

An Implementation Model for Assurance on Sustainability Reports in Iran in Conformity with International Standard on Sustainability Assurance 5000

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ABSTRACT

The purpose of this study was to identify and explain the components of assurance on sustainability reports in Iran based on International Standard on Sustainability Assurance 5000 (ISSA 5000). The study adopted a qualitative approach and thematic analysis and was conducted in two documentary and field phases. Documentary data were collected through the review of 20 selected sources, including standards, professional guidance, corporate reports, and scientific studies. Field data were obtained through semi-structured interviews with eight experts holding postgraduate qualifications and relevant professional experience, selected through purposive sampling. Data were analyzed using a combined deductive and inductive logic and were organized through a thematic network. The findings comprised 5 global themes, 26 organizing themes, and 134 basic themes. The global themes encompassed the institutional and regulatory context, organizational governance and information readiness, professional quality and engagement design, performance of assurance procedures and evaluation of evidence, and independent reporting and improvement. The findings indicate that consistent implementation of sustainability assurance depends on institutional coordination, management accountability, data traceability, professional independence and competence, and consistency among the scope, evidence, and conclusion. Contextualization also requires the design of implementation arrangements suited to Iranian conditions while preserving the requirements of the Standard. The principal contribution of the study is the development of an interconnected network of components that can support the preparation of professional guidance, assessment of corporate readiness, and development of sustainability assurance capacity in Iran.

Keywords: sustainability reporting, sustainability reporting assurance, ISSA 5000, thematic analysis.

Introduction

Sustainability reporting has evolved from a largely voluntary communication practice into an increasingly institutionalized mechanism through which organizations are expected to explain their economic, environmental, social, and governance impacts to investors, regulators, employees, customers, and other stakeholders. This transition reflects a broader transformation in corporate accountability, in which conventional financial reporting is



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no longer considered sufficient for evaluating organizational performance, long-term resilience, exposure to nonfinancial risks, and the distribution of corporate impacts across stakeholder groups. The expansion of environmental, social, and governance (ESG) considerations in corporate finance, investment analysis, governance, and regulatory policy has reinforced expectations that firms provide decision-useful sustainability information alongside traditional financial statements (1, 2). At the same time, the development of sustainability-related reporting standards has intensified concerns about the reliability, comparability, completeness, and verifiability of disclosed information, because wider disclosure without adequate quality controls may increase rather than reduce information asymmetry. Economic analyses of mandatory and voluntary sustainability reporting further suggest that standardization can generate benefits through enhanced comparability and transparency, but can also impose significant implementation and compliance costs and may produce heterogeneous effects across firms and institutional environments (3). Therefore, the growing importance of sustainability reporting has been accompanied by an equally important question: whether users can place sufficient confidence in the information being reported.

The theoretical foundations of sustainability disclosure help explain why assurance has become central to this debate. Legitimacy theory suggests that organizations disclose social and environmental information partly to maintain alignment with societal expectations and preserve organizational legitimacy, particularly when their activities are subject to public scrutiny (4). From this perspective, sustainability reports may function not only as informational documents but also as instruments of reputation management and legitimacy maintenance. Consequently, the existence of disclosure alone does not guarantee neutrality, completeness, or reliability. Early research on third-party environmental statements warned that external verification could either enhance transparency or become symbolically incorporated into managerial reporting processes without meaningfully strengthening accountability (5). This concern remains important because sustainability information often involves management judgment, estimation uncertainty, incomplete data infrastructures, and qualitative narratives that are more difficult to verify than conventional financial information. Assurance therefore has the potential to reduce credibility gaps, but its effectiveness depends on the independence, competence, scope, methodology, and transparency of the assurance process itself.

Sustainability assurance can broadly be understood as an independent professional engagement designed to increase the degree of confidence of intended users in sustainability information through the performance of procedures and the expression of a conclusion. Its emergence reflects the need to strengthen the credibility of disclosures that increasingly influence investment decisions, stakeholder evaluations, contractual relationships, and regulatory assessments. Empirical evidence has shown that sustainability assurance practices vary substantially across countries, industries, providers, assurance levels, and reporting frameworks (6). Studies of sustainability verification have also demonstrated considerable heterogeneity in the nature of procedures performed, assurance providers used, criteria applied, and reporting formats adopted (7). These variations create challenges for users because apparently similar assurance statements may differ materially in scope and evidential depth. They also create implementation difficulties for organizations and practitioners because the meaning of assurance must be translated into specific responsibilities, controls, documentation requirements, evidence-gathering procedures, and reporting decisions.

The literature has long indicated that the institutional environment strongly shapes whether and how companies obtain external assurance. Comparative evidence from South Africa, for example, showed differences in corporate social responsibility assurance practices and raised questions concerning the credibility and consistency of

assurance among listed companies (8). More recent systematic reviews have confirmed that sustainability assurance remains influenced by the regulatory environment, organizational characteristics, governance structures, practitioner type, stakeholder pressure, and maturity of reporting systems (9). Such findings suggest that an international assurance standard cannot be implemented effectively through simple textual adoption alone. Its requirements must be operationalized within a national context through appropriate institutional responsibilities, professional capacities, data infrastructures, quality-control mechanisms, and implementation guidance.

This issue has become particularly important with the introduction of more formalized sustainability assurance requirements and the increasing convergence of sustainability reporting with mainstream corporate reporting. Research on emerging European requirements shows that practitioners face substantial uncertainty in interpreting new sustainability assurance obligations, particularly with respect to evidence, materiality, scope, organizational readiness, and the interaction between reporting standards and assurance requirements (10). These challenges illustrate a broader implementation problem: assurance quality depends not only on the wording of standards but also on the institutional and organizational conditions necessary for practitioners to apply them consistently. Where responsibilities are fragmented, sustainability data are weakly controlled, or professional expertise is insufficient, formal assurance requirements may produce inconsistent practice. Accordingly, implementation frameworks need to distinguish clearly between reporting criteria, organizational responsibilities, practitioner requirements, and reporting outputs.

Another important dimension is the relationship between sustainability assurance and corporate governance. Governance structures influence the extent and quality of ESG disclosure, and independent boards may moderate the relationship between ownership structure and sustainability reporting behavior (11). Assurance can complement governance by subjecting sustainability information to external scrutiny and by requiring management to clarify responsibility for data generation, internal controls, assumptions, and reporting boundaries. Evidence from India indicates that sustainability assurance may strengthen the relationship between corporate governance and firm performance, suggesting that assurance can function as part of a broader accountability architecture rather than merely as a technical reporting exercise (12). This reinforces the importance of integrating assurance with governance processes, including management accountability, oversight by those charged with governance, internal audit involvement, and responsibility assignment for sustainability metrics.

The relationship between sustainability information and corporate financial decisions further demonstrates why reliable ESG reporting is increasingly consequential. Research has shown that ESG performance can affect financing choices, capital structure, and adjustment behavior, implying that sustainability information may influence decisions about debt, equity, and risk allocation (13). Studies of the interaction between ESG performance, market competition, and capital structure also indicate that environmental and social performance can shape corporate financing behavior under differing competitive conditions (14). At the theoretical level, the growing presence of ESG-sensitive investors has raised the question of whether traditional capital structure propositions remain unchanged when investors value sustainability characteristics in addition to financial risk and return (15). These developments increase the economic significance of the credibility of sustainability information. If ESG-related disclosures affect capital allocation, cost of capital, contracting, or market valuation, then unreliable or inconsistently assured information may lead to inefficient decisions by investors and other users.

The value of assurance is also apparent in interorganizational and market relationships. Experimental and analytical evidence suggests that assurance of corporate social responsibility disclosures can affect perceptions

and decisions in buyer–seller markets, especially when assurance interacts with incentives for real CSR investment (16). This finding highlights an important distinction between merely communicating sustainability claims and establishing the credibility of those claims through independent verification. Assurance may therefore influence not only investor confidence but also supply-chain relationships, contracting, stakeholder trust, and managerial incentives. Yet the usefulness of assurance depends on whether users understand what has actually been assured, what criteria have been applied, the level of assurance obtained, the procedures performed, and the limitations associated with the information.

These issues are amplified by the technical characteristics of sustainability information. Unlike traditional financial information, sustainability disclosures frequently incorporate nonfinancial metrics, engineering estimates, emissions calculations, operational indicators, third-party data, supply-chain information, forward-looking assumptions, and data generated by digital monitoring systems. Studies from specific sustainability domains demonstrate that technical reliability, measurement methodology, and process controls are essential to the credibility of reported sustainability outcomes (17). Consequently, assurance engagements often require multidisciplinary expertise and may depend on specialists in areas such as environmental measurement, climate science, energy, engineering, occupational safety, and information technology. The competence of the engagement team must therefore extend beyond conventional accounting knowledge, while professional judgment remains necessary to determine whether specialist evidence is sufficient and appropriate.

This multidisciplinary requirement has important implications for education and professional capacity. Sustainability assurance introduces concepts and competencies that may not traditionally have been emphasized in audit education, including sustainability reporting frameworks, nonfinancial measurement, climate and environmental data, value-chain information, and assurance over qualitative or forward-looking disclosures. Research on sustainability assurance in auditor education highlights the need to adapt professional training and academic curricula to these emerging competency requirements (18). Without adequate capacity development, the rapid formalization of sustainability assurance could create a gap between regulatory expectations and practitioners' ability to execute engagements consistently. Accordingly, any implementation model must consider not only technical engagement procedures but also the institutional mechanisms required for professional training, qualification, continuing development, and the use of specialists.

Within organizations, internal audit can play an important supporting role in preparing for sustainability assurance. Internal audit consulting and assurance services may contribute to sustainability reporting systems by evaluating data flows, internal controls, reporting processes, governance responsibilities, and readiness for external assurance (19). However, the role of internal audit must remain distinct from that of the independent external assurance practitioner. Management retains responsibility for preparing sustainability information and maintaining appropriate controls, while the independent practitioner is responsible for obtaining evidence and expressing the assurance conclusion. A robust implementation model therefore needs to clarify the complementary but non-substitutable roles of management, internal audit, audit committees, sustainability functions, specialists, and external assurance providers.

In Iran, sustainability reporting and assurance have attracted growing academic and professional attention, but the literature also indicates that implementation remains at a developing stage. Iranian research has emphasized the necessity of preparing and assuring sustainability reports from the perspectives of auditors and industry experts, reflecting recognition that sustainability information requires enhanced credibility and that assurance can strengthen

user confidence (20). A meta-study of Iranian accounting and auditing research on corporate sustainability reporting indicates that the field has expanded, while also revealing fragmentation in research themes and the need for more systematic attention to implementation, institutional arrangements, and professional practice (21). These conditions suggest that the Iranian context requires a framework capable of translating international assurance principles into operational arrangements compatible with domestic regulatory, professional, and organizational characteristics.

Recent Iranian studies have increasingly focused specifically on sustainability reporting assurance. Research on the requirements, challenges, and consequences of sustainability reporting assurance has identified a range of implementation issues relating to professional expertise, data systems, regulation, cost, organizational readiness, and institutional support (22). A systematic review of sustainability assurance models has similarly emphasized the diversity of assurance approaches, implementation challenges, emerging opportunities, and the need to identify best practices that can be adapted to particular institutional contexts (23). Taken together, these studies indicate that the problem is no longer simply whether sustainability reports should be assured; rather, the central issue is how assurance should be implemented in a manner that is technically rigorous, institutionally feasible, professionally credible, and consistent with international requirements.

International research likewise shows that sustainability assurance cannot be reduced to the final assurance statement. It is a process that begins with engagement preconditions and extends through scope definition, criteria assessment, planning, risk assessment, evidence gathering, evaluation of misstatements, conclusion formation, and reporting. Systematic reviews have called for greater attention to the detailed mechanisms through which assurance quality is created and to the factors that influence practitioner decisions throughout the engagement (9). The importance of these mechanisms is reinforced by evidence that assurance practices differ considerably in depth and structure (6). Therefore, a useful implementation model should make the relationships among engagement acceptance, materiality, risk, evidence, quality management, independence, and reporting explicit rather than treating them as isolated requirements.

The distinction between reporting quality and assurance quality is particularly important. High-quality assurance cannot compensate for fundamentally inadequate reporting criteria or poorly prepared underlying data, just as high-quality sustainability reporting does not automatically provide independent credibility. The assurance process requires suitable criteria, identifiable reporting boundaries, accessible supporting evidence, traceable data, appropriate internal controls, and clarity regarding management responsibility. It also requires the practitioner to maintain independence, professional skepticism, competence, and effective quality management. When these conditions are absent, practitioners may face limitations in evidence or uncertainty over the scope of the conclusion. Such issues were already evident in earlier verification research, which documented variation in sustainability assurance practice and the challenges of defining reliable verification procedures (7). They remain central under contemporary sustainability assurance requirements.

In addition, implementation should account for the possibility that formal assurance may become ceremonial unless supported by meaningful institutional accountability. The historical literature on environmental reporting cautions that third-party statements can add value only when the verification process meaningfully challenges management representations rather than becoming embedded in symbolic disclosure practices (5). Legitimacy-based explanations of social and environmental reporting similarly imply that firms may have incentives to emphasize favorable information or use disclosure strategically (4). For this reason, the independence of the

assurance practitioner, the transparency of engagement scope, the clarity of reporting criteria, and the sufficiency and appropriateness of evidence are central safeguards against assurance becoming merely reputational.

At the same time, assurance should not be understood as an isolated compliance cost. Where it is properly designed, it can promote improvements in data governance, control environments, accountability structures, and sustainability management processes. The process of preparing information for independent assurance may force organizations to clarify metric definitions, assign data ownership, document calculation methods, strengthen controls, and improve traceability. It may also identify weaknesses that management can remediate in subsequent reporting periods. In this sense, sustainability assurance can create an iterative relationship between reporting, control, independent evaluation, and organizational learning. This broader perspective is consistent with the view that the economic and governance effects of ESG-related practices depend on how they are embedded within corporate decision-making and accountability systems (1).

The need for a structured implementation model is therefore especially pressing in jurisdictions where sustainability assurance is emerging alongside new reporting requirements. A national implementation framework must preserve the substantive requirements of international standards while specifying how they connect to domestic regulation, institutional authority, practitioner qualification, organizational readiness, technological infrastructure, and quality oversight. It should distinguish mandatory standard requirements from engagement-specific conditions and context-based recommendations. It should also produce assessable outputs, such as responsibility matrices, scope documentation, metric specifications, risk-assessment records, evidence summaries, and reporting decisions. Such an approach can help prevent ambiguity in implementation and support consistency across practitioners and reporting entities.

Accordingly, the aim of this study is to develop and explain an operational model for assurance on sustainability reports in Iran that is aligned with International Standard on Sustainability Assurance 5000 and adapted to the institutional, professional, organizational, and informational conditions of the Iranian context.

Methods and Materials

The present study is applied and developmental in terms of purpose and exploratory, descriptive, and analytical in nature. It employed a qualitative approach based on thematic analysis and was conducted in two complementary documentary and field phases. In the documentary phase, the research population consisted of professional standards and guidance, corporate reports and independent assurance reports, and scientific studies related to the implementation of sustainability assurance. Sources were selected using criterion-based purposive sampling. The criteria for document inclusion comprised authenticity and verifiability of the issuing source, direct relevance to the research questions, clarity regarding the version and authoritative status of the document, accessibility of citable content, and the possibility of identifying the scope, period, and level of assurance. Diversity in industry, institutional environment, reporting criteria, and type of assurance practitioner was also taken into account when selecting corporate reports, while duplicate sources were excluded. The documentary corpus comprised 20 principal sources, including 12 standards and professional guidance documents, six corporate and independent assurance reports, and two relevant scientific articles. The final version of International Standard on Sustainability Assurance 5000 served as the principal reference for the analysis. In the field phase, the expert population included partners and managers of public and private audit firms, senior auditors, specialists from regulatory and standard-setting bodies, sustainability, corporate governance, and internal audit managers and experts, as well as faculty members and

relevant researchers. Participants were selected using heterogeneous purposive sampling supplemented by chain-referral identification of experts. Selection criteria included specialized knowledge and relevant experience, familiarity with sustainability reporting and assurance, and the ability to evaluate the implementation requirements of the Iranian context. In total, eight experts were interviewed; all held master's or doctoral degrees and had at least 10 years of professional experience.

Documentary data were collected through systematic review of the selected sources and recording of relevant characteristics and evidence in a data-extraction form. When corporate reports were reviewed, the independent assurance report was analyzed together with the information explicitly covered by that report in order to interpret the scope of procedures and basis for the conclusion accurately. Field data were collected through semi-structured interviews using an interview guide developed from the documentary findings. The interview topics included evaluation of the preliminary framework, allocation of responsibilities among actors, professional competence and independence, data readiness and internal controls, evidence-gathering procedures, and institutional, professional, technical, and organizational barriers. The open-ended structure of the questions enabled experts to express critical views and supplementary recommendations. Data analysis was conducted using a combined deductive and inductive logic. In the deductive component, the requirements of ISSA 5000 guided the identification of professional components and stages of engagement performance, whereas in the inductive component, supplementary concepts and contextual requirements were extracted from the documents and expert responses. The unit of analysis was a statement or coherent textual segment expressing an independent meaning concerning an assurance responsibility, activity, prerequisite, or output. Following repeated reading of the data, meaning units were coded, and codes sharing semantic similarities were organized into basic themes while conceptual distinctions were preserved. The basic themes were subsequently consolidated into organizing themes, and the relationships among them formed the basis for developing global themes and the conceptual network of the study. During refinement of the structure, the consistency of themes with the evidence, clarity of conceptual boundaries, and relationship between documentary and field findings were examined. To preserve auditability and traceability of the analysis, the sources of evidence, coding definitions, and reasons for merging or separating concepts were documented. A distinction was also maintained among requirements derived from the Standard, practices observed in reports, and contextual recommendations proposed by experts so that the basis of each component remained explicit in the final interpretation.

Findings and Results

In the documentary qualitative phase of the study, the objective was to extract the requirements and preliminary components of an implementation model for sustainability reporting assurance and to establish an evidence-based foundation for its contextualization in Iran. To achieve this objective, the sources were selected to cover three complementary levels:

First, standards and professional documents were examined to identify assurance requirements and reporting criteria.

Second, actual assurance reports were examined to determine how these requirements are reflected in professional practice.

Third, relevant scientific studies were reviewed to identify institutional and professional factors affecting the implementation of sustainability assurance.

Accordingly, a set of 20 principal sources, consisting of 12 standards and professional guidance documents, six corporate and independent assurance reports, and two relevant scientific articles, was selected to constitute the initial corpus for documentary analysis. This corpus served as the basis for extracting the preliminary model framework and developing the themes of the expert interviews. The central reference for the analysis was the final version of International Standard on Sustainability Assurance 5000, issued in November 2024. Corporate examples were selected in light of the broad scope of the Standard and its applicability to different sustainability subject matters, diverse reporting frameworks, and both professional accountant and non-accountant assurance practitioners. Accordingly, the selected examples covered the extractive industries, consumer goods, information technology, financial services, trading activities, and energy, enabling the general requirements of assurance implementation to be examined together with differences arising from the nature of the activities and professional environments. The criteria for selecting and including documents in the analytical corpus were as follows:

1. **Authenticity and verifiability of document origin:** Standards and guidance documents had to be attributable to the issuing body, while corporate reports had to be attributable to the reporting entity or assurance practitioner. For scientific articles, author information, journal, year of publication, and digital identifier were verified.
2. **Direct relevance to the research objective:** The document had to provide usable information concerning assurance engagement requirements, reporting criteria, responsibilities of the parties, professional competence, independence, quality management, evidence gathering, or the structure of the independent assurance report.
3. **Clarity regarding the version and authoritative status of the document:** The final version of standards, non-authoritative guidance, reporting frameworks, and scientific articles were recorded together with their status. The year of issuance or approval was distinguished from the effective date.
4. **Accessibility of relevant and citable content:** Inclusion of corporate reports required access to the independent assurance report or a clearly identifiable assurance section so that the scope of the engagement, criteria applied, level of assurance, and practitioner's conclusion could be examined.
5. **Purposeful diversity in sample characteristics:** Differences in industry, geographical and regulatory environment, type of practitioner, reporting criteria, and assurance scope were considered in the selection of corporate reports. Such diversity was necessary for analytical comparison of practices and identification of both common and context-dependent components.
6. **Ability to identify the reporting period and boundaries of information coverage:** The year stated in the report title, performance period, date of the independent assurance report, and period covered by the metrics subject to assurance were recorded separately because these dates are not necessarily identical.
7. **Avoidance of duplication in documents and evidence:** Duplicate versions, identical translations, and republications without additional content were not treated as independent sources. The original or most authoritative version was used as the basis for citation and coding.

Documents were selected using criterion-based purposive sampling with attention to maximum relevant variation. In the empirical component, the unit of selection was the “assurance report together with the information explicitly covered by that report.” Therefore, corporate reputation or the comprehensiveness of a sustainability report alone was not sufficient for inclusion of a sample. Scientific sources and practical reports were used to interpret and

understand implementation practices, and the origin of each component—as a standard requirement, professional guidance, observed practice, or researcher inference—was documented throughout the analytical process.

Table 1. Principal Sources Selected for Documentary Analysis and Extraction of the Preliminary Sustainability Assurance Implementation Framework

No.	Document or Report	Relevant Year/Period	Standard-Setting Body or Assurance Practitioner	Role in Documentary Analysis
1	<i>International Standard on Sustainability Assurance (ISSA) 5000: General Requirements for Sustainability Assurance Engagements</i>	2024	IAASB	Principal reference for extracting sustainability assurance requirements and stages of engagement performance.
2	<i>ISSA 5000 Implementation Guide</i>	2025; amended in July 2025	IAASB	Non-authoritative interpretive guidance for understanding concepts, relationships among requirements, and implementation challenges associated with the Standard.
3	<i>ISAE 3000 (Revised): Assurance Engagements Other Than Audits or Reviews of Historical Financial Information</i>	2013	IAASB	Identification of professional foundations and interpretation of assurance reports prepared under this Standard.
4	<i>ISAE 3410: Assurance Engagements on Greenhouse Gas Statements</i>	2012	IAASB	Examination of earlier specialized requirements for assurance on emissions information and interpretation of reports based on this Standard.
5	<i>International Standard on Quality Management (ISQM) 1</i>	2020	IAASB	Identification of firm-level quality management requirements and their relationship with engagement quality.
6	<i>International Ethics Standards for Sustainability Assurance (IESSA)</i> , including International Independence Standards	2025	IESBA	Identification of ethical considerations, independence requirements, conflicts of interest, and risks related to misleading sustainability information.
7	<i>AA1000 Assurance Standard (AA1000AS) v3</i>	2020	AccountAbility	Examination of the principles-based assurance approach and stakeholder accountability considerations.
8	<i>IFRS S1: General Requirements for Disclosure of Sustainability-related Financial Information</i>	2023	ISSB, IFRS Foundation	Identification of reporting criteria and qualitative characteristics of sustainability-related financial information.
9	<i>IFRS S2: Climate-related Disclosures</i>	2023	ISSB, IFRS Foundation	Identification of climate-related disclosure topics and criteria relevant to assurance.
10	<i>GRI 1: Foundation 2021</i>	2021	GSSB, Global Reporting Initiative	Examination of reporting-quality principles and the foundations for reporting economic, environmental, and social impacts.
11	<i>GRI 2: General Disclosures 2021</i> , particularly Disclosure 2-5 on External Assurance	2021	GSSB, Global Reporting Initiative	Examination of disclosure requirements concerning assurance policy, engagement scope, basis of work, and relationship with the independent assurance practitioner.
12	Iran Sustainability Disclosure Standard 1: General Requirements for Disclosure of Sustainability-related Financial Information	Approved in 2024; effective for annual reporting periods beginning in 2026 according to the Standard	Iranian Audit Organization	National basis for examining reporting criteria and adapting the model to the Iranian context.
13	Sustainability section and independent assurance	2024 performance	KPMG Australia	Examination of the distinction between reasonable assurance over Scope 1 and

	report in <i>Rio Tinto Annual Report 2024</i>			Scope 2 emissions and limited assurance over other selected sustainability information.
14	Sustainability statement and independent assurance report in <i>Unilever Annual Report and Accounts 2024</i>	2024 performance; independent report issued in 2025	KPMG LLP	Examination of limited assurance over the ESRS-based sustainability statement, double materiality process, and allocation of responsibilities.
15	<i>Microsoft 2024 Environmental Sustainability Report—Data Fact Sheet</i> and independent review report	Published in 2024; fiscal period ended June 2023	Deloitte & Touche LLP	Examination of limited assurance under AICPA standards and distinction between information subject to assurance and other data and forward-looking information.
16	<i>HSBC 2024—Financed Emissions Independent Assurance Report</i>	2024 reporting; issued in 2025; metric periods as specified in the report appendix	PricewaterhouseCoopers LLP	Examination of assurance over financed emissions, entity-specific criteria, data quality, and boundaries of information coverage.
17	<i>Vale Integrated Report 2024</i> and assurance report on non-financial information	2024 performance; published in 2025	PwC	Examination of limited assurance over non-financial information, use of multiple criteria, and management responsibility for sustainability information controls.
18	<i>POSCO INTERNATIONAL 2023 ESG Factbook</i> and Independent Assurance Statement	2023 performance; assurance statement issued in July 2024	DNV Business Assurance Korea Ltd.	Examination of practices of a non-accountant assurance provider, multidisciplinary teams, risk-based approach, site visits, and scope limitations.
19	"Assurance on Sustainability Reports: An International Comparison," Simnett, Vanstraelen, and Chua	2009	<i>The Accounting Review</i> , 84(3), 937–967	Identification of relationships among company characteristics, industry, institutional environment, the decision to obtain assurance, and type of assurance practitioner. DOI: 10.2308/accr.2009.84.3.937.
20	"ISSA 5000: Key Features of the International Sustainability Assurance Standard," Kamp-Roelands	2025	<i>Maandblad voor Accountancy en Bedrijfseconomie</i> , 99(2), 85–96	Scientific interpretation of the structure and key concepts of ISSA 5000 and their relationship with professional developments. DOI: 10.5117/mab.99.149097.

Documentary analysis of the standards, professional guidance, and selected corporate reports from diverse institutional environments enabled comparison of assurance requirements, reporting criteria, and implementation practices. Thematic analysis was performed using a combined deductive and inductive logic, and codes were recorded together with source information and the location of supporting evidence to ensure that the process of extracting and organizing themes remained traceable. The analytical dimensions included engagement acceptance and scope determination, professional responsibilities and competencies, quality management, planning and assessment of risks of misstatement, evidence gathering, characteristics of sustainability information, and conclusion formation and reporting. Comparison of the Rio Tinto, Microsoft, and HSBC reports demonstrated that differences in assurance level, information covered, and periods associated with individual metrics highlight the need to establish a clear relationship among the subject matter, measurement criteria, period, assurance level, and conclusion. To strengthen the dependability of the analysis, the reasons for merging or separating codes and inconsistencies among documents were recorded, and the absence of reference to a particular practice was interpreted merely as non-disclosure of that practice in the document. Corporate reports were also examined as evidence of actual professional practice, and their conformity with ISSA 5000 was considered dependent on explicit identification of the basis of the engagement in the independent assurance report. The output of this phase was a preliminary evidence-based framework specifying, for each component, its source of authority, objective,

responsible party, inputs, activities, and outputs. This framework served as the basis for examining the appropriateness of the components and context-specific recommendations for Iran during expert interviews.

Assurance on sustainability reports requires integration among reporting criteria, organizational responsibilities, practitioner competence and independence, engagement procedures, and communication of the conclusion to intended users. Based on the integration of professional documents and evidence from the selected reports, the preliminary research framework was developed to translate the requirements of ISSA 5000 into observable activities, responsibilities, and outputs. The framework covers implementation prerequisites, the engagement process, and the structure of the independent assurance report and provides a basis for examining the compatibility of the components with Iran's institutional, professional, and organizational conditions. Components related to the design of national mechanisms at this stage represent preliminary research proposals and were to be evaluated and refined through expert interviews. In developing the framework, implementation requirements were distinguished from public-reporting components and supplementary recommendations so that the status of each component would be explicit. In the reporting section, the conclusion is positioned in the first section of the report, with the basis for conclusion presented immediately thereafter. Additional findings and recommendations should also be presented in a manner that clearly distinguishes them from the independent conclusion. Table 2 presents the structure of the extracted preliminary framework and the operational function of its components.

Table 2. Preliminary Framework Extracted for Implementing Assurance on Sustainability Reports in Iran in Conformity with ISSA 5000

No.	Framework Component	Operational and Content Components and Requirements	Status and Basis for Development
1	Institutional mechanism for implementation in Iran	Identification of functions required for standard setting, regulation, professional oversight, training, and competency assessment. Proposed allocation of responsibilities among relevant institutions and determination of coordination mechanisms. Provision for pilot implementation in companies with adequate information readiness and revision of implementation guidance based on practical experience. The output of this component is a proposed map of responsibilities and implementation stages.	Researcher's contextualization proposal based on the research problem and the need to translate international requirements into a national implementation mechanism. Final assignment of institutional responsibilities depends on regulatory review and expert evaluation.
2	Acceptance and continuance of the assurance engagement	Preliminary understanding of the reporting entity, engagement objective, and intended users. Assessment of access to relevant information and personnel, sufficiency of professional resources, and ability to obtain evidence. Agreement on scope, assurance level, responsibilities of the parties, and form of report. Documentation of the decision to accept or continue the engagement and the underlying rationale in the engagement file.	Implementation prerequisite. The process from acceptance through reporting is described in the ISSA 5000 Implementation Guide (IAASB).
3	Reporting criteria and metric specifications	Identification of the criteria applied to each subject matter or metric, including national standards, IFRS S1, IFRS S2, GRI Standards, or appropriate entity-specific criteria. Proposed preparation of a specification sheet for each metric containing its definition, unit of measurement, calculation method, data source, data owner, and reporting period. Assessment of clarity of the criteria and their accessibility to users.	Component common to implementation and reporting. Based on the integration of selected reporting criteria and practices concerning disclosure of the basis of preparation and entity-specific criteria in corporate reports.
4	Scope, boundary, and period of information	Precise identification of information subject to assurance, covered units and locations, organizational boundary, and extent of value-chain coverage. Specification of the date or period applicable to each information category and documentation of exclusions. Proposed development of a scope matrix containing subject matter, metric, period, criteria, and assurance level to prevent	Component common to implementation and reporting. The Microsoft report distinguishes specified information subject to review from other sections and forward-looking information.

		ambiguity regarding the boundaries of the engagement.	
5	Selection of assurance level	Selection of limited assurance, reasonable assurance, or a combination thereof for specified information. Alignment of assurance procedures and evidence requirements with the selected level. In mixed engagements, separate documentation of the scope, procedures, and conclusion relating to each level. Proposed use of a scope matrix to display these distinctions in the engagement agreement, engagement file, and report.	Component common to implementation and reporting. The Rio Tinto report distinguishes reasonable assurance over Scope 1 and Scope 2 emissions from limited assurance over other selected sustainability information.
6	Professional ethics, independence, and team competence	Evaluation of independence, conflicts of interest, and threats arising from relationships or other services. Consideration of management pressure, bias, and misleading sustainability claims. Determination of team composition appropriate to the subject matter and use of specialists when necessary. Proposed documentation of competence assessments, assignment of team responsibilities, and review of specialists' work in the engagement file.	Professional prerequisite based on sustainability ethics and independence documents and evidence concerning the use of multidisciplinary teams in practice (IESBA).
7	Quality management and documentation	Assignment of engagement responsibility, allocation of resources, direction and review of team activities, and follow-up of unresolved matters. Proposed linkage of each significant conclusion to the relevant metric, risk, procedure performed, and supporting evidence. Documentation of professional judgments and reasons underlying decisions. Provision for engagement quality review where required and systematic retention of assurance documentation.	Implementation and professional-oversight component based on the quality management approach in ISQM 1 (IAASB).
8	Planning, materiality, and risk assessment	Understanding the entity's activities, environment, and process for preparing sustainability information. Identification of areas susceptible to misstatement, sensitive data, estimates, and relevant controls. Determination of quantitative and qualitative materiality considerations and design of assurance procedures responsive to identified risks. Proposed preparation of a risk-and-procedure matrix for each material subject matter and revision of the matrix as new evidence is obtained.	Implementation component integrating the risk-based framework with practices observed in selected reports, including materiality and assurance-focus areas in HSBC.
9	Evidence gathering and evaluation	Selection of procedures such as inspection of documentation, inquiry, data analysis, recalculation, corroboration with independent sources, and site visits according to engagement circumstances. Proposed documentation of the data trail from the original source to final disclosure and examination of changes or adjustments. Consideration of the reliability of third-party data and evidence inconsistent with management explanations.	Implementation component based on methods observed in selected reports, including examination of systems, controls, documentation, and site visits in the DNV assurance statement.
10	Final evaluation and reporting decision	Examination of unresolved matters, corrected and uncorrected misstatements, and limitations on access to evidence. Proposed documented summary for each material subject matter and assessment of its consistency with the overall conclusion. Communication with management and those charged with governance regarding matters affecting the report. Completion of required reviews before issuance of the independent report.	Implementation component derived from the integration of evidence evaluation and conclusion-forming stages with the model's requirement for traceable and reviewable decisions.
11	Title and addressee of the independent report	Selection of a title that makes the practitioner's independence and assurance level explicit. Depending on engagement circumstances, the title may refer to limited assurance, reasonable assurance, or a combination thereof. Identification of the addressee in accordance with the engagement agreement and applicable requirements. Where necessary, explanation of the purpose of the report and intended users to clarify the context of use.	Public-reporting component based on the structure of selected independent assurance reports and ISSA 5000 requirements concerning title and addressee.
12	Conclusion in the first section of the report	Identification of the reporting entity and specification of the information, period, criteria, and assurance level associated with the conclusion. Expression of a limited assurance conclusion using negative-form wording indicating that no matter has come to the practitioner's attention that would indicate material	Mandatory public-reporting component. ISSA 5000, paragraph 190.

		misstatement. Expression of a reasonable assurance opinion in positive form regarding preparation or presentation of information in accordance with the criteria. Separate conclusions for different assurance levels in mixed engagements.	
13	Basis for conclusion	Placement of this section immediately after the conclusion. Identification of the assurance standard applied and the ethical, independence, and quality management basis. Statement of the evidential basis supporting the conclusion. In a limited assurance engagement, explanation of differences in the nature, timing, and extent of procedures compared with reasonable assurance. In the case of a modified conclusion, description of the matter giving rise to modification.	Public-reporting component based on the “Basis for Conclusion” structure in the Standard and selected independent reports, including Unilever and HSBC.
14	Responsibilities of management and those charged with governance	Description of management's responsibility for preparing the information in accordance with the criteria, selecting reporting methods, and making appropriate estimates. Explanation of responsibility for designing, implementing, and maintaining controls necessary to prepare information free from material misstatement. Identification of the party responsible for overseeing the reporting process where different from the party responsible for preparing the information. Reflection of this distinction in the report and in the model's responsibility map.	Component common to organizational governance and reporting based on the separation of preparation, control, and oversight responsibilities in the Unilever independent report.
15	Responsibilities of the independent assurance practitioner	Explanation of the practitioner's responsibility to plan and perform the engagement, obtain evidence, and provide a conclusion regarding the information covered. Description of the role of professional judgment and professional skepticism. Clarification of the extent of examination of controls and sustainability subject matters in accordance with the engagement scope. Explicit linkage of the conclusion to the specified information and criteria to prevent an overly broad interpretation that the practitioner has endorsed the company's overall performance.	Public-reporting component based on practitioners' responsibilities in independent reports, including Microsoft and Vale.
16	Summary of work performed	Description of procedures performed in light of the assurance level and subject matter. Explanation, to the extent necessary for users' understanding, of the basis for selecting data or locations and the methods used for document examination, inquiries, and analytical procedures. Proposed reconciliation of the description in the report with engagement documentation so that only procedures actually performed are reported.	Mandatory component of a limited assurance report. ISSA 5000, paragraph 190.
17	Inherent limitations of sustainability information	Explanation of material uncertainties associated with measurement, estimation, conversion factors, and forward-looking information where relevant to the subject matter. Description of how these characteristics affect users' understanding of the information. Distinction between inherent limitations and limitations on access to evidence in the engagement file and assessment of the reporting implications of each.	Public-reporting component where appropriate. The Microsoft report addresses uncertainty in measurement and estimation methodologies and boundaries of information subject to review.
18	Modified conclusion	Documentation of the cause of modification and its effect on the information subject to assurance. Selection of a qualified or adverse conclusion in the case of material misstatement and a qualified conclusion or disclaimer of conclusion in the case of insufficient evidence, depending on the materiality and pervasiveness of the effects. Alignment of the conclusion heading, basis for modification, and scope explanation.	Conditional public-reporting component. ISSA 5000, paragraphs 203–206.
19	Other information and comparative information	Identification of other information accompanying the report and documentation of potential inconsistencies with information subject to assurance. Identification of comparative periods covered and explanation of changes in criteria or calculation methods where necessary. Proposed separate documentation of the coverage status of prior-period information in the scope matrix and report.	Implementation and reporting component where applicable. The “Other Information” section is included when required by the Standard and is omitted in the case of a disclaimer of conclusion where applicable.

20	Emphasis of matter and other explanatory paragraphs	Determination of the need to draw users' attention to a significant disclosed matter or explain a matter relevant to understanding the engagement. Use of a clear heading and explanation of the relationship of the matter to the conclusion. For information prepared for a special purpose, explanation of the context of use. Proposed review of these paragraphs together with the conclusion and basis for conclusion to preserve report coherence.	Conditional public-reporting components. Explanatory paragraphs are presented separately from the conclusion and matters giving rise to modification.
21	Signature, location of practice, engagement leader's name, and date	Inclusion of practitioner details, signature, location of practice, and date of report. Verification that sufficient evidence has been obtained, responsibility for the information has been acknowledged by authorized persons, and required reviews have been completed before dating the report. For listed entities, disclosure of the engagement leader's name as required by the Standard, subject to the stated exception.	Final public-reporting components. ISSA 5000, paragraphs 190 and 191.
22	Supplementary recommendations and improvement follow-up	Proposed documentation of process and control deficiencies together with the party responsible for remedial action, implementation timeline, and expected evidence of remediation. Communication of recommendations through management correspondence or a clearly identified supplementary report section, as appropriate. Retention of decision-making and remediation responsibility by management. Use of implementation feedback to revise the proposed research framework.	Supplementary and proposed component of the model. Where recommendations are provided, they are clearly distinguished from the independent conclusion. This component is proposed to support improvement mechanisms and expert evaluation.

The preliminary framework establishes a connection among institutional and organizational readiness, evidence-based assurance procedures, and clear communication of the conclusion to users. Within this structure, the criteria, scope, period, and assurance level are specified for each category of information, and responsibility for preparing and overseeing the information is distinguished from responsibility for expressing an independent conclusion. The implementation components also enable the relationship among identified risks, assurance procedures, evidence, and final decisions to be traced. Attention to information uncertainty, evidence limitations, and differences among assurance levels helps define the extent to which users may rely on the report. Moreover, classification of components as mandatory, conditional, or proposed provides a basis for converting the framework into implementation guidance, assurance working papers, and instruments for collecting expert opinions. In the subsequent phase, proposals concerning allocation of institutional responsibilities, professional competence, data infrastructure, quality oversight, and phased implementation in Iran were examined together with the other components through semi-structured interviews so that the documentary framework could be refined and contextualized on the basis of field evidence.

In the field phase of the study, eight experts were interviewed to examine and refine the preliminary sustainability assurance framework aligned with ISSA 5000 and to explain the requirements for its implementation in Iran. Three participants had between 10 and 20 years of professional experience, four had between 20 and 25 years of experience, and one had more than 25 years of professional experience. In terms of age, three participants were younger than 35 years, two were between 35 and 45 years, and three were older than 45 years. Six participants were men and two were women; three held master's degrees and five held doctoral degrees. The participants' postgraduate education and at least 10 years of professional experience facilitated examination of the subject from both theoretical and practical perspectives. Assessment of the adequacy of the interviews and dependability of the findings also depended on the richness of the data and documentation of the analytical process.

Table 3. Demographic Characteristics of the Interviewees

Criterion	Category	Frequency	Percentage
Professional experience	10–20 years	3	37.5
	20–25 years	4	50.0
	More than 25 years	1	12.5
Total		8	100
Age	Younger than 35 years	3	37.5
	35–45 years	2	25.0
	Older than 45 years	3	37.5
Total		8	100
Gender	Male	6	75.0
	Female	2	25.0
Total		8	100
Education	Master's degree	3	37.5
	Doctoral degree	5	62.5
Total		8	100

Analysis of the responses emphasized the need to link the requirements of ISSA 5000 to responsibilities, prerequisites, activities, documentation, and assessable outputs. Accordingly, the framework should integrate the institutional mechanism for implementation, the sustainability assurance engagement process, and reporting requirements and should clarify the allocation of responsibilities among standard-setting, regulatory, and supervisory bodies according to their legal mandates and implementation capacities. Contextualization also requires adaptation of implementation arrangements to Iran's regulations, industry characteristics, and infrastructure while preserving the requirements of the Standard and maintaining a distinction between reporting criteria and the assurance standard. At the engagement level, it is necessary to assess engagement acceptance preconditions, determine the materiality of misstatements, define the scope and boundaries of the information precisely, and select an assurance level appropriate to users' needs and engagement circumstances. Responsibility for preparing the information and related controls remains with management, whereas the independent assurance practitioner is responsible for evaluating evidence and forming the conclusion. Verification of team competence and independence, evaluation of specialists' work, and quality management also constitute professional requirements of the framework. Regarding estimates, forward-looking information, and digital tools, evaluation of methodologies, assumptions, data quality, and reviewability of outputs is important. The independent report should transparently identify the subject matter, period, criteria, and assurance level, and decisions regarding modification of the conclusion should be based on the cause of the matter and the materiality and pervasiveness of its effects. To address fragmented data, shortages of expertise, preparation costs, and weak coordination, readiness assessment, pilot implementation, revision of guidance, and gradual expansion were recommended. Information traceability, documentation quality, clarity of responsibilities, and the possibility of oversight were identified as bases for refining the framework and evaluating its implementation.

Analysis of the interviews indicates that implementation of sustainability assurance in Iran depends on coordination among institutional arrangements, professional competencies, and companies' information readiness. Contextualization should adapt implementation mechanisms to national conditions while preserving the requirements of ISSA 5000 and the distinction between reporting criteria and assurance requirements. At the institutional level, allocation of responsibilities for standard setting, regulation, competency certification, and quality oversight should be based on the legal authority and implementation capacity of the relevant institutions. At the professional level, independence, management of conflicts of interest, team competence, and quality management are important, while responsibility for evaluating evidence and forming the conclusion remains with the independent

practitioner. At the organizational level, management accountability, assignment of responsibility for each indicator, documentation of measurement methods, and data traceability are prerequisites for readiness assessment and engagement acceptance. Clear determination of scope, period, information boundaries, and assurance level, as well as judgments about materiality appropriate to the nature of the disclosure, should lead to corresponding assurance procedures and evidence. Reliance on technology also requires assessment of data quality, tool validity, and reviewability of results. To operationalize the framework, each component should be linked to a responsible party, prerequisites, activities, documentation, and assessable outputs. Readiness assessment, pilot implementation, and revision of guidance also provide a pathway for gradual implementation and make the relationship among responsibilities, risks of misstatement, evidence, and the conclusion traceable.

The preliminary framework was revised based on the synthesis of interview responses to clarify responsibilities, strengthen implementability, and link the requirements of ISSA 5000 to assessable activities and outputs. The principal revisions included further specification of institutional responsibilities and coordination, development of a compliance matrix for national criteria and regulations, assessment of engagement acceptance preconditions, and precise determination of the scope and level of assurance. Responsibilities for data preparation, control, and approval; the information-transfer pathway; team competence and independence; and quality management were also clarified. For each component, the party responsible for implementation, activities, documentation, and assessable outputs were specified, while requirements derived directly from the Standard, engagement-specific components, and developmental recommendations were distinguished from one another. Responsibility for preparing information and implementing corrective actions remains with the company, while the independent practitioner is responsible for assurance procedures and forming the conclusion. The practitioner's quality management system was also distinguished from the reporting entity's internal controls. Use of technology was made conditional on assessment of data quality, tool validity, and reviewability of outputs. The report title should reflect the scope and assurance level, and the conclusion should precede the basis for conclusion. Pilot implementation, documentation of deficiencies, and revision of guidance were incorporated into the implementation process. Potential implementation barriers also remained areas for assessment, and the necessity of individual components was distinguished from their feasibility so that implementation difficulty would form the basis for designing appropriate support mechanisms.

Table 4. Framework Revised Based on Expert Opinions

No.	Framework Component	Operational and Content Components and Revisions	Status and Assessable Output
1	Institutional mechanism for implementation in Iran	Separation of responsibilities for standard setting, disclosure regulation, practitioner qualification, training, and quality oversight; examination of the role of existing institutions based on statutory authority; establishment of mechanisms for coordination, resolution of disagreements, and revision of implementation guidance.	Context-specific model proposal: institutional responsibility map, coordination mechanism, and implementation program.
2	Acceptance and continuance of the assurance engagement	Preliminary understanding of the company, engagement objective, and intended users; assessment of preconditions, independence, resources, and ability to obtain evidence; determination of the effect of deficiencies on acceptance; agreement on responsibilities, scope, assurance level, and form of report.	Implementation requirement: acceptance/continuance working paper, rationale for the decision, and engagement agreement.
3	Reporting criteria and metric specifications	Identification of applicable national or international criteria and their versions; assessment of the suitability of criteria; determination of relationships among multiple criteria; preparation of metric specifications containing definition, unit, calculation method, source, data owner, and period; provision of user access to the criteria.	Requirement for suitable criteria accompanied by a proposed tool: list of criteria, basis of preparation, and metric specification sheets.

4	Scope, boundary, and period of information	Precise identification of disclosures, indicators, units, and locations subject to assurance; specification of organizational boundary and value-chain coverage; documentation of the period associated with each category of information and exclusions; identification of information subject to assurance within the sustainability report.	Component common to implementation and reporting: matrix of scope, boundary, period, criteria, and assurance level.
5	Selection of assurance level	Selection of limited, reasonable, or combined assurance based on users' needs, applicable requirements, and engagement circumstances; alignment of procedures and evidence with the selected level; differentiation of scope and conclusion for each level in mixed engagements; documentation of reasons for the selection.	Component common to implementation and reporting: agreed assurance level and corresponding assurance plan.
6	Professional ethics, independence, and team competence	Assessment of independence threats and conflicts of interest, including prior services and participation in preparing information; team composition based on assurance knowledge and subject-matter expertise; assessment of specialists' competence, objectivity, and adequacy of their work; reassessment throughout the engagement.	Professional prerequisite: independence documentation, competence assessment, assignment of responsibilities, and review of specialists' work.
7	Quality management and documentation	Establishment of a quality management system within the practitioner's firm in accordance with applicable requirements; designation of engagement responsibility; direction, supervision, and review of work; documentation of judgments and unresolved matters; linkage of significant conclusions to risks, procedures, and evidence; completion of engagement quality reviews where required.	Professional and implementation requirement: organized engagement file, review documentation, and traceable decisions.
8	Planning, materiality, and risk assessment	Understanding of activities and the reporting process; determination of materiality for quantitative and qualitative disclosures; distinction between the company's identification of material sustainability matters and materiality of misstatement; consideration of double materiality where required by the criteria; risk assessment appropriate to limited or reasonable assurance and reassessment as new information is obtained.	Implementation requirement accompanied by a proposed tool: engagement plan, materiality basis, and risk-and-procedure matrix.
9	Evidence gathering and evaluation	Selection of document inspection, inquiry, observation, analytical procedures, recalculation, independent corroboration, and site visits responsive to risks and assurance level; tracing data from source to disclosure; assessment of reliability of third-party information; investigation of contradictory evidence; and evaluation of the sufficiency and appropriateness of the evidence as a whole.	Implementation requirement: assurance working papers, data-traceability documentation, and evidence summary for each disclosure.
10	Final evaluation and reporting decision	Aggregation of identified misstatements; evaluation of uncorrected misstatements, evidence limitations, and unresolved matters; assessment of consistency between conclusions on individual matters and the overall conclusion; communication with management and those charged with governance; completion of required decisions and reviews before issuance.	Implementation requirement: engagement completion memorandum and documented conclusion decision.
11	Title and addressee of the independent report	Use of a clear title regarding the practitioner's independence and level of assurance; specification of the addressee in accordance with engagement circumstances and applicable requirements; explanation of purpose or intended users where necessary; consistency of the title with information actually covered.	Public-reporting component: a clear title and addressee appropriate to the engagement.
12	Conclusion in the first section of the report	Identification of the company, information, period, criteria, and assurance level; expression of an appropriately worded limited assurance conclusion or reasonable assurance opinion; separate conclusions for components subject to different assurance levels; preservation of a clear connection between the conclusion and engagement scope.	Mandatory public-reporting component: clear conclusion on specified information.
13	Basis for conclusion	Placement immediately after the conclusion; identification of the engagement standard, ethical and independence requirements, and quality management basis; explanation of the evidential basis for the conclusion; explanation of differences between limited and reasonable assurance procedures; explanation of reasons for modification when relevant.	Mandatory public-reporting component: understandable basis consistent with the conclusion.

14	Responsibilities of management and those charged with governance	Description of responsibility for preparing information in accordance with the criteria, selecting methods, making estimates, and maintaining necessary controls; specification of the oversight role of those charged with governance; completion of a responsibility matrix for preparation, control, aggregation, and approval of data; retention of accountability by the company.	Component common to organizational governance and reporting: responsibility matrix and clear statement of responsibilities in the report.
15	Responsibility of the independent practitioner	Description of the practitioner's responsibility for planning, performing procedures, evaluating evidence, and providing an independent conclusion; explanation of the role of professional judgment and skepticism; clarification of the extent of examination of controls and information; linkage of the conclusion to the agreed criteria and scope.	Public-reporting component: explanation of practitioner responsibility and engagement boundaries.
16	Summary of work performed	Objective description of the procedures performed and their nature, timing, and extent; explanation of document inspection, inquiries, analytical procedures, and site selection to the extent necessary for users' understanding; reconciliation of the report description with activities documented in the engagement file.	Mandatory component of a limited assurance report: understandable summary of work actually performed.
17	Estimates and inherent limitations of information	Evaluation of methodologies, data, and assumptions underlying estimates and forward-looking information; examination of measurement uncertainty and value-chain data; assessment of adequacy of disclosures; distinction between inherent limitations and restrictions on access to evidence; explanation of relevant limitations in the report where appropriate.	Implementation and reporting component where applicable: documented assessment of estimates and explanation of relevant limitations.
18	Modified conclusion	Determination of the cause of the matter and the materiality and pervasiveness of its effects; selection of a qualified or adverse conclusion for material misstatement and a qualified conclusion or disclaimer of conclusion for evidence limitations; consistency between the conclusion heading and basis for modification; simultaneous consideration of multiple matters affecting the report.	Conditional public-reporting component: documented decision and modified conclusion appropriate to the matter.
19	Other information and comparative information	Identification of other accompanying information and examination of inconsistencies; determination of prior-period information coverage; examination of consistency of criteria and calculation methods or disclosure of changes; provision of necessary explanations regarding prior engagements or unassured information.	Implementation and reporting component where applicable: comparative working paper and necessary explanatory sections.
20	Emphasis of matter and other explanatory matters	Determination of the need to draw attention to an important disclosed matter or a matter relevant to understanding the engagement; explanation of special-purpose criteria where necessary; distinction of additional legal responsibilities; preservation of the distinction between explanatory paragraphs and matters leading to modification.	Conditional public-reporting components: clear paragraphs appropriate to engagement circumstances.
21	Signature, location of practice, engagement leader, and date	Inclusion of signature and location of practice; dating only after sufficient evidence has been obtained, responsibility for the information has been acknowledged, and prescribed reviews have been completed; identification of the engagement leader for listed entities subject to the Standard's exception.	Final public-reporting components: completed report and pre-issuance control documentation.
22	Supplementary recommendations and improvement follow-up	Documentation of process and control deficiencies, party responsible for action, deadline, and evidence of remediation; communication of recommendations through correspondence or a clearly identified supplementary section; separation of recommendations from the independent conclusion; follow-up of actions while maintaining management responsibility for decision-making and implementation.	Proposed model-development component: remediation plan and follow-up documentation.
23	Compliance matrix for criteria and national regulations	Identification of applicable requirements concerning environmental matters, energy, water, safety, labor relations, and corporate disclosure; verification of applicability to the company and reporting period; documentation of the relationship between each requirement, reporting criterion, and data source; explanation of differences in definitions and calculation bases.	Proposed contextualization tool: matrix of subject matter, requirement, criterion, data, and accountable party.

24	Organizational readiness and information infrastructure	Assessment of data sources, supporting documentation, collection and aggregation controls, and change histories; assignment of a responsible owner to each data item; design of a deficiency-remediation program; use of internal audit and the audit committee within their mandates; training of reporting personnel.	Proposed supporting component: readiness assessment and plan for improving data and controls.
25	Digital technologies and tool controls	Purposeful use of data analytics, digital monitoring, and artificial intelligence in accordance with engagement needs; assessment of input-data quality and validity of tool performance; verification of measurement equipment accuracy; maintenance of change logs and reviewability of outputs; access controls and information protection.	Proposed solution contingent on need: documented tool assessment and evidence supporting reliability of outputs.
26	Phased implementation and evaluation of success	Selection of pilot companies considering diversity of activities and readiness; determination of outputs and progression criteria for each implementation stage; documentation of costs and deficiencies; revision of guidance and expansion of application; assessment of data traceability, documentation quality, remediation of deficiencies, and user understanding; separate assessment of the necessity and feasibility of components in the quantitative phase.	Proposed model implementation and validation mechanism: pilot program, evaluation criteria, and quantitative-phase measurement items.

The revised framework retains the principal components of the preliminary table while adding tools for regulatory alignment, readiness assessment, technology controls, and phased implementation, thereby clarifying their relationship with the conditions governing sustainability assurance implementation in Iran. Within this structure, institutional-level revisions are linked to responsibility and coordination, professional-level revisions to competence and engagement quality, and organizational-level revisions to accountability and information reliability. The specified outputs also make it possible to assess the implementation of each component. This framework constitutes the output of the qualitative phase of the study and provides the basis for development of the quantitative instrument. The necessity, implementation feasibility, and priority of context-specific solutions will be evaluated in the subsequent phase. The operationalization process of the framework is presented in Figure 1. The process begins with determination of criteria and preparation of information and, after assessment of preconditions, proceeds to determination of scope and assurance level, planning, performance of assurance procedures, and the reporting decision. Corporate self-assessment and internal audit activities may strengthen the readiness of data and controls, whereas the independent practitioner exercises judgment regarding engagement acceptance, sufficiency of evidence, and the report conclusion. Feedback derived from the assurance procedures provides a basis for management's corrective actions and improvement of the reporting process in subsequent periods.

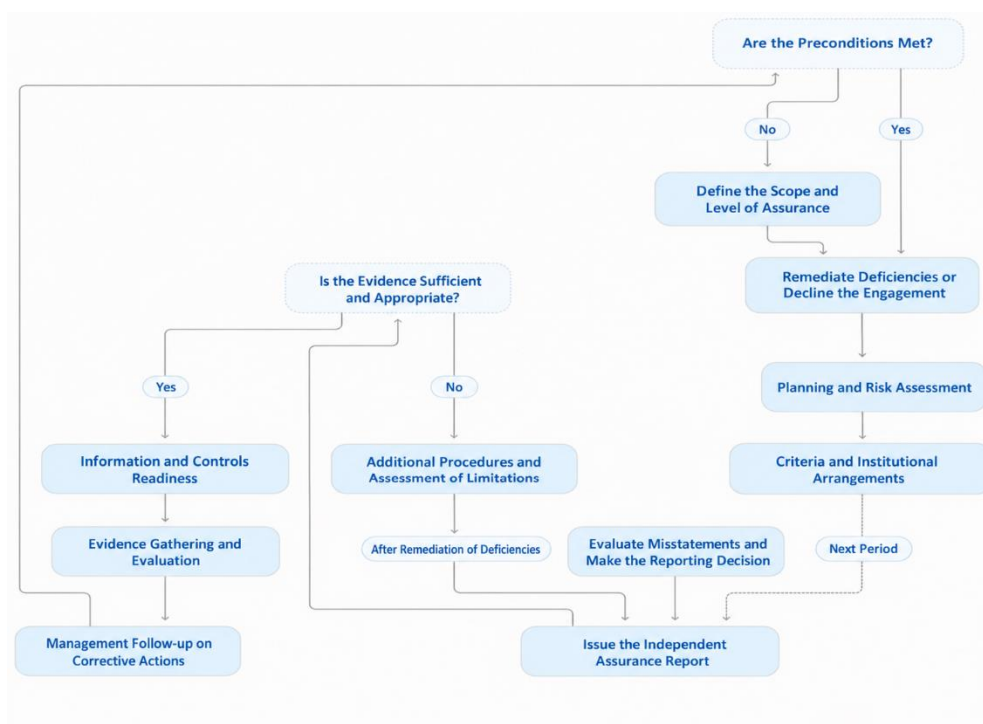


Figure 1. Operationalization Stages of the Revised Framework for Assurance on Sustainability Reports

To formulate the qualitative findings, the content of the documents, interview responses, and revised framework was analyzed using a combined deductive and inductive logic. The requirements of ISSA 5000 provided the basis for identifying professional and process-related components, while concepts derived from expert responses supplemented the institutional, organizational, and context-specific arrangements. The findings were organized according to semantic similarity, relevance to the research problem, and the operational role of the concepts using the three-level thematic network structure proposed by Attride-Stirling (2001). This process included identification of meaning units, formulation of basic themes, refinement and consolidation of concepts into organizing themes, formation of global themes, and examination of network coherence. Throughout the process, requirements derived from the Standard, engagement-dependent conditions, and context-specific proposals were distinguished from one another, and each basic theme was assigned an independent code and a single principal position. The analysis resulted in five global themes, 26 organizing themes, and 134 basic themes that explain the connections among the institutional context, organizational readiness, professional quality, performance of assurance procedures, and independent reporting. These numbers represent the number of concepts included in the final structure and do not indicate the frequency of views, degree of expert agreement, or relative importance of the components.

Table 5. Global, Organizing, and Basic Themes of the Implementation Model for Assurance on Sustainability Reports in Iran

Global Themes	Organizing Themes	Basic Themes
1. Institutional and Regulatory Context and Capacity for Model Implementation	O1. Allocation of responsibilities and institutional coordination	B1: Designation of the body responsible for standard setting; B2: designation of the body responsible for disclosure regulation; B3: designation of the authority responsible for practitioner qualification; B4: institutional coordination and resolution of professional disagreements.
	O2. Regulation and quality oversight of services	B5: Determination of arrangements for adoption of ISSA 5000 in Iran; B6: determination of the scope of application of assurance requirements; B7: quality oversight of assurance practitioners' services; B8: professional accountability for compliance with requirements; B9: revision of regulations and implementation guidance.

	O3. Alignment with national criteria and regulations	B10: Identification of applicable national criteria; B11: determination of applicability of environmental, energy, and water regulations; B12: determination of applicability of safety and labor regulations; B13: reconciliation of definitions and calculation bases between national and selected criteria; B14: identification of the data source and accountable party for each requirement.
	O4. Training and professional capacity development	B15: Assessment of training needs of model implementers; B16: specialized training of assurance practitioners; B17: training of managers and data owners; B18: evaluation of training effectiveness and competency attainment.
	O5. Phased implementation and evaluation	B19: Selection of pilot companies based on readiness; B20: determination of outputs and progression criteria for implementation stages; B21: documentation of costs and barriers encountered during pilot implementation; B22: revision of guidance based on implementation experience; B23: evaluation of implementation quality before expansion.
2. Organizational Governance and Sustainability Information Readiness	O6. Responsibilities of management and those charged with governance	B24: Management accountability for information preparation; B25: allocation of responsibility for data control and approval; B26: oversight of reporting by those charged with governance; B27: approval of information by authorized persons; B28: determination of the role of internal audit and the audit committee.
	O7. Suitable criteria and metric specifications	B29: Identification of reporting criteria and their version; B30: assessment of the suitability of selected criteria; B31: accessibility of criteria to users; B32: definition and unit of measurement of the metric; B33: determination of calculation or measurement method; B34: documentation of data source, responsible person, and period.
	O8. Reporting boundary and value-chain information	B35: Identification of units and locations included in reporting; B36: determination of the organizational boundary of the sustainability report; B37: specification of the extent of value-chain coverage; B38: identification of third-party data sources; B39: alignment of data periods with the reporting period.
	O9. Data infrastructure and internal controls	B40: Organization of sustainability-information collection; B41: retention of supporting data documentation; B42: controls over data accuracy and completeness; B43: maintenance of records of changes and adjustments to information; B44: reconciliation of aggregated information with original sources; B45: access controls over reporting systems.
	O10. Digital technology and reliability of tools	B46: Control over the quality of data inputs to tools; B47: validation of analytical-tool performance; B48: verification of the accuracy of measurement equipment; B49: traceability and reviewability of digital outputs; B50: human review of automated analytical results.
3. Professional Quality and Design of the Assurance Engagement	O11. Ethics, independence, and conflicts of interest	B51: Assessment of threats arising from financial relationships; B52: assessment of self-review threats arising from prior services; B53: identification and assessment of conflicts of interest; B54: implementation of necessary actions to eliminate or reduce independence threats; B55: reassessment of independence throughout the engagement.
	O12. Team competence and use of specialists	B56: Verification of assurance knowledge and experience; B57: verification of knowledge of sustainability criteria; B58: provision of relevant subject-matter and industry expertise; B59: assessment of the specialist's competence and objectivity; B60: assessment of the adequacy of work performed by the specialist.
	O13. Quality management and documentation	B61: Assignment of engagement responsibility and accountability; B62: allocation of resources appropriate to the engagement; B63: direction, supervision, and review of team activities; B64: documentation of significant judgments and supporting evidence; B65: consultation on unresolved professional matters; B66: completion of quality review where required.
	O14. Engagement acceptance and continuance	B67: Determination of a rational engagement purpose; B68: identification of intended users; B69: verification of access to relevant information and personnel; B70: assessment of engagement acceptance preconditions; B71: documentation of the acceptance or continuance decision and its rationale.
	O15. Engagement scope and selection of assurance level	B72: Identification of information subject to assurance; B73: documentation of information excluded from the engagement; B74: selection of limited or reasonable assurance appropriate to the circumstances; B75: determination of the coverage of each assurance level in a mixed engagement; B76: contractual agreement regarding scope and responsibilities; B77: alignment of the assurance plan with the assurance level.

4. Performance of Assurance Procedures and Evaluation of Evidence	O16. Planning and determination of materiality	B78: Understanding the activities and environment of the reporting entity; B79: determination of quantitative bases for materiality of misstatement; B80: consideration of the nature and circumstances of qualitative disclosures; B81: consideration of double materiality where required by the criteria; B82: distinction between materiality of sustainability matters and materiality of misstatement.
	O17. Identification and assessment of risks of misstatement	B83: Understanding the information-preparation process for risk assessment; B84: consideration of risks of misleading claims and fraud; B85: assessment of risk at a level appropriate to the engagement type; B86: consideration of the likelihood and magnitude of misstatement; B87: reassessment of risks when new information is obtained.
	O18. Gathering and evaluating the reliability of evidence	B88: Inspection of supporting documents and records; B89: inquiry and observation of processes; B90: recalculation of selected metrics; B91: analytical procedures and corroboration with independent sources; B92: site visits based on assurance needs; B93: investigation of contradictory evidence; B94: evaluation of the sufficiency and appropriateness of evidence.
	O19. Estimates, uncertainty, and forward-looking information	B95: Assessment of estimation methods and data; B96: examination of key management assumptions; B97: assessment of disclosure of measurement uncertainty; B98: assessment of the reliability of value-chain estimates; B99: determination of the boundaries of conclusions regarding forward-looking information.
	O20. Final evaluation of misstatements and limitations	B100: Aggregation of identified misstatements; B101: evaluation of uncorrected misstatements; B102: judgment regarding materiality and pervasiveness of effects; B103: distinction between evidence limitations and inherent limitations; B104: performance of additional procedures where necessary; B105: determination of the effect of unresolved matters on the report conclusion.
5. Independent Reporting, Communication, and Improvement	O21. Title, addressee, and identification of information	B106: Reflection of independence and assurance level in the title; B107: identification of the company and information covered; B108: identification of the addressee of the independent report; B109: specification of the period or date of the information subject to assurance.
	O22. Conclusion and basis for conclusion	B110: Placement of the conclusion in the first section of the report; B111: placement of the basis for conclusion immediately thereafter; B112: appropriate formulation of the limited assurance conclusion; B113: appropriate formulation of the reasonable assurance opinion; B114: separation of conclusions for different assurance levels in a mixed engagement; B115: explanation of the assurance standard and evidential basis of the conclusion.
	O23. Responsibilities of the parties and summary of work	B116: Statement of responsibility for preparation of information in the report; B117: statement of the independent practitioner's responsibility in the report; B118: description of work performed in a limited assurance engagement; B119: clarification of the extent of examination of controls and corporate performance.
	O24. Comparative information and conditional explanatory matters	B120: Determination of the coverage status of comparative information; B121: explanation of changes in criteria and calculation methods; B122: examination of other information and material inconsistencies; B123: inclusion of an Emphasis of Matter paragraph where necessary; B124: inclusion of other matters relevant to understanding the engagement; B125: separation of additional legal responsibilities.
	O25. Final report details and issuance date	B126: Inclusion of the practitioner's signature; B127: inclusion of the location of practice; B128: identification of the engagement leader where required; B129: dating of the report after completion of issuance conditions.
	O26. Recommendations and continuous improvement	B130: Separation of supplementary recommendations from the independent conclusion; B131: identification of the responsible party and deadline for corrective action; B132: examination of evidence demonstrating remediation of deficiencies; B133: incorporation of implementation lessons into training and methodologies; B134: use of feedback to improve reporting in the subsequent period.
Total: 5 global themes	26 organizing themes	134 basic themes

Interpretation of the global themes demonstrates that sustainability assurance is an interconnected process extending from institutional and organizational readiness to professional assurance procedures and independent reporting. The theme of “institutional and regulatory context and capacity for model implementation” explains the conditions necessary for establishing the framework through allocation of institutional responsibilities, regulatory

alignment, training, and quality oversight. The theme of “organizational governance and sustainability information readiness” focuses on management accountability, definition of metrics, determination of reporting boundaries, documentation, and data traceability and links reliance on technology to the quality of inputs and reviewability of outputs. The theme of “professional quality and design of the assurance engagement” integrates team competence and independence, quality management, engagement acceptance decisions, scope determination, and assurance level. The theme of “performance of assurance procedures and evaluation of evidence” uses understanding of the reporting entity, determination of materiality, assessment of risks of misstatement, and selection of appropriate procedures as the basis for evaluating evidence, estimates, value-chain information, and forward-looking information. Finally, the theme of “independent reporting, communication, and improvement” defines the boundaries of users’ reliance through clear identification of the information covered, assurance level, basis for conclusion, and responsibilities of the parties and links assurance findings to corrective actions. This thematic network formulates the conceptual relationship among information readiness, quality of evidence evaluation, and reporting transparency and provides a basis for examining the implementability of the framework.

Discussion and Conclusion

The findings of the present study resulted in an implementation model for sustainability reporting assurance in Iran that is aligned with ISSA 5000 and organized around five global themes, 26 organizing themes, and 134 basic themes. The five global themes comprised the institutional and regulatory context and capacity for model implementation, organizational governance and sustainability information readiness, professional quality and assurance engagement design, performance of assurance procedures and evaluation of evidence, and independent reporting, communication, and improvement. The results indicate that effective sustainability assurance cannot be reduced to the technical execution of assurance procedures or the issuance of an independent report; rather, it depends on the interaction among institutional arrangements, organizational information systems, professional competence, engagement quality, evidence reliability, and transparent reporting. This finding is consistent with prior research showing that sustainability assurance practices are shaped by multiple contextual, organizational, and professional determinants and that assurance quality is strongly influenced by the regulatory environment, practitioner characteristics, reporting systems, and governance structures (6, 9). The proposed model therefore treats sustainability assurance as an integrated governance and assurance architecture rather than as an isolated verification activity.

The first global theme, institutional and regulatory context and capacity for model implementation, emphasizes the need for clear division of responsibilities among standard-setting, regulatory, professional qualification, training, and quality oversight bodies. The expert findings showed that implementation of ISSA 5000 in Iran requires not only formal adoption of the Standard but also the development of coordination mechanisms, national guidance, competency requirements, and phased implementation arrangements. This result is supported by research demonstrating that sustainability reporting and assurance practices differ considerably across jurisdictions because of variations in legal systems, market structures, regulatory enforcement, professional traditions, and institutional maturity (7, 8). The recent experience of European jurisdictions also illustrates that the existence of formal sustainability reporting requirements does not automatically resolve implementation uncertainty; practitioners may still face difficulties concerning assurance scope, criteria, evidence, and professional judgment (10). Accordingly,

the finding that Iran requires a coordinated institutional mechanism is consistent with the broader literature, which views assurance implementation as institutionally embedded rather than universally uniform.

The results also highlighted the importance of aligning international assurance requirements with national reporting and regulatory conditions without weakening the substantive requirements of ISSA 5000. The revised framework introduced a compliance matrix linking sustainability-related national regulations to reporting criteria, data sources, and responsible organizational actors. This finding is particularly relevant to the Iranian environment, where sustainability reporting is still evolving and where regulatory requirements may be distributed across environmental, energy, labor, safety, and corporate disclosure domains. Previous Iranian studies have similarly emphasized the fragmented nature of sustainability reporting research and the need for a more coherent framework capable of connecting accounting, auditing, regulation, and corporate accountability (21). Likewise, studies focusing on sustainability assurance requirements in Iran have identified regulatory ambiguity, lack of unified guidance, limited professional capacity, and insufficient institutional coordination as major implementation challenges (22, 23). Therefore, the present study extends prior evidence by transforming these general challenges into identifiable institutional components and assessable implementation outputs.

The second global theme, organizational governance and sustainability information readiness, showed that assurance quality is fundamentally dependent on the quality of the underlying information system. The findings indicated that companies need clearly defined reporting criteria, metric specifications, reporting boundaries, designated data owners, supporting documentation, internal controls, and traceable data flows before reliable assurance can be performed. This result is consistent with the argument that sustainability assurance cannot improve the quality of information that is inherently poorly defined, inadequately controlled, or unsupported by evidence. The literature on corporate sustainability reporting has repeatedly shown that disclosure quality is closely associated with governance structures and organizational accountability. For example, board independence and ownership structure have been found to influence ESG disclosure practices, suggesting that governance arrangements affect both the quantity and quality of sustainability information (11). Similarly, the broader ESG literature emphasizes that sustainability information is increasingly embedded in corporate governance, financing, and strategic decision-making, making internal accountability for such information more consequential (1).

The findings regarding management responsibility, oversight by those charged with governance, and the role of internal audit also reinforce the importance of internal organizational preparedness. The model specifies that management retains responsibility for preparing sustainability information and maintaining relevant controls, while the independent assurance practitioner remains responsible for evaluating evidence and expressing the conclusion. Internal audit and audit committees may contribute to readiness by reviewing data-generation processes, controls, governance responsibilities, and reporting systems, but they do not replace the independent assurance provider. This interpretation is aligned with evidence demonstrating that internal audit can provide both consulting and assurance support within sustainability reporting systems by strengthening internal control and information reliability (19). It is also consistent with Iranian professional perspectives emphasizing the necessity of both sustainability reporting and independent assurance to improve the credibility of disclosed information (20). Thus, the model clarifies the complementary but distinct roles of internal governance mechanisms and external assurance.

A further finding within organizational readiness concerned the use of digital technologies, data analytics, artificial intelligence, and measurement devices. The model does not treat technology use as inherently value enhancing; rather, the reliability of digital outputs depends on the quality of input data, validity of the analytical tool, reviewability

of outputs, and effective access and change controls. This finding reflects the increasing technical complexity of sustainability data, which may involve operational measurements, engineering estimates, value-chain information, emissions factors, and other nonfinancial metrics. Studies in sustainability-related production and environmental performance similarly emphasize that technical reliability and control over measurement processes are essential to credible sustainability outcomes (17). The present findings therefore suggest that digitalization can improve assurance efficiency only when supported by robust controls, traceability, and human review.

The third global theme, professional quality and design of the assurance engagement, identified independence, ethics, team competence, use of specialists, quality management, engagement acceptance, and assurance-level determination as central components of implementation. The findings showed that the assurance team must possess both assurance expertise and sustainability-related subject-matter knowledge and must assess conflicts of interest and independence threats throughout the engagement. This result corresponds with systematic research showing that practitioner type, professional expertise, and assurance-provider characteristics influence both the nature and perceived quality of sustainability assurance (6, 9). It also supports the view that sustainability assurance requires multidisciplinary capabilities because sustainability information often encompasses environmental, social, technological, and operational matters that extend beyond traditional financial accounting.

The importance assigned to professional education and competence in the present model is also consistent with prior research. Sustainability assurance introduces new competency requirements for auditors, including knowledge of reporting standards, nonfinancial measurement, ESG risks, value-chain information, and multidisciplinary evidence. Research addressing sustainability assurance in auditor education has emphasized that existing educational structures must evolve to prepare practitioners for such engagements (18). Similarly, the challenges observed in newly regulated sustainability assurance environments indicate that professional judgment becomes more difficult when practitioners lack experience with sustainability metrics, emerging reporting criteria, and limited-assurance methodologies (10). Therefore, the present study's emphasis on competency assessment, specialist involvement, and continuing education is supported both theoretically and empirically.

The fourth global theme, performance of assurance procedures and evaluation of evidence, demonstrates that the operational core of sustainability assurance lies in the logical connection among planning, materiality, risk assessment, evidence gathering, evaluation of estimates, and final judgment. The findings emphasize that the nature, timing, and extent of assurance procedures must be responsive to the selected level of assurance and to assessed risks of material misstatement. The model also distinguishes the materiality of sustainability matters for reporting purposes from the materiality of misstatement for assurance purposes. This distinction is important because sustainability reporting frameworks may require companies to identify material sustainability topics, whereas assurance practitioners must separately judge whether identified errors or omissions are material to the assurance conclusion. Prior sustainability assurance research has similarly emphasized that differences in scope, procedures, and assurance level affect the meaning and comparability of assurance statements (6, 7). The present findings operationalize this concern by requiring explicit linkage among risk, procedure, evidence, and conclusion.

The results further showed that sustainability assurance must account for estimates, measurement uncertainty, third-party data, value-chain information, and forward-looking disclosures. These elements increase evidential complexity because they may depend on assumptions, models, conversion factors, or external sources that are not directly controlled by the reporting entity. The need to assess the reliability of such information reflects the broader concern that sustainability disclosures may be more judgment-intensive and less standardized than traditional

financial information. Early studies of third-party environmental verification had already raised concerns about whether assurance procedures were sufficiently substantive to enhance credibility rather than merely provide symbolic validation (5). The legitimacy-theory perspective further suggests that firms may have incentives to use sustainability disclosure strategically to preserve legitimacy, which increases the importance of independent and evidence-based challenge by the assurance practitioner (4). Thus, the emphasis placed by the present model on contradictory evidence, measurement uncertainty, and professional skepticism responds directly to longstanding concerns regarding the credibility of sustainability disclosures.

The findings related to assurance evidence are also economically important because sustainability information increasingly affects decisions beyond reputational assessment. ESG performance has been associated with capital structure choices, financing behavior, and the speed with which firms adjust toward target capital structures (13). Evidence from Japan likewise indicates that ESG performance interacts with market competition in influencing capital structure outcomes (14). The emergence of ESG-oriented investors has even raised questions about whether conventional capital-structure relationships remain unchanged when investors incorporate sustainability preferences into asset pricing and financing decisions (15). Consequently, weak assurance over ESG information may have implications for resource allocation and financing decisions, while robust assurance can potentially reduce information uncertainty surrounding sustainability-related corporate characteristics.

The fifth global theme, independent reporting, communication, and improvement, showed that the usefulness of assurance depends heavily on transparent communication of the scope, period, criteria, assurance level, practitioner responsibilities, work performed, and conclusion. The model therefore requires a clear distinction between limited and reasonable assurance, transparent identification of the information covered, explanation of the basis for conclusion, and separate treatment of recommendations and the independent conclusion. This finding aligns with prior research showing substantial diversity in sustainability assurance report structure and content and indicating that users may find it difficult to distinguish among different types and levels of assurance (7, 8). Transparent reporting is therefore necessary to prevent users from assuming that the practitioner has verified information beyond the actual engagement scope.

The findings also indicate that sustainability assurance can contribute to organizational improvement when deficiencies identified during the engagement are communicated to management and addressed in subsequent reporting periods. This improvement function should not compromise practitioner independence, because responsibility for corrective action remains with management. Nevertheless, the assurance process may stimulate better documentation, stronger controls, clearer metric definitions, and more reliable reporting systems. This interpretation is consistent with evidence suggesting that assurance can affect the economic consequences of sustainability disclosure by increasing its perceived credibility. For example, assurance of CSR disclosures has been shown to affect buyer–seller decisions and interact with incentives for real CSR investment (16). Other research suggests that sustainability assurance can reinforce the relationship between corporate governance and firm performance by increasing confidence in ESG information (12). Accordingly, the improvement dimension of the present framework reflects both an assurance objective and a broader governance benefit.

The results should also be interpreted in the context of the increasing economic relevance of sustainability performance. ESG and sustainability considerations have become more strongly connected with corporate financial policy, stakeholder relationships, and market evaluation (1, 2). Standardized reporting and assurance can reduce information asymmetry, but their benefits depend on implementation quality and may be accompanied by

substantial compliance costs (3). The present model addresses this tension through phased implementation and readiness assessment. Rather than assuming that all organizations possess equal capacity to comply immediately, the model proposes pilot implementation, assessment of data readiness, documentation of deficiencies and costs, revision of implementation guidance, and gradual expansion. This approach is particularly relevant to Iran, where sustainability reporting practices, professional expertise, and institutional arrangements may differ substantially across companies and industries.

Overall, the findings support the conclusion that sustainability assurance in Iran should be implemented as a coordinated system rather than as an isolated audit-style procedure. The model integrates institutional governance, organizational readiness, professional competence, evidence-based engagement performance, transparent reporting, and continuous improvement. This comprehensive structure is consistent with systematic reviews that describe sustainability assurance as a multidimensional practice affected by institutional, professional, and organizational factors (9, 23). It also responds to Iranian research identifying the need for clearer assurance requirements, stronger professional infrastructure, and implementation mechanisms adapted to domestic conditions (21, 22). By translating ISSA 5000 requirements into responsibilities, activities, documentation, and assessable outputs, the proposed framework provides an operational bridge between international assurance principles and the specific institutional and organizational conditions of sustainability reporting in Iran.

The present study has several limitations that should be considered when interpreting its findings. First, the qualitative field phase was based on interviews with eight experts selected purposively because of their specialized knowledge and extensive professional experience. Although this approach was appropriate for generating detailed and contextually informed insights, the limited number of participants restricts the statistical generalizability of the findings. Second, the documentary corpus was intentionally selected to represent major standards, professional guidance, corporate assurance reports, and relevant academic studies; therefore, it did not encompass every available sustainability assurance framework, national regulation, or industry-specific practice. Third, the proposed model was developed during a period in which sustainability reporting and assurance requirements are undergoing rapid international development, meaning that future changes in standards, regulation, technology, and professional practice may require revision of some components. Finally, the framework has not yet been tested through large-scale implementation in Iranian organizations, and therefore its feasibility, cost, and operational effectiveness across industries require further empirical validation.

Future studies should quantitatively validate the proposed model using a broader sample of auditors, sustainability professionals, managers, regulators, internal auditors, and academics and should assess the relative importance, feasibility, and priority of the identified components. Structural equation modeling or other multivariate techniques could be used to examine the relationships among institutional readiness, organizational data quality, professional competence, assurance-process quality, and reporting credibility. Comparative studies across industries could determine whether the proposed components operate differently in sectors characterized by high environmental impacts, complex value chains, or advanced digital reporting infrastructures. Future research may also compare the Iranian implementation framework with models adopted in other emerging economies and jurisdictions implementing mandatory sustainability assurance. Longitudinal research would be valuable for assessing changes in organizational readiness and assurance quality after pilot implementation. In addition, experimental and behavioral studies could investigate how different formulations of assurance conclusions, levels

of assurance, or disclosures about evidence limitations influence investors' and other users' perceptions and decisions.

For practical implementation, policymakers and professional bodies should first clarify institutional responsibilities for sustainability assurance standard setting, practitioner qualification, quality oversight, and enforcement and should develop coordinated implementation guidance consistent with ISSA 5000. Reporting entities should conduct formal readiness assessments before seeking assurance and should establish clear data ownership, metric definitions, reporting boundaries, calculation methodologies, documentation requirements, and internal controls over sustainability information. Audit firms and other eligible assurance practitioners should develop multidisciplinary teams, continuing professional education programs, specialist networks, and engagement-specific quality management procedures. Pilot assurance engagements should initially focus on organizations with relatively mature sustainability data systems, and lessons from these engagements should be systematically documented and used to refine national guidance. Companies should also strengthen coordination among sustainability functions, finance departments, internal audit, information technology units, operational departments, audit committees, and senior management so that evidence can be traced efficiently from source systems to final disclosures. Finally, recommendations arising from assurance engagements should be incorporated into structured remediation plans, while responsibility for decision-making and corrective actions should remain clearly with management.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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