuadrado-Ballesteros, B.; Frias-Aceituno, J.V. Impact of the Institutional Macro Context on the Voluntary Disclosure of CSR Information. *Long. Range Plan.* **2016**, *49*, 15–35. [CrossRef]
23. Michelon, G.; Pilonato, S.; Ricceri, F. CSR reporting practices and the quality of disclosure: An empirical analysis. *Crit. Perspect. Account.* **2015**, *33*, 59–78. [CrossRef]
24. Freeman, R.E. *Strategic Management: A Stakeholder Approach*; Cambridge University Press: Cambridge, UK, 2015; pp. 1–276. [CrossRef]
25. Spence, M. Job market signaling. *Q. J. Econ.* **1973**, *87*, 355–374. [CrossRef]
26. Connelly, B.L.; Certo, S.T.; Ireland, R.D.; Reutzel, C.R. Signaling Theory: A Review and Assessment. *J. Manag.* **2011**, *37*, 39–67. [CrossRef]
27. Cheng, B.; Ioannou, I.; Serafeim, G. Corporate social responsibility and access to finance. *Strateg. Manag. J.* **2014**, *35*, 1–23. [CrossRef]
28. El Ghoul, S.; Guedhami, O.; Kwok, C.C.Y.; Mishra, D.R. Does corporate social responsibility affect the cost of capital? *J. Bank. Financ.* **2011**, *35*, 2388–2406. [CrossRef]

29. García-Sánchez, I.M.; Martínez-Ferrero, J. How do independent directors behave with respect to sustainability disclosure? *Corp. Soc. Responsib. Environ. Manag.* **2018**, *25*, 609–627. [CrossRef]
30. Crossley, R.M.; Elmagrhi, M.H.; Ntim, C.G. Sustainability and legitimacy theory: The case of sustainable social and environmental practices of small and medium-sized enterprises. *Bus. Strategy Environ.* **2021**, *30*, 3740–3762. [CrossRef]
31. Khan, M.; Serafeim, G.; Yoon, A. Corporate Sustainability: First Evidence on Materiality. *Account. Rev.* **2016**, *91*, 1697–1724. [CrossRef]
32. Ferri, L.M. The influence of the institutional context on sustainability reporting. A cross-national analysis. *Soc. Responsib. J.* **2017**, *13*, 24–47. [CrossRef]
33. Tariq, A. Mandatory sustainability reporting and the disclosure-performance gap: Insights from the EU directive. *Meditari Account. Res.* **2025**, *33*, 536–567. [CrossRef]
34. Buallay, A.; Hamdan, A. Guest editorial: Sustainability reporting in different institutional and regulatory environments. *Compet. Rev. An. Int. Bus. J.* **2023**, *33*, 1–6. [CrossRef]
35. Dincer, B.; Dincer, C. Insights into Sustainability Reporting: Trends, Aspects, and Theoretical Perspectives from a Qualitative Lens. *J. Risk Financ. Manag.* **2024**, *17*, 68. [CrossRef]
36. Luo, L.; Tan, X.; Zhou, Q. Disaggregating the impacts of ESG: A perspective through the European sustainability reporting standards. *J. Account. Lit.* **2026**, 1–45. [CrossRef]
37. Baumüller, J.; Sopp, K. Double materiality and the shift from non-financial to European sustainability reporting: Review, outlook and implications. *J. Appl. Account. Res.* **2022**, *23*, 8–28. [CrossRef]
38. Papafloratos, T.; Pantazi, T. A Systematic Review of the Effects of Mandatory Corporate Sustainability Reporting. *Sustainability* **2025**, *17*, 5336. [CrossRef]
39. Posadas, S.C.; Ruiz-Blanco, S.; Fernandez-Feijoo, B.; Tarquinio, L. Institutional isomorphism under the test of Non-financial Reporting Directive. Evidence from Italy and Spain. *Meditari Account. Res.* **2023**, *31*, 26–48. [CrossRef]
40. Dunfjäll, M. Materiality in Transition: Challenges and Opportunities in Corporate Sustainability Reporting under the CSRD. *Eur. J. Risk Regul.* **2025**, *16*, 927–941. [CrossRef]
41. Ortiz-Martínez, E.; Marín-Hernández, S.; Antón-Renart, M. Spanish economist-accountants' perceptions of changes in regulation due to IFRS adoption. *J. Int. Account. Audit. Tax.* **2022**, *49*, 100508. [CrossRef]
42. Fragidis, G.; Papafloratos, T. An Information Architecture for the European Sustainability Reporting Standards (ESRS). *Sustainability* **2025**, *17*, 7675. [CrossRef]
43. Leal Filho, W.; Wall, T.; Williams, K.; Dinis, M.A.P.; Fernandez Martin, R.M.; Mazhar, M.; Gatto, A. European sustainability reporting standards: An assessment of requirements and preparedness of EU companies. *J. Environ. Manag.* **2025**, *380*, 125008. [CrossRef]
44. Pizzi, S.; Venturelli, A.; Caputo, F. Regulating Sustainability Reporting in Europe: De Jure Harmonisation or De Facto Standardisation? *Account. Eur.* **2025**, *22*, 51–75. [CrossRef]
45. Zaccone, M.C. Making different sense of corporate sustainability reporting directive: Emotion, identity and divergent professional pathways. *Sustain. Account. Manag. Policy J.* **2025**, 1–22. [CrossRef]
46. Delegkos, A.E.; Skordoulis, M.; Kalantonis, P. Business Strategies and Corporate Reporting for Sustainability: A Comparative Study of Materiality, Stakeholder Engagement, and ESG Performance in Europe. *Sustainability* **2025**, *17*, 8814. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.