ARUP

Frank Water

Beyond the Boundary

ESG Reporting Frameworks Relevant to Water Resources Management and Water Stewardship | Literature Review

Reference:

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Acronyms

AWS	Alliance for Water Stewardship
BRSR	Business Responsibility and Sustainability Report
CDP	The Carbon Disclosure Project
CDSB	Climate Disclosure Standards Board
CII	Confederation of Indian Industry
CSRD	Corporate Sustainability Reporting Directive
DNSH	'Do no significant harm'
DSS	Decision Support System
EFRAG	European Financial Reporting Advisory Group
ESG	Environmental, Social and Governance
ESRS	European Sustainability Reporting Standards
FSB	Financial Stability Board
GHG	Greenhouse gas
GRI	Global Reporting Initiative
IFC	International Finance Cooperation
IFRS	International Financial Reporting Standards
ISSB	International Sustainability Standards Board
Myrada	Mysore Resettlement and Development Agency
NGO	Non-governmental Organisation
NITI	National Institution for Transforming India
PPP	Purchasing Price Parity
SDG	Sustainable Development Goal
SEBI	Securities and Exchange Boards of India
TCFD	Climate-related Financial Disclosures
UNGC	United Nations Global Compact
WEF	World Economic Forum

1. Introduction

1.1 India's Water Resources Challenge

India is facing a serious water crisis due to population growth, rapid urbanisation, and poor conservation efforts (Patra et al., 2018). Among similar emerging economies, India has the highest water usage (Food and Agriculture Organization, 2020). Over the years, access to water has drastically declined for the average person in India, from 5,178 m3 per year in 1951 to 1,651 m3 by 2011, leading to India being labelled as 'water-stressed' (water stress indicator threshold is 1,700 m3/capita/year) for the first time (Damkjaer and Taylor, 2017; Central Water Commission, 2019). By 2051, this availability could plummet further to 1,228 m3, according to government estimates (ibid.).

Irrigation accounts for the majority of water demand in India, exacerbating the strain on water resources (Kijne, 2010). Additionally, groundwater levels in one in four districts are in critical stages, while inadequate data hampers accurate assessment of groundwater quality, with 56% of monitoring stations lacking data on arsenic presence (Nayak *et al.*, 2023). Water pollution is also rampant, with nearly half of the rivers in India polluted, posing serious health risks (Central Pollution Control Board, 2022).

Despite government initiatives to improve water access, challenges persist, especially in rural areas where contamination and lack of treatment remain significant issues. As of 2022, nearly half of the country lacks access to safe sanitation services, reflecting the extent of the problem. India ranks as 130 out of 193 in the UN Sustainable Development Index, which underscores the urgency of the situation (UNDP, 2022).

Various factors contribute to the water crisis in India, including population pressure, groundwater over-extraction, unequal distribution, pollution, climate change and interstate water disputes. This crisis extends to peri-urban areas, which face unique challenges due to their transitional nature between urban and rural environments.

To address the water crisis in peri-urban environments, integrated approaches are needed, considering socio-economic, environmental, and institutional factors. Strategies may include investing in water infrastructure, implementing groundwater management measures, strengthening water governance, promoting community participation, and integrating peri-urban water management into broader urban planning strategies. (Raj Malhotra [@Rajmalhotrachd], 2024; Venkatesan, 2024).

1.2 Water Resources Management and Water Stewardship in ESG Reporting

'ESG reporting' is the practice of transparently disclosing a company's environmental, social, and governance (ESG) performance to stakeholders, reflecting its commitment to sustainable and responsible business practices (Bose, 2020). ESG reporting serves as a vital tool for identifying and managing risks associated with water scarcity, pollution, and regulatory changes. By systematically assessing and disclosing water-related risks, companies can proactively implement mitigation measures, safeguarding their operations and reputation.

Performance benchmarking is facilitated through ESG reporting, allowing companies to measure their water efficiency, usage, and conservation efforts against industry peers and best practices. This benchmarking not only highlights areas for improvement but also showcases leadership and innovation in water stewardship.

Moreover, ESG reporting enhances investor confidence and facilitates access to capital by providing investors with comprehensive insights into the water-related risks and opportunities of a company. Companies with robust water management practices are perceived as less risky investments, attracting capital from socially responsible investors.

Regulatory compliance and reputation management are also strengthened through ESG reporting as companies demonstrate their adherence to water-related regulations and commitments. By proactively addressing compliance issues and disclosing efforts to mitigate environmental impacts, companies can enhance their reputation and build trust with stakeholders (Ramsden-Knowles and Griffin, 2022; Lynch, 2023).

Finally, ESG reporting fosters innovation and collaboration by encouraging companies to explore new technologies, partnerships, and sustainable practices to address water challenges. By sharing best practices and

lessons learned, companies can collectively drive progress towards more sustainable water management solutions.

2. Methodology

This study is guided by the overarching research question of developing an appropriate data management and decision-making framework, tailored to assist smallholder farmers and other local water users impacted by global supply chain water use in India, with the ambition of adopting to the approach for other developing countries. This study is one of the three thematic areas covered under the Beyond the Boundary project being undertaken by Frank Water: [TA1] Literature of ESG reporting requirements in relation to Water Resources Management.

2.1 Objectives of the Project

The objectives of the Beyond the Boundary project are:

1. To enable supply chain locations to act as water stewards within their operating watersheds;
2. To incentivise equitable water resource allocations for marginalised populations.

2.2 Objective of the Literature Review

A literature review has been conducted to examine existing and emerging ESG (Environmental, Social, and Governance) reporting requirements pertaining to water resources management. This review will involve sourcing and synthesising relevant academic papers, reports, and policy documents to gain insights into current best practices and regulatory frameworks. An interactive workshop was also conducted with Frank Water and local stakeholders to gather qualitative data through discussions, narratives, and experiences.

Themes and patterns identified through thematic analysis from both the literature review and workshops will inform the development of approaches aimed at promoting water stewardship.

2.3 Literature Review Methodology

1. **Incorporation of Workshop Insights:**

Integrate insights gathered from the workshop conducted with Frank Water, including discussions on aligning Business Responsibility and Sustainability Report (BRSR) indicators with existing data categories. Potential collaborations were explored with organisations such as Myrada, an Indian NGO with a proven track record in rural development initiatives spanning livelihoods enhancement, and community empowerment. This initiative aims to address water-related challenges through research, advocacy, and the development of innovative frameworks. Feedback and suggestions received during the workshop shed light on corporate perceptions of ESG reporting in India, emphasising the need for clearer guidelines, capacity building, and industry-wide collaboration to overcome challenges and maximise the impact of sustainability initiatives.

2. **Analysis and Discussion:**

Analyse the synthesised literature and workshop insights to provide a comprehensive overview of water resource management and water stewardship practices in peri-urban environments in India. Discuss the strengths, weaknesses, opportunities, and threats associated with existing frameworks and approaches, as well as potential synergies and areas for further research or collaboration.

3. **Conclusion and Recommendations:**

Summarise the main findings of the literature review, emphasising key takeaways for practitioners, policymakers, NGOs, and other stakeholders involved in water management initiatives in peri-urban environments. Provide recommendations for future research directions, policy interventions, and practical strategies to enhance water resource management and water stewardship practices in peri-urban environments in India, considering the insights gathered from the literature and workshop discussions.

3. Current State of ESG Reporting

3.1 Review of ESG Reporting Frameworks Outside India

Environmental, social, and governance (ESG) reporting has become increasingly critical for organisations worldwide. Investors, stakeholders, and the public are demanding transparency regarding the impact organisations have on the environment and on society, and their governance practices. As a result, robust ESG reporting frameworks have emerged to guide companies in disclosing relevant information.

In this section, the following well-known frameworks are explored (in chronological order);

- Global Reporting Initiative (GRI),
- European Sustainability Reporting Standards (ESRS),
- The Carbon Disclosure Project (CDP), and
- Alliance for Water Stewardship (AWS)

Such frameworks play a pivotal role in enhancing transparency and accountability in corporate reporting. These standards cover various ESG aspects, including water-related disclosures.

Global Reporting Initiative (GRI)

The Global Reporting Initiative (GRI) is a globally recognised organisation that develops sustainability reporting standards (GRI, 2018). The first version of GRI guidelines launched in 2000; Guidance for corporate reporting on SDGs launched in 2017 (GRI, 2024). The purpose is to promote transparency, accountability, and sustainable development through robust reporting practices. The GRI consists of a set of interrelated, modular standards; these include three universal standards applicable to every organisation preparing a sustainability report. Additionally, there are 33 topic-specific standards, each addressing material topics such as water, occupational health and safety, and anti-corruption (GRI, 2018). Most relevant is, the GRI 303 standard which focuses on water and effluents.

The key principles of ‘GRI 303: Water and Effluents Standard’ are accuracy and balance; information provided must be correct and sufficiently detailed and reporting should be unbiased, representing both negative and positive impacts of the organisation. Through this, organisations gain a deep understanding of water use, assessing impacts on water resources that benefit ecosystems, other local water users, and the organisation itself. This understanding informs effective water management practices.

GRI 303 provides a structured framework for organisations to report on water-related aspects. It enables transparent disclosure of water stewardship efforts, aligning with ESG reporting requirements. By adhering to GRI principles, organisations contribute to sustainable water resource management and demonstrate their commitment to responsible practices.

European Sustainability Reporting Standards (ESRS)

ESRS is a comprehensive set of sustainability reporting standards developed to enhance transparency. EU adopted it in July 2023 (Berrigan, 2023). It is important to note that the ESRS standards are still under development at the time of this review. While the standards are not yet final, they can still provide valuable insights into the expected requirements.
These ESG reporting metrics should also be aligned with EU Taxonomy (Barral, 2023; KPMG, 2024). EU Taxonomy is a classification system that defines economic activities that are qualified as environmentally sustainable through meeting several conditions (European Commission, 2023b). By meeting the Taxonomy conditions, an activity becomes "taxonomy-aligned" and can potentially attract sustainable investments (European Commission, 2023a).

As part of the EU Action Plan on Sustainable Finance, companies are required to publish taxonomy-aligned indicators under Article 8 (disclosure obligation) of the EU Taxonomy Regulation, with six environmental objectives:

Climate change mitigation: This objective focuses on activities that reduce greenhouse gas emissions and help achieve climate neutrality.

Climate change adaptation: This objective covers activities that strengthen resilience to the impacts of climate change, such as rising sea levels or extreme weather events.

Sustainable use and protection of water and marine resources: This objective aims to ensure the sustainable use of water resources and protect marine ecosystems.

Circular economy: This objective encourages activities that minimise waste and pollution by keeping products and materials in use for longer.

Preventing and controlling pollution: This objective covers activities that aim to reduce pollution of air, water, and soil.

Biodiversity and ecosystem protection: This objective focuses on activities that protect and restore biodiversity and ecosystems.

For companies to be classified as sustainable under EU Taxonomy, their activity must contribute to at least one of the environmental objectives and 'do no significant harm' (DNSH) to any others, this includes sustainable use and protection of water and marine resources. It gives description and technical screening criteria to assess if an economic activity qualifies as contributing substantially to the third objective above and DNSH to others. The activities include:

- *Manufacturing*
- *Water Supply, Urban wastewater treatment, and Sustainable Urban Drainage Systems (SUDS)*
- *Nature-based solutions for flood and drought risk prevention and protection*
- *Provision of Information Technology (IT) / Operational Technology (OT) data-driven solutions for leakage reduction*

The ESRS E3 standard, specifically addresses water and marine resources (European Financial Reporting Advisory Group (EFRAG), 2022b, p. 3). The standard provides disclosure requirements for companies to report on water-related practices and impacts. The focus includes both surface water and groundwater.

The key principles of 'ESRS E3: Water and Marine resources' include policies, targets, action plans and performance management.

- **Policies**: companies should disclose policies implemented to manage water and marine resources.
- **Targets:** measurable targets related to water and marine resources must be reported.
- **Action plans:** companies should outline action plans and allocate resources for water management.
- **Performance management:** reporting on water management performance and intensity is essential (European Financial Reporting Advisory Group (EFRAG).

The Carbon Disclosure Project (CDP)

The Carbon Disclosure Project (CDP) is a globally recognised organisation that plays a crucial role in advancing environmental disclosure and sustainability practices. The CDP was established in 2000, asking companies to disclose their climate impact (CDP, 2024a). The intent is to promote transparency, accountability, and sustainable business practices by encouraging companies to report on environmental impacts (CDP, 2024d).

The CDP provides a comprehensive questionnaire covering various environment-related metrics, including water usage and climate change. Companies participating in the CDP disclosure process respond to this questionnaire, providing data on their water-related practices and performance. Based on the results, companies receive a sustainability score and valuable insights into whether they face ESG risks or opportunities related to water stewardship.

The key principles of CDP water reporting include; transparency, risk assessment, opportunity identification and stakeholder engagement (Genesis Water Technologies, 2023).

Transparency: CDP encourages companies to be transparent about their water-related practices, challenges, and goals.

Risk assessment: by reporting on water usage, companies can assess risks associated with water scarcity, quality, and regulatory compliance.

Opportunity identification: CDP helps companies identify opportunities for sustainable water management, innovation, and cost savings.

Stakeholder engagement: reporting fosters engagement with stakeholders, including investors, customers, and local communities (Genesis Water Technologies, 2023).

The CDP framework displays high-quality mandatory water disclosure, and the recommendations guide companies toward effective and meaningful water disclosure. These guidelines ensure that water-related information is accurate, relevant, and aligned with global best practices (CDSB, 2021). By participating in CDP and adhering to the principles, a company will contribute to sustainable water resource management and demonstrate commitment to environmental stewardship.

CDP has introduced an integrated questionnaire that significantly impacts how companies report on environmental performance (CDP, 2024c). Starting in 2024, the integrated questionnaire combines all three existing questionnaires across climate, forests, and water security, in one comprehensive framework. The goal is to streamline reporting, reduce repetition, and enhance interoperability within the CPD (Continuing Professional Development) voluntary reporting mechanisms.

By integrating the questionnaires, companies can avoid duplicating efforts and provide a holistic view of their environmental impact. It aligns with the transition toward a 1.5°C climate target and nature-positive world. The integrated approach creates a unity and enhances efficiency as companies will complete a single questionnaire covering climate, forests, and water security, and all relevant information will be consolidated. Through holistic reporting, companies can address multi-environmental issues comprehensively; accelerating corporate action, fostering transparency and responsible practices (Molfetas, 2024). However, there is a risk that by integrating questionnaires water issues are given less prominence.

Alliance for Water Stewardship (AWS)

The Alliance for Water Stewardship (AWS) Standard is a globally applicable water stewardship certification framework designed for major water users (AWS, 2019a). The AWS International Water Stewardship Standard Version 1.0 was published in 2014 (AWS, 2014). It enables these users to understand water use, impacts, and risks within a catchment context. The goal is to drive social, environmental, and economic benefits at the scale of a catchment.

The AWS Standard encourages water-using sites to progressively move toward best practice by focusing on five outcomes; good water governance, sustainable water balance, good water quality status, healthy ecosystems and safe and respectful working conditions (The Water Council, 2022).

Good water governance: sites should engage in collaborative approaches involving business, industry, government, community, and civil society organisations.

Sustainable water balance: sites must manage water resources efficiently, considering both quality and quantity.

Good water quality status: sites should protect and enhance water quality.

Healthy ecosystems: sites must contribute to the health of ecosystems within the catchment.

Safe and respectful working condition: sites should ensure that water-related activities are conducted in a manner that respects human rights and promotes worker well-being (ICMM, 2023).

The AWS Standard provides a five-step continual improvement framework for water stewards; commit, understand, plan, implement and evaluate and communicate. There are various benefits to implementing the

AWS standard; for example, risk mitigation, stakeholder engagement, shared challenges, global applicability and ESG reporting (Dubey, 2022).

4. Review of ESG Reporting in India

There are two primary ESG and water-related reporting frameworks reviewed for this report. These are:

- Confederation of Indian Industry (CII) water neutrality approach, released July 2023
- Securities and Exchange Board of India (SEBI) Business Responsibility and Sustainability Report (BRSR), released 2021

This section reviews the frameworks and any overlap with the reporting frameworks outside of India.

4.1 BRSR Reporting Framework

The Business Responsibility and Sustainability Report (BRSR) is an ESG reporting framework released by the Securities and Exchange Board of India (SEBI) in 2021, superseding Business Responsibility Report (BRR) prescribed in 2012 (Surabhi Gupta, 2021; Ramanan, 2024). BRSR started as voluntary in 2021 but from 2022/23, it is mandatory for the top 1,000 listed companies, by market capitalisation in India, to submit BRSR.

Based on the submitted BRSR filled by Indian entities in 2022/23, 31% (332 out of 1,059) of entities have recognised water management as a significant risk, and less than 30% undertake independent assurance on water-related metrics (Ramanan, 2024). It was found that mandatory metrics such as water withdrawal was not reported (ibid.).

It is also understood that BRSR is commonly presented as a minimum requirements pro forma reporting, where figures are reported without further auditing. If figures are not provided, only an explanation as to why they are absent is required (Tiwari, 2024).

In July 2023, SEBI introduced a framework for assurance called BRSR Core, mandating assurance for BRSR in four years, from 2023/24 up to 2026/27, according to a set of key performance indicators (Surabhi Gupta, 2023). Again, only the top 1,000 listed companies by market capitalisation are required, under the listed regulation, to undertake ESG disclosure of their supply chain (Surabhi Gupta, 2023).

At the same time, a regulatory framework for ESG Rating Providers (ERPs) has been introduced (Nandwani, 2023). Entities engaged in or proposed to be engaged in the business of issuing ESG ratings, will now need to be registered with SEBI. The SEBI (Credit Rating Agencies) Regulations (1999) provide the eligibility criteria to qualify for certification, categories of ERPs, disclosure requirements targeted at ensuring transparency and prevention of conflict of interest, etc. Similarly, the EU reached a provisional agreement in February 2024 to regulate ESG ratings (Store, 2024). These regulations aim to address concerns about the lack of transparency and accuracy in methodologies used by ESG rating providers (European Commission, n.d.). While obtaining an ESG rating may not be mandatory yet, these regulations represent a significant step towards improving the integrity and usefulness of ESG ratings for investors and stakeholders.

SEBI further mandates ESG investment schemes to invest at least 65% of assets under management (AUM) in companies with comprehensive BRSR reporting and that have undertaken BRSR Core assurance from October 2024.

Current BRSR reporting requirements in relation to water are summarised in **Section 0** below.

BRSR Water-related Attributes

BRSR consists of nine ESG attributes, including the water footprint attribute. **Table 1** shows a summary of the parameters under the water footprint ESG attribute required to be reported ('Annexure II Business Responsibility & Sustainability Reporting Format', 2023). See **Appendix A.1** for the complete reporting format.

Table 1 Summary of water reporting requirements in India.

Parameter	Summary of Data & Assurance approach in Annexure I	Summary of parameter to report in Annexure II
Total water consumption	Obtain flow meter logs at input and output for calculation, whereby water consumption = in – out.	Total volume of water withdrawn according to source, namely i) Surface water (ii) Groundwater (iii) Third party water (iv) Seawater / desalinated water (v) Others Total volume of water consumed
Water consumption intensity	Total water consumption divided by total revenue (adjusted for Purchasing Price Parity (PPP)) or count of product/services.	Water intensity per rupee of turnover. Revenue adjusted for PPP for better global comparability
Water Discharge by destination and levels of Treatment	Stated the type of water (i.e. untreated water) and description of the level of treatment graded according to primary, secondary, and tertiary level	Segregating volume of treated and untreated water discharged into different sources, namely Surface water (ii) Groundwater (iii) Third party water (iv) Seawater / desalinated water (v) Others For treated water, level of treatment to be specified.

The BRSR reporting requirements are based on GRI reporting standards.

4.2 CII Water Neutrality Framework

The CII has been leading efforts to create water management standards in India. As part of these efforts it has produced the Compendium on Climate Neutrality – Good Practices by India Inc (2024) (CII, 2024) , following on from the well as the Report on Water Neutrality for Indian Industry - Standardisation of the Definition and Approach (2023) (NITI Aayog, 2023). The latter report forms for the bases of this review because it proposes a framework and approach for water neutrality. This involves key aspects to understanding water use which are common to all frameworks: mapping (water use), monitoring and measuring management of water (**Figure 1**). The approach is recommended for building water neutrality strategies.

Figure 1: CII 3M-7R approach to developing water neutrality strategies

CII envisages water neutrality as "a journey to enable appropriation of practices and measures for an improved water scenario considering both water resource availability and water quality. It aims to help companies proceed towards achieving water positive status through augmentation [of potable water supplies or abstraction for water supply] by various means, such as rainwater harvesting and wastewater reuse/ recycling, treating this to suitable quality and storing it for use.

CII's facilitates certification on water neutrality in India, covering three levels of achievement. The certification level is intended to provide understanding and acknowledgment of efforts of companies in promoting environmental sustainability, supporting corporate responsibility, and actions to mitigate water-related risks. The three certification levels are summarised in **Table 2** below.

Table 2 CII water neutrality framework certification levels

Certification Level	Description of Level	Scope/Focus	Certification Given
Level I	Companies, organisations or institutions undertaking the evaluation of their water status and the components mentioned under scope I	Scope I Focus: Operational efficiency gains maximisation	Water Neutral/Positive Aspiring Company.
Level II	Companies, organisations or institutions undertaking the evaluation of their water status and the components mentioned under scope I	Scope II Focus: Operational sustainability including gaps in offsets, supply chains	Water (Neutral/Positive) Rising Company.
Level III	Companies, organisations or institutions undertaking the evaluation of their water status and the components mentioned under scope I	Scope III Focus: Validation, Verification and Reporting	Water (Neutral/Positive) Achieved Company.

The overview method for assessing water neutrality status – positive, neutral or negative status – is shown in **Figure 2**. The detailed methodology is provided in **Appendix A.1** for reference.

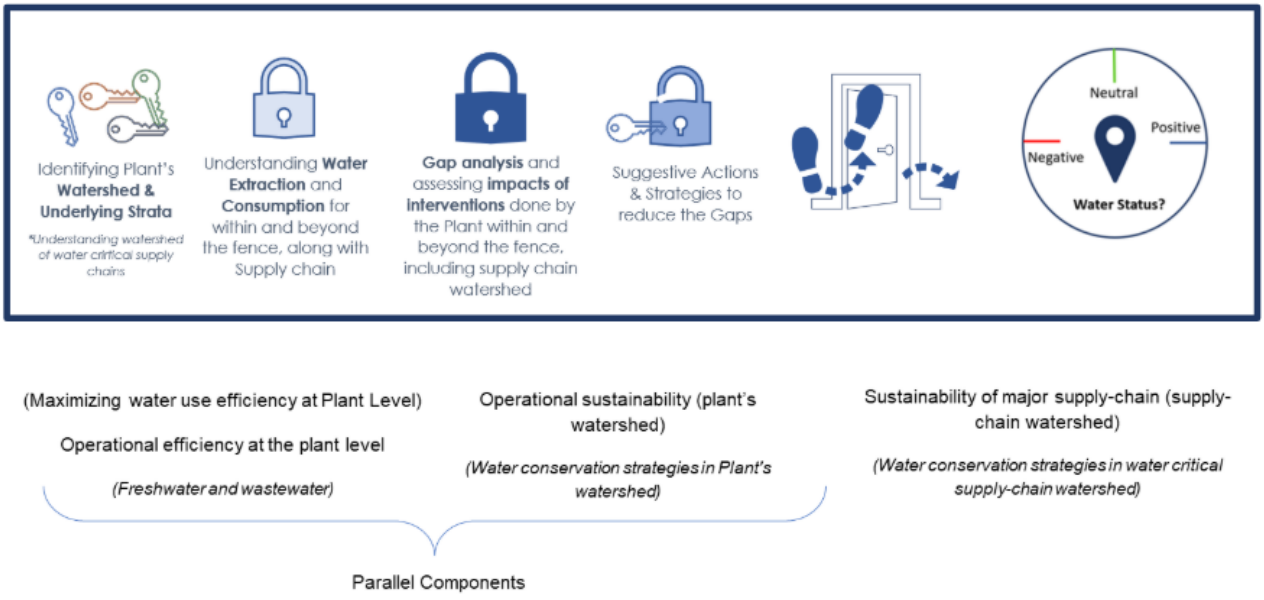

Figure 2: Overview of method for assessing water neutrality status

Note that the CII framework has minimum requirements and qualifications for agencies allowed to assess, audit and certify water neutrality under the framework. NGOs, autonomous bodies or consulting firms of repute having worked in the water resources sector not less than for a period of 15 years can be appointed to assess, audit and certify water neutrality. Within which the assessor, auditor and certifier team should have qualified personnel possessing B.Tech./B.E. in Civil, Chemical, Mechanical Engineering or Post Graduation in Water Resources, Environmental Sciences, or allied subjects.

5. Discussion

This section delves into the applicability and credibility aspects of ESG reporting legislation, focusing on a comparative analysis between India and the European Union (EU). Many companies globally choose to follow frameworks like GRI to report on sustainability (GRI, 2022; KPMG, 2022). Frameworks like GRI provide structure and guidance, but they are not mandatory. Currently, mandating ESG reporting is primarily up to cou

ntry legislation. Although several countries have incorporated measures requiring mandatory ESG disclosures, the EU's CSRD has the largest coverage of companies in mandating ESG reporting, covering more than just publicly listed companies (DeLoach, 2023; Yu, 2024).

By contrasting the approach in India with the EU's, we aim to identify valuable insights that can inform the ongoing development of ESG reporting regulations in India. The discussion will explore the extent to which the BRSR effectively covers relevant entities and industries, and how it ensures the credibility and reliability of reported ESG data. There are also considerations on how the BRSR aligns with, or diverges from, internationally recognised ESG reporting frameworks with a focus on water resources management.

5.1 Applicability and Credibility in ESG Reporting Legislation: India and EU

Company applicability refers to the rules that determine whether a company is legally obligated to produce an ESG report depending on the regulation in the country. In India, the top listed companies by market capitalisation are required to report on ESG. However, market capitalisation fluctuates based on the stock price of a company and this will impact their position within the top 1,000, which could change over time (Faster Capital, 2024; Fidelity, 2024). This may encourage companies to continuously improve their ESG practices because ESG reporting contributes to increase in market value (Turjak and Kristek, 2023), but it could also result in greenwashing (Yu, Luu and Chen, 2020). The limited scope also resulted in overlooking smaller and medium-sized enterprises (SMEs) that might have significant environmental impacts (Ojiambo, 2023). The EU instead has a wider coverage in mandating ESG reporting. Under the Corporate Sustainability Reporting Directive (CSRD), all listed companies, SMEs, broader set of large companies and non-EU companies are required to prepare sustainability reporting according to ESRS. This is expected to impact around 49,000 companies. This includes roughly 10,000 companies from outside the EU (KPMG, 2024).

The credibility of ESG reporting can be enhanced by undertaking external assurance (GRI 1: Foundation 2021). Assurance refers to an independent assessment of information quality provided by an organisation by assurance providers. There are two main levels of assurance for sustainability reports: Limited and Reasonable Assurance. Limited assurance is a lower level of assurance compared to reasonable assurance (Richards, 2021; Lane, 2024). India starts with a higher level of assurance (reasonable), compared to the EU's initial limited assurance. India limits the mandatory reasonable assurance to 250 companies per year in this transition. On the other hand, limited assurance is applied to all companies in the scope of CSRD with a transition to reasonable assurance in three years.

There has been a lack of a universally accepted framework in ESG reporting assurance which may lead to inconsistencies in the assurance process across different companies and assurance providers (Rees and Strevens, 2023). Therefore, the International Auditing and Assurance Standards Board (IAASB) is working on establishing definitive standards for ESG assurance (IAASB, 2024). **Table 3** shows the summary of the comparison between India and EU.

Table 3 Summary of applicability and credibility of India and E.U. ESG Reporting legislation.

Theme	India	EU
Company Applicability	Mandating ESG reporting for top 1000 listed companies based on market capitalisation.	European Union (EU) Corporate Sustainability Reporting Directive (CSRD) required all listed companies, SME, broader set of large companies and non-EU companies to report on ESG factors aligning to EU taxonomy across 4 years.
Credibility	Reasonable (i.e., high but not absolute) assurance for top 1000 companies across 4 years. Limited assurance for ESG value chain.	Limited (i.e. moderate) assurance from 2025, and expecting reasonable assurance by 2028.

5.2 Comparing the BRSR Framework with International Frameworks

As the primary, mandated vehicle for ESG reporting the 2021 adoption of water measures into reporting makes it a reasonable starting point for consideration of water-related reporting. It can be considered slightly broader than the CII, on the basis that it would include more companies than those that are classed as 'industry' under

the CII. Attention is drawn to the review points made in section 4 regarding the limitation in coverage o f BRSR e.g. Top 1,000 companies.

To understand the strengths and shortcomings of BRSR, and the international frameworks highlighted above, the review focused on comparing the frameworks against two common themes: (a) reporting boundary, (b) reporting metrics with a focus on water consumption intensity. Summaries of the reporting boundary and water consumption intensity across all frameworks are shown in **Table 4.**

a. Reporting boundary

A reporting boundary identifies the entities and activities within a group that are included within a report. It establishes the limits of the metrics to be measured and reported on (PwC, 2023; Liepina, 2024). Reporting boundaries are crucial for ensuring consistent and transparent reporting. As highlighted by the Climate Disclosure Standards Board (CDSB), a non-profit for environmental reporting guidance, clear boundaries help users understand what is included in the report and facilitate comparisons between different organisations (CDSB, 2014).

Organisational boundaries are commonly used in financial statements, where they define the entities that are included within the report. These boundaries can be consolidated, meaning subsidiaries and joint ventures are combined, or separate, meaning each company is shown independently (PwC, 2023). In addition, Greenhouse Gas (GHG) protocols that have been well-established and exist in most reporting standards embed the concept of financial, operational control, influence, responsibility, and power to affect (CDSB, 2014).

The boundary for sustainability reporting is expected to be the same as in financial statements; (PwC, 2023) stated in and evident in the reporting boundary in most frameworks (ESRS, GRI and CDP). It is reasonable to argue that reporting in line with financial statements will have a preference towards consolidated reporting, considering that International Financial Reporting Standards (IFRS) prioritise consolidated financial statements when a parent entity has control over subsidiaries (IFRS 10) (IFRS, 2024a),

From the analysis of the frameworks, there is an increase in awareness of the need to extend beyond the boundary of financial reporting in sustainability reports by providing the flexibility for extended organisational boundaries based on materiality assessments (ESRS, GRI), as well as the inclusion of supply chains (BRSR, CDP) (see **Section 6** below for more on materiality assessments). However, mapping supply chains could be a costly and time-consuming exercise, which might be beyond the capacity of some companies (Alliance for Water Stewardship, 2020). SMEs are also likely also to struggle to influence suppliers.

b. Reporting metric

Table 5 shows the usage of metrics across different reporting frameworks. The table does not include water quality metrics because it is not within the scope of this research. AWS does not have a single set of water metrics but focusses on the water balance equation (i.e. Water outflow = Water inflow + Change in storage volume) and a framework for water stewardship, that encourages organisations to track metrics relevant to their specific context. Therefore, AWS will be discussed separately.

Among the water-related reporting metrics, water withdrawals, discharges and consumption are seen in all reporting frameworks. The draft ESRS framework does not state withdrawal and discharge rates as a specific metric to report on but has included an option to set a reduction target for companies. In addition, GRI and ESRS each require high water-risk areas to be reported separately, whereas BRSR gave the condition of reporting for the previous year (look back), and CDP includes previous years and future estimates (look back and look forward).

Water intensity appears in all frameworks except for GRI. The definition of water intensity in BRSR and ESRS measures the volume of water used per unit of economic activity. This is an indicator of economic pressure on a country's water resources, aiming to allocate water across different sectors of the economy (UNSD, 2007). Although water consumption intensity gives insights into the water efficiency of a company over time, the metric limits comparability across companies due to the type of products that will require different amount of water (Schulte *et al.*, 2014). The metric is also not as applicable for companies with diversified product portfolios.

On the other hand, CDP terms water intensity as water consumption efficiency, measuring output per unit of water, in line with SDG indicator 6.4.1: to monitor change in water-use efficiency over time (UNSD, 2023). It is

noted, however, that this does not aim to give a full picture of water utilisation in the country. AWS highlighted the definition of water efficiency as less **net** water used per unit of production. Net water use differs from total water use or withdrawal. Total water withdrawal is the total incoming water supply, including high quality-treated wastewater that is returned to a water body, while net water use is the amount that accounts for losses including evaporation and in finished products. It is important to note that this does not result in less total volume of water use with increased production, therefore reducing total volume of water used should be the aim in water scarce areas, prior to efficiency improvements (Alliance for Water Stewardship, 2020).

Table 4 Comparison of BRSR with other frameworks (ESRS, CDP, AWS and GRI)

Theme	BRSR	Other international frameworks			
		AWS	CDP	ESRS	GRI
Reporting boundary	Consolidated or stand-alone	Requirement to define physical scope considering site boundaries, catchment area, all water usage and wastewater discharges within the company's facilities, regardless of location. Physical scope is also defined as "The land area relevant to the site's water stewardship actions and engagement. It should incorporate the relevant catchment(s) but may extend to relevant political or administrative boundaries. It is typically centred on the site but may include separate areas if the origin of water supply is more distant." (AWS 2.0 Guidance)	Up to 2023, the CDP Water Security 2023 Reporting guidance includes corporate level reporting (i.e., company-wide), but also raises awareness of risk at river basin level by allowing facility-level reporting for facilities that expose the company to water risk (CDP, 2023). Additionally, CDP encourages organisations to align their organisational boundary to financial reporting. In 2024, facility-level information requests will focus on water-related dependencies, impacts, risks, and/or opportunities, where water resources, water use, water shortages, water quality and opportunities to improve water efficiency are included, for both direct operations and the upstream value chain (CDP, 2024b).	ESRS 1 (European Sustainability Reporting Standards) states that the boundary of sustainability reporting should be consistent with financial statements, with necessary extension to include a company's material impacts, risks, and opportunities throughout its value chain (European Financial Reporting Advisory Group (EFRAG), 2022a, 2022b)	No specific requirement for listing entities included in reporting but only requires explanation of the differences if the list of entities differs from financial reporting (Disclosure 2-2 GRI 2: General Disclosures 2021). However, we found that GRI 1: Foundation 2021 encourages companies to align reporting to entities covered in financial reporting.
Metrics	Water consumption intensity	Similar terminology is framed as water efficiency which is defined as "the concept of using less net water for an equivalent purpose or volume of production"(Alliance for Water Stewardship, 2019a) .	Question W1.3 asks for the "…revenue per total water withdrawal volume in the reporting period", in line with SDG indicator 6.4.1 to monitor change in water-use efficiency over time, ((USD/m^3) (CDP, 2023). On the other hand, the same water intensity metric (volume of water per value of product or revenue) is embedded in the questions asked by CDP Supply Chain members (Question SW3.1).	In the draft ESRS E3 standard, water intensity is defined as "…total water consumption in m^3 per net revenue on own operations". This information is noted to support the needs of financial market participants who are subject to EU regulations. The EU Taxonomy Annex 1 sets out criteria to identify activities that significantly benefit the sustainable use and protection of water resources. Leakage control is a key area. Manufacturers are required to implement leakage control technologies in their products. Additionally, water supply systems must have an Infrastructure Leakage Index (ILI) rating below 2 to meet the criteria.	Water intensity metrics are not explicitly included in standards, but GRI provides the building blocks (i.e. water withdrawal data) for companies to calculate water intensity metrics.

Table 5 Metrics that are included (✓) and excluded (✗) from each reporting framework.

Metrics	BRSR	AWS	CDP	ESRS	GRI
Water withdrawal	✓ (by source)	No single set of fixed water metrics.	✓ (by source)	As target only	✓ (by source)
Water consumption	✓		✓	✓	✓
Water discharge	✓ (by destination and level of treatment)		✓ (by destination and level of treatment)	As target only	✓ (by destination and level of treatment)
Water intensity	✓ (total water consumption/revenue)		✓ (total water withdrawal/revenue)	✓ (total water consumption/revenue)	✗
Water stored/change in storage	✗		✓ (disclosed as withdrawal)	✓	✗
Water recycled/reused	✗		✓	✓	✗

5.3 Alternative Frameworks for Consideration

This section briefly covers other non-ESG frameworks that have been identified during the literature review and through discussions within Arup and with Frank Water. They have not been researched to the same extent as the ones on **Section 3.1** but are briefly summarised below for consideration.

City Water Resilience Framework: An Alternative to Company-based Frameworks

Integrating the City Resilience Framework (CWRF) into the discussion of ESG reporting on water resource management and water stewardship can provide a comprehensive, alternative perspective on addressing water challenges within the context of a city's impact on a catchment or catchments. This would recognise that not all significant water use in a catchment is associated with companies or their supply chains. Indeed, municipal water use is a significant water demand, often imposed on catchments with little forethought. In this sense, cities, through their water demand can often have the same impacts on rural and semi-rural communities as large companies and their supply chains.

The CWRF emphasises the importance of enhancing the resilience of cities and their surrounding ecosystems to various shocks and stresses, including those related to water. This could aid cities in understanding their impact on source catchments and other water users in that catchment and provide a framework for regular reporting. In the context of company ESG reporting, incorporating the principles of the CWRF can further help companies understand and address water-related risks and opportunities within urban environments.

Principles include:

- **Infrastructure and Ecosystems:** The CWRF recognises the interdependence between urban infrastructure and natural ecosystems in promoting resilience. Cities or companies can use ESG reporting to assess the resilience of their water infrastructure and explore nature-based solutions for sustainable water management, such as green infrastructure and natural water retention measures.
- **Promotion of Sustainable Practices:** ESG reporting aligned with the CWRF encourages companies or cities to promote sustainable water use practices within urban areas, including initiatives to reduce water consumption, improve water efficiency, and enhance water quality. This can involve partnerships with local governments, community organisations, and other stakeholders to implement water conservation measures and ecosystem restoration projects.
- **Supply Chain and Industrial Estates:** ESG reporting frameworks like the CWRF can extend beyond individual company operations to consider the broader impacts of supply chains and industrial estates on urban water resilience. Companies can collaborate with suppliers, tenants, and neighbouring industries to assess and mitigate shared water risks, such as pollution and over-extraction, through collective chain transparency.
- **Household and Commercial Water Use:** ESG reporting under the CWRF can focus on promoting sustainable water practices at both household and commercial levels within cities. This may include initiatives to raise awareness about water conservation, improve water efficiency in buildings and businesses, and incentivise behaviour change through education incentives.
- **Monitoring and Data:** ESG reporting within the CWRF framework emphasises the importance of robust monitoring and data management systems to track water-related indicators and inform decision-making. Companies can use ESG reporting to disclose their monitoring efforts, data collection methods, and key performance metrics related to water quality, quantity, and resilience.

Task Force on Climate-related Financial Disclosures (TCFD):

TCFD was established by the Financial Stability Board (FSB) in 2015 to develop recommendations for companies to improve reporting on the financial impact of climate change (TCFD, 2022). The TCFD developed a framework with four core recommendations (governance, strategy, risk management, metrics and targets) for public companies and other organisations to disclose climate-related risks and opportunities through their existing reporting channels (TCFD, 2017).

TCFD was disbanded in October 2023 after fulfilling its mission, and its outputs are now taken over by International Sustainability Standards Board (ISSB) to monitor how companies are adopting and implementing climate-related financial disclosures according to their own standard (*IFRS S2: Climate-related disclosures*) (IFRS, 2024c). ISSB is a new organisation established in 2021 under the International Financial Reporting Standards (IFRS) Foundation, aiming to create a global baseline of sustainability reporting standards (IFRS, 2024b). This transition allowed ISSB to further improve their standards by building on TCFD Framework.

The TCFD recommends climate-related metric categories focussed on greenhouse gas emissions and broader climate-related risks, with water scarcity issues being considered physical climate risks under the framework (TCFD, 2021) (See Appendix Table 4). Companies can choose to disclose metrics related to water usage and potential financial impacts of water stress in relevant regions aligning with other frameworks, but there is no evidence that companies have chosen to disclose, according to their October 2023 Status Report (TCFD, 2023).

On the other hand, IFRS is undertaking developments regarding water-related disclosures; *IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information* released in June 2023 acknowledges the CDSB Framework application guidance for water-related disclosures as a potential resource for companies to identify sustainability related risks and opportunities (IFRS, 2023). Industry based sustainability disclosure standards are also being drafted, including the Water Utilities & Services industry (Volume B39) that includes specific water-related disclosure requirements but only for regulated water utility business (IFRS, 2022).

Apart from IFRS, ESRS has also built their framework based upon TCFD. ESRS E2 General Disclosures covers disclosures on governance, strategy, risk management, and metrics and targets, mirroring the structure of the TCFD recommendations. However, ESRS covers a broader scope of sustainability factors including water, as discussed in **Section 5.2** above.

Overall, the TCFD Framework and related IFRS and ESRS E2 disclosures are more inward-looking (i.e. providing tools to understand their risk and exposure), rather than outward-looking (i.e. providing information to others outside the company or industry). They are probably less suited, therefore, to the aims of the Beyond the Boundary project.

6. Incentivising Organisations to Achieve Water Stewardship and ESG Reporting

Given the significance of the proposed CSRD and BRSR obligations, companies need to start preparing for its implementation. This section highlights approaches to overcome the lack of incentives (Lucas *et al.*, 2024) to engage with water stewardship.

6.1 Adopting the AWS Framework

From the foregoing discussion, it is seen that AWS is designed specifically for water stewardship, ensuring that reporting addresses social, cultural, environmental and economic factors specifically related to water use. It provides a comparatively more comprehensive framework for managing water resources throughout a company's operations and supply chain. The other frameworks reviewed, on the other hand, tend to have broader scopes than just water, encompassing various environmental, social, and governance (i.e. ESG) aspects. While they may have water-related sections, they don't tend to be as in-depth as AWS which we believe provides the focus necessary to demonstrate comprehensive water reporting, which is crucial for organisations operating in water-stressed regions or with significant water footprints.

From the review, we conclude that AWS can be aligned with other sustainability reporting frameworks, allowing organisations to integrate water stewardship reasonably seamlessly into overall ESG reporting. In our view, following the AWS framework would encourage transparency in water use data and management practices. Among the reporting frameworks discussed, AWS is also partnered with the ISEAL Alliance (ISEAL, 2024), a membership organisation for sustainability standards which emphasises transparent and effective standard setting.

Cross referencing to internationally accepted reporting frameworks is allowed in India, but there are no universal approaches when reporting under BRSR in India currently. For example, Credit Rating Information Services of India Limited (CRISIL) aligned BRSR using the GRI framework (CRISIL, 2022), whereas (Adani Green Energy Limited, 2022) reports BRSR first then referenced their BRSR alignment with WEF, UNGC, TCFD, IFC and more.

While examining the water aspects of ESG reporting, it is important to note that water is a shared resource and water risks will differ across river basins (Alliance for Water Stewardship, 2019b). Reporting water metrics based on organisational boundary and financial statements limits understanding of the long-term sustainability of water resources. Therefore, water stewardship is critical to improving water security (BSI, 2024). This literature review has found that AWS provides a roadmap to long term sustainable water-use and helps companies demonstrate their commitment to ESG principles.

The AWS Theory of Change (ToC) outlines a multi-stakeholder approach to achieving socially equitable, economically beneficial, and environmentally sustainable water use (Bunclark, 2019). It emphasises interventions such as the development of standards, capacity building, and stakeholder engagement. Implementing the AWS Standard can be expected to produce a chain of events that leads to a long-term goal, as shown in **Figure 3**.

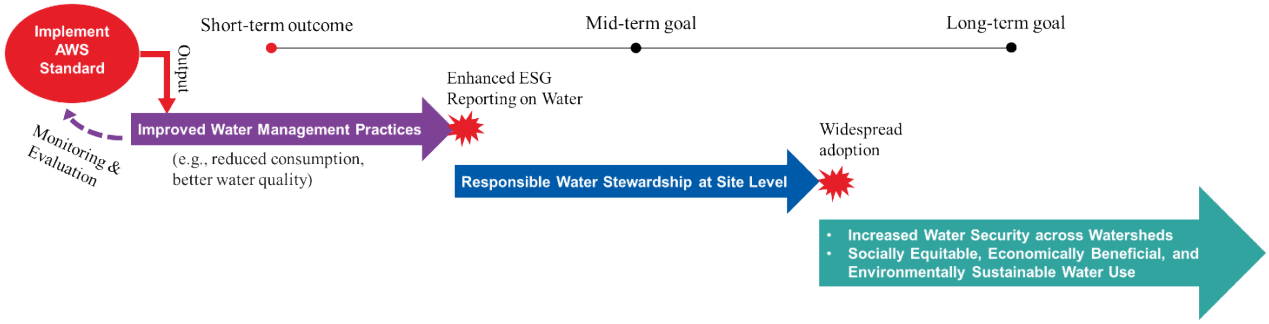

Figure 3: AWS Theory of Change causal pathway

To leverage the AWS Standard, it is recommended that targeted guidance is developed for ESG reporting based on the AWS Standard. This enables water stewardship reporting within broader ESG frameworks. In 2024, Arup created a toolkit to help the retail company, Primark, in transitioning from Higg FEM 4.0 (a tool used for sustainability reporting in the apparel industry) to AWS (Arup, 2024). Through interviews with regional managers and stakeholders, the research with Primark suggested that, in regions like Bangladesh and Cambodia, where brands have a larger influence than governmental influence, focusing on the social value proposition of water stewardship can be particularly effective. By emphasising the alleviation of water stress and its positive impact on communities – directly addressing the "whys" of why water stewardship is important – these "quick wins" can serve as a strong initial motivator for organisations to embark on a more comprehensive ESG reporting and water stewardship journey. The toolkit serves as a training manual for regional managers in Primark's supply chain. It includes regional tailored awareness, guidance in undertaking site assessments and suggestions of actions to improve water efficiency. Stakeholder interviews revealed a strong demand from facilities for case studies that demonstrate water stewardship in action within their region. While the effectiveness of the toolkit in driving adoption remains to be seen, as it has not yet been implemented, the potential benefits of the toolkit are clear.

As the implementation of AWS Standard requires learning and understanding of the approaches, it is important to build capacity by training and forming an AWS implementation team to support integration of the AWS Standard into ESG reporting, ensuring accurate and comprehensive water related data collection. For example, the Nestlé factory in Sheikhupura, Pakistan made an effort to build an internal AWS team to implement the AWS Standard effectively (Waheed, Waseem and Malik, 2020).

There are also shortcomings and challenges that would need to be addressed. While the AWS Standard is robust for water management, it does not encompass all aspects of ESG reporting. Additional frameworks might be needed for a comprehensive ESG report, and this might reduce interest from companies. In addition, achieving AWS certification can be resource intensive; therefore, it is important to build capacity, engage stakeholders and commit to the long term.

6.2 Collaborative Partnerships

Collaboration among businesses, NGOs, governments, and local communities can foster knowledge sharing, innovation, and collective action on water stewardship (Waheed, Waseem and Malik, 2020). Multi-stakeholder initiatives can provide support and resources for companies to implement ESG reporting for water management. For example, the CDP framework has a strategic alliance with The Water Council and KPMG LLP to promote water stewardship and ESG reporting. Through this partnership, companies receive guidance on identifying and managing water-related business risks, understanding adverse impacts on ecosystems and communities, and contributing to sustainable freshwater resource management.

6.3 Driving AWS Certification Adoption Through Policy and Finance

To further incentivise organisations, advocacy efforts should target government policies to recognise AWS certification within national sustainability reporting guidelines (Bunclark, 2019). This creates a competitive advantage for certified organisations, potentially attracting preferential treatment in areas like permitting or tax incentives. Additionally, collaboration with financial institutions can lead to the development of investment safeguards that consider AWS certification. This financially incentivises responsible water management practices by attracting investors with a focus on environmental, social, and governance (ESG) principles.

6.4 Recognition and Rewards

Establishing recognition programs that highlight organisations demonstrating leadership in ESG reporting, particularly water stewardship, provides public recognition and reinforces the importance of responsible water management within the business community. As highlighted by (Bunclark and Scott, 2021), to incentivise organisations for Corporate Water Reporting (CWR) in emerging economies, public recognition is valued. Initiatives like the Blue Certificate in Peru, which recognises companies for reducing their water footprint and improving local water management, can motivate companies to participate in CWR.

6.5 Materiality Assessment for Sustainable Water Resource Management

Materiality assessment is where companies identify the most significant or 'material' ESG that impacts the operations of a company. This allows companies to prioritise actions in addressing sustainability challenges. Materiality assessment is embedded in GRI (GRI 3: Material Topics 2021) and ESRS (ESRS 1 General Principles). The concept of materiality assessment is undergoing a shift, whereby the focus is moving towards "double materiality," a more comprehensive approach driven by EU CSRD regulation. Double materiality includes impact materiality and financial materiality. This approach considers both the impact of environmental and social risk on the financial performance of organisations, and the environment and social impact. The materiality concept can be translated into action by assessing impact, risk, and opportunities on water resources, develop strategies and actions to address them, supported by disclosure on policies, practices, and performance metrics related to water management. The AWS standard does not have a specific materiality assessment tool, but it achieves outcomes similar to impact assessment through the focus on catchment context, stakeholder engagement, risk assessment, and targeted goal setting, which fits into the approach of conducting material assessment (Klein *et al.*, 2023).

A supportive ecosystem can be created that incentivises organisations to adopt water stewardship principles and integrate them into their ESG reporting practices.

7. Recommendations and Conclusions

This literature review focuses on the ESG reporting frameworks in India and selected frameworks outside India, in relation to water resources management and water stewardship. It highlights the water resources pressures in India due to numerous factors such as population growth and urbanisation. The importance of ESG reporting in promoting transparency and accountability, improving governance, and reducing bias in water-related activities is emphasised. The report also discusses the current state of ESG reporting both outside and within India, comparing well known frameworks such as the European Sustainability Reporting Standards (ESRS), Global Reporting Initiative (GRI) and others. It provides insights into India's BRSR and the water-related reporting requirements, discussing the applicability and credibility of ESG reporting legislation in India in comparison to the EU where reporting is mandatory.

7.1 Conclusion

The literature review has found that there is significant variability in the requirements, level of detail, metrics and reporting expectations across the frameworks reviewed. This makes it difficult to directly cross-reference between frameworks as applied in different locations. The review also underscores the continuing evolution of ESG frameworks, emphasising the equally evolving need for transparency and accountability in water resource management and stewardship.

The evolution of ESG reporting to date has been successful in leading to the development of more robust and comprehensive frameworks, enabling organisations to better manage their environmental, social and governance impacts.

The review highlights the significance of water stewardship in achieving long-term sustainable water use, highlighting the role of ESG reporting in driving corporate commitment to environmental principles, including water stewardship. By prioritising water stewardship, organisations can better enhance their sustainability performance, mitigate water-related risks, and contribute to the achievement of global sustainability goals.

The Beyond the Boundary project seeks to establish a Decision Support System (DSS) that goes beyond meeting the BRSR's compliance expectations for corporate water reporting and ensures that local communities are involved and have visibility of water availability and use data. The design goals and data generated through the DSS (Frank Water, 2023) can help companies achieve informative, transparent, and valuable water reporting. This, in turn, becomes a strategic communication tool for businesses. While the initial phase of Beyond the Boundary has focused on catchment-specific data and insights, the approach to the components needs to be extended beyond the catchment to encompass supply chain operations, which would fully align with BRSR's and ESG reporting goals and best practices. The findings of this literature review provide useful context for Frank Water's consideration.

It is important to understand that ESG reporting legislation is still evolving; given the coverage and ongoing evolution of the EU's CSRD framework, in particular, it is possible that BRSR will also continue to evolve. As a long-term strategy for companies to report their sustainability impact, specifically in relation to water, companies must understand the role of watersheds within their supply chains. The AWS framework and its case studies suggest that identifying a reporting boundary is the first step, and that the reporting boundary can be based on a catchment/watershed, but may also include administrative boundaries, facility locations, or a combination. This gives a nod to the requirement to understand water-related terms as used in Beyond the Boundary, BRSR and the DSS to be developed, and how all these align with each other, and how to determine the appropriate scale at which actions should be taken.

7.2 Recommendations

From the literature review of ESG frameworks, the following recommendations can be made for the specific water resource management and water stewardship requirements in a peri-urban environment in India.

The key strategic recommendation, to incentivise organisations towards water stewardship is to consider working with companies to encourage adoption of the AWS framework. Barr and Zerter, reflected on the lack of water metrics reported under most frameworks and emphasised that a water-specific framework is required to encourage better adoption of useful metrics (Barr and Zerter, 2021).

It is also recommended that leveraging collaborative partnerships for knowledge sharing and resource optimisation should be strongly considered. Examples include recognition and rewards, materiality assessment and data collection and policies.

Features of the AWS framework aligns best with the concept of international reporting standards, and wider adoption would help in addressing water stewardship comprehensively, addressing water governance, balance, quality, and important water-related issues.

Fostering multi-stakeholder partnerships is critical. These partnerships can facilitate knowledge sharing and resource pooling, promoting collective action on water stewardship and ESG reporting. Collaborative partnerships can also enhance stakeholder engagement, drive innovation, and accelerate progress towards water sustainability.

Alternative frameworks are available for instances where the context of water use is not purely corporate (e.g. a city), or where other considerations are required as part of the reporting (e.g. climate change risk). In this case, an alternative framework such as the CWRF can be considered as an option, noting that ongoing maintenance can be an issue. While the recently disbanded TCFD provided a framework for climate risk reporting, it was more inward-looking and perceived as light on water-related reporting metrics; the framework and guidance it has developed to date has been taken over by the IFRS, but companies now appear to be free to pick and choose how they report.

The final recommendation, therefore, is to consider the level of backing and long-term prospects of the organisation responsible for developing the respective framework, and whether this is voluntary, mandatory, or predicated on a set of circumstances that may change in the future (unlike, for example, the principles of transparency, collaboration, and accountability).

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Appendix A

Reporting Framework Tables and Quotes

Due to the differences in the format of ESG reporting framework, figures and tables are both used in Appendix A to convey the format. When tables are used to summarise the framework, it includes content relevant to discussions above quoted from the framework.

A.1 BRSR: Business Responsibility and Sustainability Report

Appendix Figure 1: Water reporting format and metrics in BRSR

Parameter	FY ____ *(Current Financial Year)*	FY _____ *(Previous Financial Year)*
Water withdrawal by source (in kilolitres)		
(i) Surface water		
(ii) Groundwater		
(iii) Third party water		
(iv) Seawater / desalinated water		
(v) Others		
Total volume of water withdrawal (in kilolitres) (i + ii + iii + iv + v)		
Total volume of water consumption (in kilolitres)		
Water intensity per rupee of turnover (Total water consumption / Revenue from operations)		
Water intensity per rupee of turnover adjusted for Purchasing Power Parity (PPP) (Total water consumption / Revenue from operations adjusted for PPP)		
Water intensity in terms of physical output		
Water intensity *(optional)* – the relevant metric may be selected by the entity		

Note: Indicate if any independent assessment/ evaluation/assurance has been carried out by an external agency? (Y/N) If yes, name of the external agency.

Parameter	FY ____ *(Current Financial Year)*	FY _____ *(Previous Financial Year)*
Water discharge by destination and level of treatment (in kilolitres)		
(i) To Surface water		
- No treatment		
- With treatment – please specify level of treatment		
(ii) To Groundwater		
- No treatment		
- With treatment – please specify level of treatment		
(iii) To Seawater		
- No treatment		
- With treatment – please specify level of treatment		
(iv) Sent to third-parties		
- No treatment		
- With treatment – please specify level of treatment		
(v) Others		
- No treatment		
- With treatment – please specify level of treatment		
Total water discharged (in kilolitres)		

Note: Indicate if any independent assessment/ evaluation/assurance has been carried out by an external agency? (Y/N) If yes, name of the external agency.

A.2 CII: Water Neutrality Framework

Table 5.1: Components under Water Neutral/Positive status companies

Certification	Scope	Components
Water Neutral/Positive Aspiring Company **Focus: Operational efficiency gains maximization**	Scope I Defining real water resource offsets covering both quantity and quality offsets (based on direct or real water used for plant operations)	i. Measure water consumption – direct or real ii. Maximize (operational efficiency) through 3M7R approach. iii. Define direct/ real water resource offset. iv. Map and delineate plant's watershed. v. Measure quality of operational water use and treated wastewater used for disposal to ecosystem vi. Measure quality of receiving ecosystem and compare with treated wastewater quality from the plant. vii. Compare quality of receiving ecosystem regarding its designated best use and define water quality offset.
Water (Neutral/Positive) Rising Plant Company **Focus: Operational sustainability including gaps in offsets, supply chains**	Scope II	i. Map and characterize hydrological and hydrogeological variables for watersheds (plant as well as key water intensive supply chains). ii. Identify water critical supply chains iii. Estimate Virtual Water Use iv. Define combined offset (Direct water + Virtual Water) v. Identify strategies to balance combined offset in plant and supply chain watersheds vi. Measure quality of operational water use and treated wastewater used for disposal to ecosystem (direct plant water) vii. Measure quality of receiving ecosystem before and after operational water use and treated wastewater generation of the plant. viii. Compare quality of receiving ecosystem regarding its designated best use ix. Define quality offset (is it met or not for every intervention which is used for calculation of water status as defined in Governing Equation 2. x. Identify strategies to balance the quality as well as quantity offset (note: if receiving ecosystem is of better quality than your treated wastewater, ensure that treatment at least compares with the quality of existing ecosystem)
Water (Neutral/Positive) Achieved Company	Scope III	Validation, Monitoring and Verifications of strategies undertaken and implemented. This will ensure: i. Monitoring and verification systems

Focus: Validation, Verification and Reporting	ii. iii. iv. v.	Reporting systems Source diversification is established Total reduction in freshwater consumption is established Ecosystem health is established

Water neutrality analysis needs to be undertaken using water company data for both capturing the annual average as well as critical periods especially if frequented by droughts.

This certification process will help companies and organizations to better manage their water usage and reduce their impact on water resources along with promoting environmental sustainability and ecosystem health by ensuring that the amount of water used is balanced with the amount of water replenished. Refer to Figure 5.1 for schematic on step wise approach.

Minimum requirements and qualifications for agencies who can assess, audit and certify water neutrality

- Non-Governmental Organizations (NGOs), autonomous bodies or consulting firms of repute having worked in the water resources sector not less than for a period of 15 years could be employed for the purpose of assessing, auditing and certifying water neutrality.
- The assessing, auditing and certifying team should have qualified personnel possessing a B.Tech./B.E. in Civil, Chemical, Mechanical Engineering or Post Graduation in Water Resources, Environmental Sciences, or allied subjects.

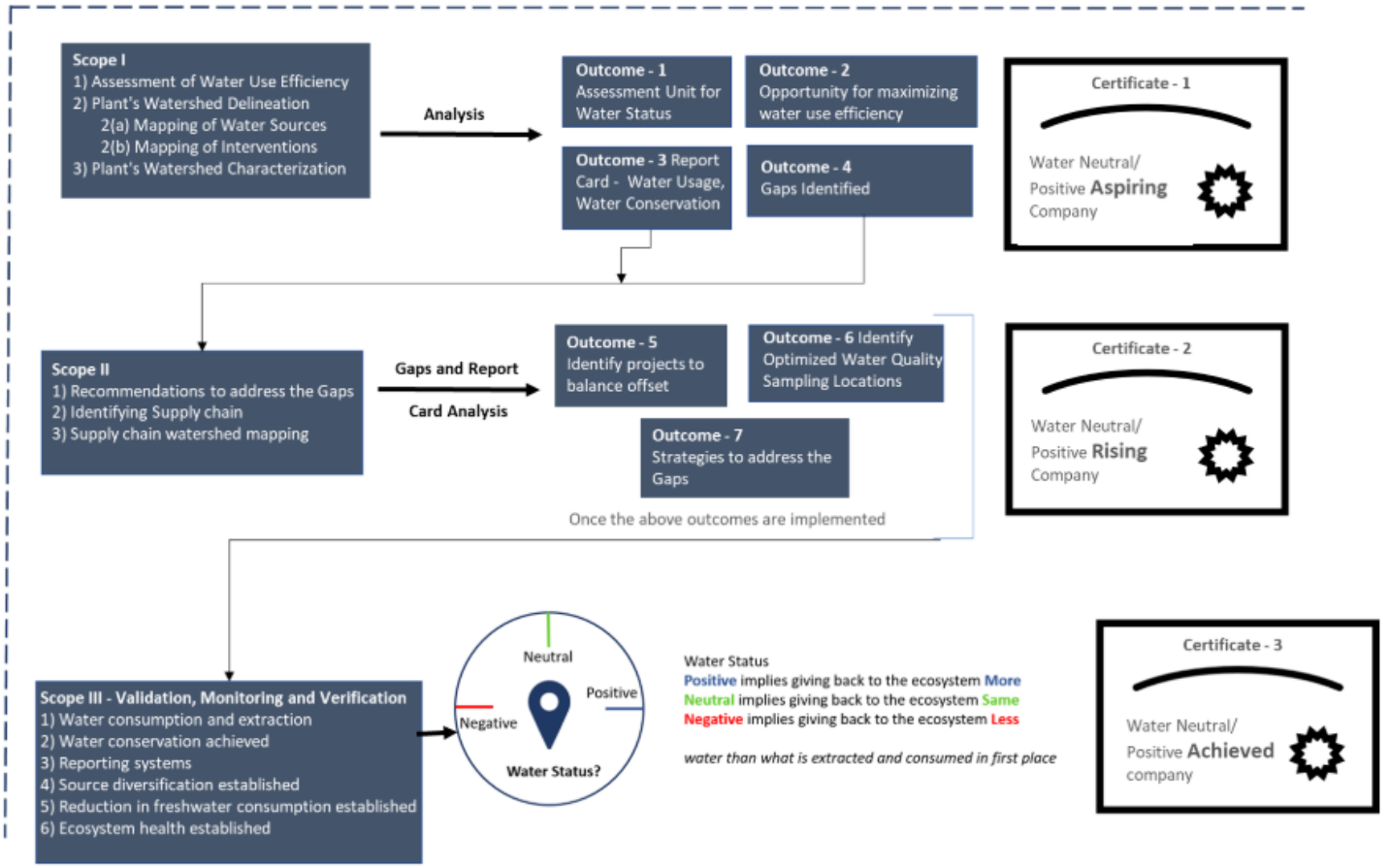
Specific Approach

Scope I
1) Measure water consumption – real
2) Maximize (operational efficiency) through 3M7R approach
3) Compare with water consumption
4) Define real water resource offset
5) Map watersheds – plant

Scope II
6) Map and characterize hydrological and hydrogeological variables for watersheds (plant and supply chain)
7) Identify strategies to balance offset both in plant and supply chain watersheds
8) Measure quality of operational water use and treated wastewater
9) Measure quality of receiving ecosystem before and after operational water use and treated wastewater generation of the plant
10) Compare quality of receiving ecosystem with regard to its designated best use
11) Define quality offset
12) Identify strategies to balance the quality offset with regard to operations (i.e., if receiving ecosystem is of better quality than your treated wastewater, ensure that treatment atleast compares with the quality of existing ecosystem)

Scope III
13) Monitoring and verification system
14) Reporting systems
15) Source diversification
16) Reduction in freshwater consumption

Mapping, Measuring, Monitoring, and Documentation



A.3 AWS: Alliance for Water Stewardship

Appendix Table 1 Definition of water-related terminology in AWS 2.0 Standard

Terminology	Definition
Water Use.	Water used by the site for any purpose. It is important to distinguish the different concepts of total and net water use. Total water use (or total water withdrawal) is the total amount of incoming water supply. However, a proportion of this water is usually returned to the local or regional water cycle. Water may be returned as irrigation losses or where wastewater is treated to a high quality and returned to a nearby water body. This can offset some of the impact of the original water abstractions. Net water use is the amount that is not returned locally. Losses may be from evapotranspiration (in agriculture), evaporative losses from cooling systems or reservoirs, or water that leaves a manufacturing site in finished product. Net water use is the most important for considering impacts within the catchment, and often significantly less than total use.
Efficiency	Water efficiency is the concept of using less net water for an equivalent purpose or volume of production. For example, using less water to produce the same weight of final product (measured in l/kg or m3/kg produced). It may not result in using less total water if the volume of product is increasing. Methods to improve water efficiency include: technology (e.g. drip irrigation), leakage reduction, re-use and recycling of wastewater.

A.4 CDP: The Carbon Disclosure Project

Appendix Table 2 Summary of CDP water-metrics related questions

Question	Description
W1.2	Following data are required to be reported indicating the percentage of facilities they represented. If any information cannot be provided, explanation is required. Water withdrawals – volumes by source [METALS & MINING and COAL SECTORS ONLY] Entrained water associated with your metals & mining and/or coal sector activities - total volume [OIL & GAS SECTOR ONLY] Produced water associated with your oil & gas sector activities - total volume Water withdrawals quality Water discharges – total volume Water discharges – volumes by destination Water discharges – volumes by treatment method Water discharge quality – by standard effluent parameters Water discharge quality – emissions to water (nitrates, phosphates, pesticides, and/or other priority substances) Water discharge quality – temperature Water consumption – total volume Water recycled/reused
W1.3	Water intensity – also defined as total water withdrawal efficiency. Water intensity (W1.3) Provide a figure for your organization's total water withdrawal efficiency. Change from last year No change Rationale A water withdrawal efficiency metric enables companies to track the water-dependency of their revenue, as well as bench mark their water use. Awareness of water efficiency can drive cost savings, increased brand value, and product or service innovation. This metric helps data users track a company's transition towards a water secure future. Connection to other frameworks *SDG* Goal 6: Clean water and sanitation Response options Please complete the following table:

Revenue	Total water withdrawal volume (megaliters)	Total water withdrawal efficiency	Anticipated forward trend
Numerical field [enter a number from 0-999,999,999,999,999 using a maximum of two decimal places]	Numerical field [enter a number from 0-999,999,999,999 using a maximum of two decimal places]	[Auto-calculated]	Text field [maximum of 500 characters]

Water intensity (SW)

(SW3.1) Provide any available water intensity values for your organization's products or services.

Change from last year
No change

Rationale
Methodologies for calculating and reporting water intensity are currently becoming more standardized, particularly with the development of ISO 14046. CDP supply chain members are increasingly interested in the water use of their purchased products (goods or services). In particular, they are interested in the water intensity of the goods and services they purchase that are produced in facilities exposed to water risk (where that risk is related to access to water or physical scarcity).

Response Options
Please complete the following table. You are able to add rows to this table using the "Add Row" button at the bottom of the table.

1	2	3	4	5
Product name	**Water intensity value**	**Numerator: Water aspect**	**Denominator**	**Comment**
Text field [maximum 500 characters]	Numerical field [up to 999,999,999,999 using a maximum of four decimal places]	Select from: • Water withdrawn • Water consumed • Other, please specify	Text field [maximum 100 characters]	Text field [maximum 1,000 characters]

A.5 ESRS: European Sustainability Reporting Standards

Appendix Table 3 Summary of ESRS E3 reporting standard.

Disclosure Requirement	Description of requirement
Related to ESRS 2 IRO-1	Describe processes to identify and assess material water and marine resources-related impacts, risks, and opportunities (IRO) (which leads to IRO to upstream and downstream value chain)
E3-1	Policies implemented to manage the above
E3-2	Actions to achieve the above policies' objectives and allocate to the mitigation hierarchy: avoid, reduce, or restore use of water and marine resources. Specification to areas at water risk/high water stress required.
E3-3	Targets adopted to support policies and address IRO, such as reduction of water consumption, withdrawals, and discharges, ecological thresholds, and others.
E3-4	Metrics 1. Total Water consumption 2. Total water recycled and reused in m3 3. total water stored and changes in storage in m3 4. Water intensity: Total water consumption in m3 per net revenue on own operations Metrics 1 and 2 necessitate contextual information such as local basins' water quality and quantity, methodology. Metric 1 requires measurement for area with water risk/high water stress.

A.6 TCFD and IFRS: Climate-related Financial Disclosures and International Financial Reporting Standards

Appendix Table 4 Water-related metrics example in TCFD's Guidance on Metrics, Targets, and Transition Plans (Excerpt of *Table C1 Cross-Industry, Climate-Related Metric).*

Metric category	Example Unit of Measure	Example Metrics associated with water resources
Physical Risks Amount and extent of assets or business activities vulnerable to physical risks	Amount or percentage	Revenue associated with water withdrawn and consumed in regions of high or extremely high baseline water stress Proportion of property, infrastructure, or other alternative asset portfolios in an area subject to flooding, heat stress, or water stress