

Embedding Environmental, Social and Governance (ESG) Principles in Public Water Utilities for Public Health and Climate-Resilient Development: The NWSC Experience in Uganda

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Abstract

Background: Public water utilities influence public health through safe water supply, sanitation, wastewater management, environmental protection, and inclusive service delivery. Environmental, Social and Governance (ESG) principles provide a useful framework for examining how such utilities integrate sustainability, social responsibility, and institutional accountability. **Objective:** This paper examines how the National Water and Sewerage Corporation (NWSC) embeds ESG principles to advance inclusive and climate-resilient development in Uganda.

Methods: A qualitative institutional case study and policy analysis approach was used. Data were drawn from NWSC integrated annual reports, corporate governance frameworks, environmental management programmes, institutional publications, sector reports, and observational insights from programme implementation between 2022 and 2025. A descriptive analysis was conducted around the environmental, social, and governance pillars.

Results: NWSC's ESG-related practices include water source protection, tree planting, wastewater treatment, non-revenue water reduction, occupational health and safety, workforce development, community outreach, equitable service expansion, audited annual reporting, performance management, and structured corporate governance. Reported programme outputs include service provision in over 270 towns, service to about 18 million people, installation of more than 21,600 public standpipes, planting of more than 5.8 million trees, and wastewater treatment capacity of about 45,000 m³/day at Lubigi.

Conclusion: The NWSC experience demonstrates that ESG can be applied as a public-sector governance framework for strengthening environmental health, social inclusion, accountability, and climate-resilient water service delivery.

Keywords

Environmental, Social and Governance, Public Health, Water Utilities, Environmental Health, Climate Resilience, Water Governance, Uganda, NWSC

Introduction

Access to safe water, sanitation, hygiene, wastewater management, and resilient water infrastructure is central to public health and sustainable development. Water utilities do not only provide a technical service; they also influence disease prevention, environmental health, household welfare, urban resilience, social

equity, and public trust. Sustainable Development Goal 6 calls for the availability and sustainable management of water and sanitation for all, while public health frameworks continue to emphasize the relationship between water, sanitation, hygiene, environmental protection, and population wellbeing [1,2].

Environmental, Social and Governance (ESG) principles have become increasingly important in assessing how institutions manage sustainability, social responsibility, and accountability. Although ESG has often been associated with private-sector investment, listed companies, and financial disclosure, its underlying principles are directly relevant to public institutions responsible for essential services. Public water utilities operate at the intersection of environmental stewardship, social welfare, and governance accountability. Their decisions affect water source protection, climate adaptation, affordability, service equity, occupational safety, wastewater treatment, and institutional transparency.

In Uganda, the National Water and Sewerage Corporation (NWSC) is a public water utility responsible for water supply and sewerage services across multiple towns and municipalities. Its mandate requires balancing commercial sustainability and operational efficiency with public health obligations, social inclusion, environmental protection, and accountability to government, customers, employees, regulators, communities, and development partners. In this context, ESG provides a useful framework for examining how a public utility can align institutional performance with environmental health and inclusive development outcomes.

This paper builds on the conference presentation delivered during Uganda Water and Environment Week 2026 under the title “Embedding Environmental, Social and Governance (ESG) Principles in Public Water Utilities: The NWSC Experience in Advancing Inclusive and Climate-Resilient Development in Uganda.” It develops the presentation into a manuscript suitable for public health and epidemiology audiences by emphasizing the connection between ESG, water service delivery, environmental health, climate resilience, and population wellbeing.

Objectives

The study was guided by the following objectives:

1. To examine how ESG principles are operationalized within a public water utility context.
2. To assess the contribution of ESG-aligned practices to environmental sustainability, social inclusion, public health, and governance effectiveness at NWSC.
3. To document lessons on the applicability of ESG as a governance framework for public utilities in developing-country contexts.

Materials and Methods

Study Design

The study adopted a qualitative institutional case study and policy analysis approach. This design was appropriate because the paper sought to document and interpret institutional practices rather than test a clinical intervention or conduct population-level epidemiological measurement. The case study approach enabled the analysis of ESG implementation within the real-world operations of a public water utility.

Study Setting

The case study focused on the National Water and Sewerage Corporation in Uganda. NWSC provides water and sewerage services in over 270 towns and municipalities and operates within a public-sector governance environment that requires service delivery, operational accountability, environmental compliance,

and stakeholder engagement. The study examined ESG practices embedded in NWSC’s environmental programmes, social initiatives, and governance systems.

Data Sources

Data were obtained through document review, institutional reports, policy analysis, and observational insights derived from implementation of NWSC programmes between 2022 and 2025. Documentary sources included NWSC Integrated Annual Reports, corporate governance frameworks, environmental management programme records, institutional publications, sector reports, and programme documentation relating to environmental management, workforce development, community engagement, and service delivery.

Analytical Approach

A descriptive qualitative analysis was conducted using the three ESG pillars as the organising framework. Institutional practices were grouped under environmental, social, and governance categories. The analysis then examined how these practices contribute to environmental protection, social welfare, public health, climate resilience, service inclusion, and institutional accountability. Programme outputs reported in NWSC records and the conference poster were summarized descriptively.

Ethical Considerations

This paper is based on institutional documents, published reports, programme records, and professional observations. It does not report identifiable personal health information, individual patient data, or human-subject clinical research. Where future studies seek to measure household, employee, community, or customer-level impacts, appropriate ethical approval and informed consent procedures should be applied.

Results

Environmental Pillar: Environmental Protection and Climate Resilience

NWSC’s environmental pillar is reflected in water source protection, environmental compliance, catchment management, tree planting, wastewater treatment, resource efficiency, and climate-resilient infrastructure planning. In the water sector, environmental management has direct public health relevance because water source degradation, inadequate wastewater treatment, pollution, and climate-related water stress can affect water quality, service reliability, disease risk, and ecosystem sustainability.

The programme records reviewed indicate that NWSC has planted more than 5.8 million trees through environmental conservation and catchment protection programmes. The corporation has also implemented wastewater treatment infrastructure, including the Lubigi wastewater treatment plant with reported treatment capacity of approximately 45,000 m³/day. In addition, non-revenue water reduction has been identified as an important resource efficiency measure, with records indicating a reduction from levels above 60% to approximately 32%.

These environmental actions demonstrate how a water utility can contribute to climate-resilient service delivery and environmental health. Catchment protection and tree planting support water security and ecosystem protection, while wastewater treatment and resource efficiency contribute to pollution control and sustainable water management.

Social Pillar: Inclusive Access, Occupational Health and Community Welfare

The social pillar is reflected in NWSC's service expansion, equitable access initiatives, workforce development, occupational health and safety systems, gender and youth inclusion, community outreach, sanitation campaigns, and customer engagement platforms. For a public water utility, social performance is inseparable from public health because safe water and sanitation services influence hygiene, disease prevention, dignity, productivity, and household welfare.

The reviewed records indicate that NWSC provides services to about 18 million people and operates in over 270 towns. The installation of more than 21,600 public standpipes is particularly relevant to social inclusion because standpipes can extend access to communities and households that may not have individual connections. Community outreach activities, including school programmes, sanitation campaigns, water conservation education, and customer engagement, further support responsible water use and public awareness.

Workforce development also forms part of the social pillar. NWSC employs more than 3,000 staff across its operational areas and has invested in human capital development to strengthen service delivery. Occupational health and safety systems are important in water utilities because employees may face risks associated with construction, water treatment, wastewater handling, field operations, confined spaces, chemicals, transport, and emergency response.

Governance Pillar: Accountability, Transparency and Institutional Performance

The governance pillar is reflected in NWSC's corporate governance structures, board oversight, executive management, internal audit mechanisms, performance monitoring, regulatory compliance, public reporting, and stakeholder accountability. Governance is particularly important in public utilities because water and sanitation services are essential services that require public trust, financial stewardship, service reliability, and accountability for results.

The reviewed documents indicate that NWSC publishes annual reports that are audited by the Auditor General. This strengthens transparency and public accountability. The corporation also applies performance improvement mechanisms, including SCAP100 performance programmes, to support service delivery, internal accountability, and operational efficiency. Such governance practices contribute to the institutional conditions required for safe, reliable, and inclusive water and sanitation services.

In the public health context, governance failures in water utilities can contribute to service interruptions, poor water quality management, inadequate sanitation, environmental degradation, inequitable access, and reduced public confidence. Conversely, strong governance supports resilience, compliance, transparency, and long-term sustainability.

Summary of Key Outputs

Table 1: Summary of documented SWAS Clubs programme outputs

ESG pillar	Indicator	Reported output
Environmental	Tree planting and catchment protection	More than 5.8 million trees planted under environmental conservation programmes.
Environmental	Wastewater treatment	Lubigi wastewater treatment plant reported at approximately 45,000 m ³ /day treatment capacity.
Environmental	Resource efficiency	Non-revenue water reportedly reduced from above 60% to approximately 32%.
Social	Population served	About 18 million people served through NWSC water and sewerage services.
Social	Public standpipes	More than 21,600 public standpipes installed to support service access.
Social	Workforce	More than 3,000 employees supporting operations across NWSC service areas.
Governance	Towns served	Over 270 towns and municipalities served.
Governance	Accountability	Annual reports audited by the Auditor General.
Governance	Performance management	SCAP100 and related institutional performance improvement initiatives.

Discussion

The findings show that ESG can be applied as a public-sector governance framework for water utilities. Although ESG is frequently discussed in investment and private-sector contexts, the NWSC experience illustrates that the same pillars can be used to examine essential public services that directly affect public health and environmental outcomes. In public water utilities, environmental protection, social welfare, and governance account-

ability are not abstract concepts; they are practical conditions for safe, reliable, inclusive, and climate-resilient service delivery.

The environmental pillar is closely linked to environmental health. Water source protection, tree planting, catchment management, wastewater treatment, and resource efficiency help reduce risks associated with pollution, water scarcity, ecosystem degradation, and climate vulnerability. For Uganda and other

developing-country contexts, climate-related pressures on water resources make it important for water utilities to integrate resilience into infrastructure planning, operational management, and community engagement.

The social pillar demonstrates the public health role of water utilities. Water and sanitation access affect hygiene, disease prevention, household dignity, school attendance, gender equity, and economic participation. The reported service reach, public standpipes, community campaigns, and workforce programmes show that public utilities contribute to social welfare in ways that extend beyond direct water production and billing. Public standpipes, in particular, are relevant for communities where household connections may be unaffordable or technically difficult, although future evaluation should assess service quality, reliability, affordability, and user experience at community level.

The governance pillar reinforces the importance of accountability in public health infrastructure. Transparent reporting, audited accounts, performance management, board oversight, and compliance mechanisms can improve public confidence and strengthen institutional sustainability. Public utilities operate in high-trust environments because communities depend on them for essential services. Weak governance can undermine water quality, sanitation, financial sustainability, and equitable access,

while strong governance can improve service reliability, stakeholder trust, and resilience.

A major contribution of the NWSC experience is that it links ESG to real operational areas within a public utility. Rather than treating ESG as a reporting label, the case shows how ESG can be interpreted through catchment protection, wastewater treatment, community access, employee welfare, customer engagement, audited reporting, and performance management. This provides a practical model for other public utilities seeking to translate sustainability principles into institutional action.

However, the study also shows the need for stronger impact measurement. The available evidence largely documents institutional outputs such as trees planted, people served, towns covered, standpipes installed, staff employed, and performance systems implemented. These are useful indicators of scale and institutional effort, but they do not fully measure public health impact, environmental quality, customer outcomes, or climate resilience. Future research should include mixed-method evaluations linking ESG practices to measurable outcomes such as water service reliability, water quality indicators, sanitation access, customer satisfaction, occupational safety incidents, wastewater compliance, environmental restoration outcomes, and equity in service provision.

Table 2: Public health relevance of ESG integration in a public water utility

ESG dimension	Public health relevance	Potential future measurement areas
Environmental	Protects water sources, reduces pollution risk, supports wastewater management, and strengthens climate resilience.	Water quality, wastewater compliance, catchment status, climate disruption impacts, resource efficiency.
Social	Improves access to safe water and sanitation, supports hygiene promotion, employee welfare, and community wellbeing.	Service equity, affordability, reliability, customer satisfaction, hygiene behaviour, occupational safety.
Governance	Strengthens accountability, transparency, compliance, and institutional performance for essential services.	Audit outcomes, regulatory compliance, service standards, complaint resolution, performance indicators.

Policy and Practice Implications

The NWSC experience offers several lessons for public utilities and policymakers. First, ESG should not be viewed only as a private-sector reporting requirement; it can also serve as a practical governance framework for public institutions responsible for essential services. Second, public health outcomes in water and sanitation depend on environmental protection, social inclusion, and governance effectiveness operating together. Third, ESG reporting by public utilities should include both institutional outputs and outcome indicators that show how utility performance affects people, ecosystems, and resilience. Fourth, water utilities should institutionalize stakeholder engagement, public reporting, and climate-resilient planning as part of routine operations rather than standalone initiatives.

Limitations

This study has limitations. It is based on a qualitative institutional case study and therefore does not establish causal relationships between ESG practices and specific public health or epidemiological outcomes. The analysis relies on institutional records, annual reports, programme documentation, and observational insights, which may not capture all community-level perspectives. Some reported figures represent institutional output

indicators and should be interpreted as evidence of programme scale rather than direct measures of health impact. Future research should use mixed methods, independent verification, and longitudinal outcome measurement to assess the public health, environmental, and governance impacts of ESG integration in water utilities.

Conclusion

The NWSC experience demonstrates that Environmental, Social and Governance principles can be meaningfully applied within public water utilities to support public health, social inclusion, environmental protection, and climate-resilient development. By embedding ESG practices into water source protection, wastewater treatment, service expansion, workforce development, community engagement, audited reporting, and performance management, public utilities can strengthen both institutional sustainability and population wellbeing.

The case also shows that ESG should be understood as a practical governance framework rather than a private-sector concept alone. For public water and sanitation institutions, ESG integration can help align service delivery with sustainable development, public accountability, and climate resilience. Future

research should strengthen the evidence base by measuring the long-term public health, environmental, social, and governance outcomes of ESG-aligned water utility practices.

Declarations

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Competing Interests

The author is an employee of the National Water and Sewerage Corporation, the institution discussed in this manuscript. This affiliation is disclosed. The author declares no other competing interests.

Author Contribution

Brownie Ebal conceptualized the study, reviewed the institutional records, conducted the descriptive analysis, and prepared the manuscript.

Data Availability

The data summarized in this manuscript are drawn from NWSC annual reports, institutional programme records, governance documents, and published materials. Detailed institutional records may be available from NWSC subject to internal approval and applicable data governance requirements.

Ethics Statement

This manuscript reports an institutional case study and does not include identifiable personal health information or individual human-subject research. Future studies involving individu-

al-level data should obtain appropriate ethics approval and informed consent.

References

1. United Nations. Transforming our world: the 2030 Agenda for Sustainable Development. New York: United Nations; 2015.
2. World Health Organization, United Nations Children's Fund. Progress on household drinking water, sanitation and hygiene 2000-2024: special focus on inequalities. Geneva and New York: WHO and UNICEF; 2025.
3. United Nations. Goal 6: ensure access to water and sanitation for all. New York: United Nations; 2026.
4. UN-Water. Sustainable Development Goal 6 Synthesis Report 2018 on Water and Sanitation. Geneva: United Nations; 2018.
5. Organisation for Economic Co-operation and Development. OECD Principles on Water Governance. Paris: OECD; 2015.
6. Global Reporting Initiative. GRI 1: Foundation 2021. Amsterdam: GRI; 2021.
7. Global Reporting Initiative. GRI 2: General Disclosures 2021. Amsterdam: GRI; 2021.
8. Global Reporting Initiative. GRI 3: Material Topics 2021. Amsterdam: GRI; 2021.
9. International Organization for Standardization. ISO 26000:2010 Guidance on social responsibility. Geneva: ISO; 2010.
10. National Water and Sewerage Corporation. Integrated Annual Report FY 2022/2023. Kampala: NWSC; 2023.
11. National Water and Sewerage Corporation. Integrated Annual Report FY 2023/2024. Kampala: NWSC; 2024.
12. National Water and Sewerage Corporation. Embedding Environmental, Social and Governance (ESG) Principles in Public Water Utilities: the NWSC Experience
13. Advancing Inclusive and Climate-Resilient Development in Uganda. Conference paper presented at Uganda Water and Environment Week 2026; Kampala, Uganda; 2026.