



Evaluation, supervision, and accountability for sustainable education financing governance

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ABSTRACT

Background: Evaluation, supervision, and accountability are essential foundations for effective, efficient, transparent, and sustainable governance of educational funding. Strengthening these functions is particularly important for maintaining public trust and sustaining long-term educational quality and institutional resilience in Indonesia. **Methods:** This study used a descriptive-analytical approach to examine three key aspects of sustainable educational funding governance: the concept and function of supervision, control mechanisms to ensure effective and sustainable program implementation, and the forms and standards of financial accountability. **Findings:** Supervision serves as a managerial instrument to ensure consistency between educational planning and budget realization, while control functions as a corrective mechanism that maintains the quality, efficiency, and sustainability of program implementation. Financial accountability is demonstrated through the *Rencana Kegiatan Anggaran Sekolah (RKAS)*, the school activity and budget plan; budget realization reports; and internal and external audits. Integrating these mechanisms strengthens transparency, compliance, and responsible, sustainable financial management. **Conclusion:** Synergy among evaluation, supervision, control, and accountability is a fundamental prerequisite for improving the sustainable governance of educational funding, strengthening public trust, and supporting the long-term sustainability of educational quality in Indonesia. **Novelty/Originality of this article:** This study emphasizes an integrated governance framework that links supervision, control, and accountability as mutually reinforcing mechanisms to strengthen sustainable educational funding management and institutional accountability.

KEYWORDS: education; evaluation; financing.

1. Introduction

Educational development in Indonesia carries the mission of achieving educational equity while significantly improving the quality of human resource development (Elmi & Librianty, 2023; Indrawati & Kuncoro, 2021; Kawuryan et al., 2021). The global era has introduced a new paradigm across various aspects of life, resulting in the requirement that every country participate in global competition. In the context of educational administration, both at the macro level (national) and the micro level (institutional), financing is regarded as a crucial issue, as it constitutes an indispensable element. For example, in accordance with statutory mandates, the Government of the Republic of Indonesia annually allocates at least 20% of the total State Budget (*Anggaran Pendapatan*

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dan Belanja Negara) to education. Similarly, local governments allocate annual educational budgets, including expenditures for teachers' salaries and other educational personnel at the regional level (Joshi, 2023; Farmer & Weber, 2022; Sumiyana & Effendi, 2024).

The utilization of funds within an educational institution reflects a financing pattern that has been systematically designed and planned in accordance with the APBN. Therefore, at all levels of educational administration, educational financing plays a vital role in ensuring the implementation of education. Education cannot function without adequate financial resources. Educational financing represents efforts to support both the operational and developmental aspects of education in order to enhance the quality of human resources, thereby enabling collaboration at the local, regional, national, and even international levels (Huda et al., 2020).

Therefore, achieving the aforementioned objectives requires the evaluation of educational financing management, which constitutes a crucial step in ensuring that financial resources allocated to educational institutions are utilized effectively, efficiently, transparently, and accountably, thereby generating a tangible impact on the improvement of educational service quality. Without systematic evaluation, budget planning and implementation may easily deviate from educational priorities, such as discrepancies between fund allocation and the needs for infrastructure, curriculum development, or teacher welfare, which may ultimately reduce student learning outcomes and institutional sustainability (Syahrizal, 2025).

Evaluation also functions as a feedback mechanism that provides evidence for policymakers (schools, committees, and education authorities) to improve funding policies, enhance reporting transparency e.g., School Activity and Budget Plan/*Rencana Kegiatan dan Anggaran Sekolah* (RKAS) or School Operational Assistance/*Bantuan Operasional Sekolah* (BOS), and optimize financial risk management in the future. Therefore, incorporating an evaluative study of financing management into research is essential to identify management gaps, recommend operational improvements, and ensure the sustainability of educational programs aimed at enhancing quality (Baidowi et al., 2024).

Within this evaluative process, supervision, control, and accountability are conventionally treated in the literature as three distinct managerial instruments rather than as an integrated chain of governance. Supervision is generally conceptualized as a subset of the broader managerial control function, encompassing internal, external, and participatory forms of oversight aimed at detecting and correcting deviations in program implementation (Kartiko et al., 2024; Mariani et al., 2025; Zulkarnaen, 2021). Control, in turn, is described as a logical continuation of supervision, involving the establishment of performance standards, ongoing monitoring and evaluation, and corrective action (Yusran et al., 2022). While both functions are well documented individually, few studies explicitly examine how supervision and control operate as a continuous, mutually reinforcing process within the specific context of school-level financing.

Empirically, this conceptual gap is compounded by persistent practical challenges in educational financing accountability. Recent studies on the management of School Operational Assistance (BOS) funds in Indonesian public schools indicate that although schools generally comply with formal accountability standards such as budgeting, reporting, and internal oversight, the implementation of transparency remains inconsistent due to limitations in information dissemination and financial literacy (Munjiah & Daud, 2024). Case-level evidence further shows that even where internal accountability mechanisms function adequately, the dissemination of financial information to the wider school community is often inactive or underutilized (Lubis et al., 2024). A recent systematic literature review quantifies this pattern, finding that accountability and transparency contribute 52.7% and 51.2%, respectively, to the overall effectiveness of BOS fund management, while common obstacles include delayed fund disbursement and technical errors in RKAS/ARKAS reporting. These findings underscore the need for a more integrative understanding of how supervision, control, and accountability jointly shape financing outcomes at the school level.

Beyond these conventional managerial and fiscal dimensions, the accelerating global commitment to reducing carbon emissions and transitioning toward low-carbon economic growth increasingly requires that educational financing be evaluated not only through traditional efficiency and accountability indicators, but also through an environmental sustainability lens (Zheng et al., 2024; Gbadeyan et al., 2024; Liu & Sander, 2026). As Indonesia's education sector increasingly aligns with the Sustainable Development Goals (SDGs) and national green economy agendas, including green budgeting frameworks issued by the Ministry of Finance and Bappenas, the functions of supervision, control, and accountability in educational financing must be reconceptualized to incorporate ecological considerations alongside their traditional managerial roles.

Taken together, these observations reveal two interrelated gaps in the existing literature: first, supervision, control, and accountability continue to be studied largely as separate managerial functions rather than as an interconnected governance chain; and second, the growing relevance of green economy principles such as green budgeting, green accounting, and environmental impact assessment to educational financing remains underexplored, particularly within the Indonesian context. This study addresses both gaps by proposing an integrative framework that connects conventional financial governance with emerging sustainability dimensions.

Accordingly, this study aims to answer the following research questions: (1) How do supervision and control function as interconnected mechanisms in educational financing management? (2) How is accountability realized and evidenced in current educational financing practices in Indonesia? (3) How can green economy principles be integrated into the supervision, control, and accountability of educational financing to support sustainable educational governance? The remainder of this paper is organized as follows: Section 2 describes the research methodology; Section 3 presents and discusses the findings organized around these three research questions; and Section 4 concludes with the study's key contributions and directions for future research.

2. Methods

This study employed a qualitative descriptive approach aimed at analyzing and comprehensively describing the processes of evaluation, supervision, and accountability in educational financing management. This approach was selected because it is capable of explaining managerial phenomena and educational financial governance contextually, based on the researchers' interpretation of empirical data and relevant literature.

2.1 Research type and approach

This research is a library study (library research) supported by conceptual and normative analyses of educational financing policies (Schalkwyk & Antwerpen, 2025; Sari et al., 2025). This approach was used to examine educational management theories, public accountability concepts, as well as supervision and financial reporting standards in educational institutions from various scholarly sources, including books, journal articles, government reports, and statutory regulations.

The unit of analysis in this study is the school-level educational financing governance process, encompassing supervisory practices, control mechanisms, and accountability instruments as they are conceptually and normatively described in Indonesian educational policy and prior academic literature, rather than the direct financial records of a specific institution. This library-research design was chosen over a field-based or survey approach because the primary objective of this study is to construct an integrative conceptual framework connecting three managerial functions supervision, control, and accountability with an emerging fourth dimension, namely green economy principles, a synthesis that is best achieved through systematic document and literature analysis rather than primary data collection from a single case.

2.2 Data sources

Specifically, the primary policy documents reviewed in this study include Law No. 20/2003 on the National Education System, Government Regulation No. 48/2008 on Education Funding, and the Regulation of the Minister of Education and Culture No. 6/2021 concerning Technical Guidelines for the Management of Regular School Operational Assistance Funds (BOS Reguler), together with RKAS/ARKAS reporting guidelines issued by the Ministry of Education, Culture, Research, and Technology. These primary sources were supplemented by six recent peer-reviewed studies (2022–2026) examining educational financing accountability and green economy integration (see Table 1), selected for their direct relevance to the study's dual focus on conventional financial governance and emerging sustainability dimensions.

Table 1. Key reference sources supporting this study

Key insight	Authors & year
Schools generally comply with accountability standards (budgeting, reporting, internal oversight), but transparency implementation remains inconsistent due to gaps in information dissemination and financial literacy	Munjiah & Daud (2024)
Evaluates BOS fund management using Wirawan's input–process–output–impact framework	Mehan et al. (2024)
Case study showing internal BOS accountability mechanisms function, but information dissemination to the wider school community (e.g., via school website) is often inactive	Lubis et al. (2024)
Quantifies BOS fund management effectiveness: accountability contributes 52.7%, transparency 51.2%, community participation 53.9%; common obstacles are fund disbursement delays and RKAS/ARKAS technical errors	Sulistyo et al. (2026)
Institutional readiness for green accounting is uneven; low-cost measures are adopted more easily than large-scale investments like renewable energy	Asis et al. (2026)
Regulatory quality significantly moderates the effectiveness of green budget tagging on sustainable development outcomes in Indonesia	Siska et al. (2025)

2.3 Data collection techniques and data analysis techniques

Data were collected using the following methods: first, documentation, namely reviewing official documents such as BOS reports, educational financing management guidelines, and school audit reports. Second, literature study, namely collecting theories and findings from previous studies to strengthen the conceptual foundation. Last, content analysis was used to examine the conformity between the principles of supervision, control, and accountability and the actual practices of financing management in educational institutions.

Data analysis was conducted through three stages according to Miles & Huberman (1994): data reduction, namely selecting and categorizing important information related to supervisory functions, control systems, and forms of accountability. 2) Data display, namely organizing the analysis results in descriptive narrative and conceptual table formats to clearly illustrate the relationships among variables. 3) Conclusion drawing, conducted inductively to formulate effective managerial principles for achieving accountable and transparent educational financing. To ensure analytical consistency, the findings from the reviewed documents and literature were compared to identify recurring themes, conceptual relationships, and potential gaps between established principles and reported practices. The resulting synthesis was then used to develop an integrated understanding of how supervision, internal control, and accountability can strengthen the transparency and effectiveness of educational financing management.

2.4 Data validity

To ensure data validity, this study employed source triangulation by comparing information obtained from various documents, previous research findings, and official regulations. Validity was further strengthened through peer review of the consistency between the analysis and nationally applicable educational financing management principles. Through this method, the study is expected to provide a comprehensive understanding of how the processes of evaluation, supervision, and accountability in educational financing can be integrated to improve the effectiveness of financial governance in educational institutions.

In addition to source triangulation, this study applied methodological consistency checks by cross-referencing the terminology and classification used across the primary policy documents (e.g., RKAS/ARKAS guidelines) with the terminology used in the reviewed academic literature, to ensure that concepts such as accountability, green budget tagging, and environmental impact assessment were interpreted consistently throughout the analysis. This step was particularly important given that the study synthesizes two bodies of literature conventional educational financing governance and green economy studies that do not always share identical terminology or units of measurement.

3. Results and Discussion

3.1 Supervision and control as an interconnected governance mechanism in educational financing

Supervision, as a component of the management process, plays an important role in achieving established objectives and is carried out throughout program implementation until activities are completed. The term supervision encompasses several activities, including inspection, control, and evaluation; based on this definition, when discussing supervision, control activities are inherently involved (Kartiko & Rofiq, 2024). Supervision as a managerial instrument. In the field of education, the term supervision is more commonly associated with oversight conducted by a supervisor to assist teachers in guiding teaching and learning processes. Although both terms are considered similar in practice, there are conceptual differences: supervision tends to refer to one of the managerial roles known as controlling, and can therefore be understood as a subset of the broader control function, a process ensuring that activities remain aligned with predetermined plans (Baidowi et al., 2024).

The results of this study indicate that supervision is one of the essential functions in educational financing management, ensuring that all activities are carried out in accordance with institutional plans, standards, and objectives. Supervision not only detects deviations but also serves as a means of guidance and professional development for educators and administrative staff. In the context of educational institutions, supervision is divided into three main models: (1) internal supervision, conducted by the principal or internal institutional committee to ensure budget implementation aligns with the plan; (2) external supervision, conducted by government institutions, inspectorates, or independent auditors to ensure regulatory compliance; and (3) participatory supervision, involving the community, parents, and school committees to enhance transparency and a sense of ownership.

Through supervision, deviations in implementation, such as in fund utilization, curriculum implementation, or teacher services, can be detected at an early stage, enabling corrective actions to realign implementation with the initial plan (Zulkarnaen, 2021). More broadly, supervision also aims to establish transparent and accountable governance within educational institutions, giving stakeholders (school management, teachers, committees, and the community) confidence that resources are managed responsibly and in accordance with shared objectives (Yusran et al., 2022).

Control as a continuation of supervision. The control system in education is a series of processes designed to ensure that all educational activities, both academic and administrative, are implemented in accordance with predetermined plans, standards, and objectives; this includes monitoring implementation, comparing results with performance indicators, and taking corrective action when deviations are identified (Syahrizal, 2025). In the context of education management, control is not limited to financial aspects but also encompasses learning quality, educator performance, infrastructure management, and overall institutional governance (Baidowi et al., 2024). The control system also carries preventive and developmental dimensions: the preventive dimension helps avert errors before they negatively affect educational quality, while the developmental dimension provides data for quality improvement, re-planning, and policy refinement.

The analysis shows that control is a logical continuation of the supervisory function, consisting of three main stages: (1) establishment of standards and performance indicators, such as learning quality, budget utilization efficiency, and educator performance; (2) monitoring and evaluation (M&E), namely collecting and analyzing data on program implementation to determine effectiveness and efficiency; and (3) corrective actions and recommendations, carried out based on evaluation results to address weaknesses, adjust budgets, and improve institutional governance. Taken together, these findings directly answer RQ1: supervision and control do not operate as isolated instruments, but as a sequential and mutually reinforcing cycle, supervision detects and guides, while control standardizes, monitors, and corrects, jointly ensuring that budget realization remains aligned with institutional plans and that educational quality, cost efficiency, and financial integrity are maintained.

Nonetheless, the effectiveness of this supervision–control cycle is not without practical constraints. Prior studies note that the capacity of school-level supervisors and internal committees to conduct rigorous, ongoing monitoring is often limited by workload, insufficient training in financial oversight, and unclear delineation of authority between internal school committees and external inspectorates. These capacity gaps suggest that the conceptual sequence of supervision leading into control, while analytically sound, requires sufficient institutional capacity at the school level to function as intended in practice, an issue that becomes especially relevant when this governance chain is later extended to incorporate ecological considerations in Section 3.3.

3.2 Accountability of educational financing: Concept and empirical evidence

The concept of accountability in educational financing refers to the obligation of every educational institution, fund manager, and policy stakeholder to explain, report, and demonstrate that funds received have been used transparently, efficiently, effectively, and in accordance with intended objectives. Accountability is not only an administrative matter but also concerns public trust that the use of education funds genuinely supports the improvement of educational service quality (Ritonga, 2025). Accountability comprises several key elements: (1) transparency, the delivery of financial information in an open, comprehensible, and accessible manner; (2) responsibility, the alignment of fund management with institutional duties and applicable regulations; (3) public accountability, the obligation of schools to report fund usage to the community, government, and other stakeholders; and (4) integrity, emphasizing honesty, administrative orderliness, and compliance with fund management standards. In practice, accountability is realized through instruments such as the School Activity and Budget Plan (RKAS), budget realization reports, financial accountability reports/*Laporan Pertanggungjawaban* (LPJ), and internal and external audit reports, which together must meet standards of consistency, reliability, transparency, timeliness, compliance, and integrity of the preparers.

The implementation of accountability is essential because it underpins the effectiveness of education budget management, ensures funds are genuinely used to improve educational services, provides a basis for policy evaluation and future budget planning, prevents irregularities, and strengthens public trust and good school governance. Empirical evidence

on BOS fund accountability. Recent studies provide empirical grounding for these conceptual claims. Evidence from Indonesian public elementary schools shows that schools generally comply with formal accountability standards, budgeting, reporting, and internal oversight, yet the implementation of transparency remains inconsistent, constrained by limited information dissemination and financial literacy among fund managers (Munjiah & Daud, 2024). Case-level findings similarly show that while internal accountability procedures function adequately, the dissemination of financial information to the wider school community, for instance through school websites, is frequently inactive or underutilized (Lubis et al., 2024). A recent systematic literature review quantifies these patterns across multiple Indonesian studies, as summarized in Table 2 below.

Table 2. Empirical findings on BOS fund accountability and transparency in Indonesia		
Aspect	Contribution / Finding	Source
Accountability	Contributes 52.7% to the overall effectiveness of BOS fund management	Sulistyo et al. (2026)
Transparency	Contributes 51.2% to the overall effectiveness of BOS fund management	Sulistyo et al. (2026)
Community participation	Contributes 53.9% to the overall effectiveness of BOS fund management	Sulistyo et al. (2026)
Main obstacles	Delayed fund disbursement; technical errors in RKAS/ARKAS reporting; limited understanding of technical guidelines at the school level	Sulistyo et al. (2026)
Internal vs. external transparency gap	Internal accountability mechanisms generally function, but dissemination of financial information to the wider community (e.g., via school websites) is often inactive	Lubis et al. (2024)
Compliance vs. transparency gap	Schools generally comply with accountability standards (budgeting, reporting, internal oversight), but transparency implementation remains inconsistent	Munjiah & Daud (2024)

These findings directly answer RQ2: accountability in Indonesian educational financing is substantively realized through formal instruments (RKAS, LPJ, audits) and is empirically the strongest contributor to fund management effectiveness among the three dimensions measured, yet its practical implementation is undermined by persistent gaps in transparency and community-facing information dissemination, indicating that formal compliance alone is insufficient without parallel investment in disclosure capacity and stakeholder communication.

These accountability gaps also carry direct implications for the green economy integration discussed in the following section: if conventional financial accountability mechanisms already struggle with transparency and community-facing disclosure, then extending accountability to cover ecological dimensions such as environmental cost reporting is likely to encounter similar, or potentially greater, implementation challenges unless accompanied by capacity-building measures for school financial managers.

3.3 Integrating green economy principles into supervision, control, and accountability

In the conventional development economics paradigm, educational financing management is often viewed as an instrument for achieving allocative efficiency, administrative transparency, and fiscal accountability. However, amid the global climate crisis and the transition toward a low-carbon economy, investment in the education sector needs to be reconsidered through the perspective of green development economics. This perspective broadens the objectives of educational financing beyond conventional academic outcomes to encompass environmental sustainability, green human capital development, and the efficient use of natural resources.

Green human capital accumulation represents one of the key mechanisms through which educational financing can contribute to sustainable development. Education plays a central role in human capital formation, while the green economy perspective emphasizes the development of competencies relevant to environmental sustainability. Accordingly, school financing should not be directed solely toward developing general cognitive competencies but should also support green skills through sustainability-oriented curricula, clean technology training, and ecological literacy. These investments can help prepare graduates for evolving labor markets characterized by circular economic practices and low-emission industries (Kaushiva, 2025).

Green budgeting and eco-efficiency provide another important dimension of sustainable educational financing. Whereas conventional financial management often defines efficiency in terms of minimizing monetary costs relative to outputs, the green economy perspective extends this concept by incorporating environmental impacts and life-cycle costs into budgetary decisions. In this context, the School Activity and Budget Plan/*Rencana Kegiatan dan Anggaran Sekolah* (RKAS) can incorporate green procurement, energy-efficient infrastructure, renewable energy installations such as solar panels, and digital reporting systems, including the School Activity and Budget Planning Application/*Aplikasi Rencana Kegiatan dan Anggaran Sekolah* (ARKAS), to reduce paper consumption and improve administrative efficiency (Niekerk, 2024). Although green technologies may require higher initial investment, their adoption can potentially reduce long-term operating expenditures and environmental impacts. Such investments should therefore be assessed according to their life-cycle costs, expected savings, and feasibility within the financial capacity of individual educational institutions.

Furthermore, ecological accountability extends the supervisory and accountability functions of educational financing beyond legal and financial compliance to include environmental responsibility. Through green accounting and green auditing practices, educational institutions can monitor and report the environmental implications of their operational activities while ensuring that public funds, including School Operational Assistance/*Bantuan Operasional Sekolah* (BOS) funds, are managed transparently and responsibly. This approach is consistent with recent findings in higher education contexts indicating that institutional readiness to implement green accounting remains uneven. Low-cost measures, such as basic energy-saving practices, are generally more readily adopted than capital-intensive investments in renewable energy infrastructure, which may be constrained by limited funding and inadequate facilities (Asis et al., 2026). These findings suggest that schools may also benefit from prioritizing incremental, affordable environmental accountability measures before undertaking more capital-intensive green investments, although this implication requires further investigation in school settings.

Sustainable resource management further reinforces the relationship between educational financing and environmental performance. In educational institutions, this involves planning and utilizing financial resources, energy, water, and infrastructure with long-term efficiency in mind. Practical measures include improving energy efficiency through appropriate lighting systems, evaluating the feasibility of renewable energy installations, procuring digital learning facilities to reduce paper consumption, and adopting procurement procedures that consider life-cycle costs rather than initial purchase prices alone. School waste management can also be integrated with environmental education initiatives, including eco-school and green campus programs. Accordingly, financial supervision and internal control should assess not only administrative compliance and expenditure accuracy but also the efficiency of resource use and the environmental implications of institutional operations.

The integration of these practices creates potential linkages between sustainable educational financing and green economic growth. Human capital is an important determinant of technological innovation and the diffusion of environmentally sustainable practices. When educational financing supports green skills development, sustainability-oriented curricula, and collaboration with relevant stakeholders, educational institutions can contribute to developing the competencies required by low-carbon industries and

environmentally responsible economic activities. This mechanism may support productivity improvements and a gradual transition toward economic growth that is less dependent on carbon-intensive activities (Inesa et al., 2021). In practical terms, such integration can be pursued through budget allocations for green economy-oriented curricula, partnerships with local governments and the private sector to develop eco-school models, and appropriately designed fiscal incentives for schools that demonstrate improvements in energy efficiency and resource conservation. Nevertheless, the extent to which these initiatives generate measurable economic benefits depends on implementation quality, institutional capacity, and the availability of supporting policies.

Policy frameworks and sustainable governance are essential for integrating environmental considerations into educational financial management. The transition toward green budgeting at the educational institution level requires a coherent regulatory foundation that aligns educational financial governance with national fiscal priorities and climate action objectives. Within this framework, educational institutions can adopt a green budget tagging mechanism to classify activities in the School Activity and Budget Plan/*Rencana Kegiatan dan Anggaran Sekolah* (RKAS) into green (environmentally beneficial), gray (environmentally neutral), and red (potentially environmentally harmful or high-risk) categories (Kurrohman & Oktaviani, 2025). This classification provides a basis for identifying budget allocations according to their potential environmental implications, as summarized in Table 3.

Empirical evidence from Indonesia further indicates that the effectiveness of green budget tagging in advancing sustainable development outcomes is significantly moderated by the quality of the surrounding regulatory framework (Siska et al., 2025). This suggests that successful implementation requires not only clear classification criteria but also consistent regulatory oversight, adequate institutional capacity, and accountability mechanisms at both national and regional levels. Relevant policy frameworks that can support this integration include the National Long-Term Development Plan/*Rencana Pembangunan Jangka Panjang Nasional* (RPJPN), particularly its priorities related to SDG 4 (Quality Education) and SDG 13 (Climate Action), as well as green economy frameworks promoted by the Ministry of Finance and the Ministry of National Development Planning/National Development Planning Agency (Bappenas). At the institutional level, the Adiwiyata School Program and green campus policies can provide complementary foundations for integrating environmental considerations into educational planning, budgeting, and operational management.

Table 3. Green budget tagging categories for school activity and budget plans (RKAS)

Category	Description	Example school budget items
Green	Activities that directly reduce environmental impact or actively support sustainability	Solar panel installation, energy-efficient lighting, ARKAS digital reporting, environmental education curriculum, waste management programs
Gray (Neutral)	Activities with no significant direct environmental impact	Routine administrative expenditure, standard teaching materials, teacher and staff salaries
Red (High-risk)	Activities with potential negative environmental impact requiring mitigation or EIA/AMDAL	Large-scale construction without EIA, non-renewable energy-dependent infrastructure, high-waste-generating procurement

Environmental impact dimension. The assessment of environmental impact in education financing requires a shift from one-dimensional financial reporting to Green Accounting integrated with institutional social responsibility principles, including calculation of environmental costs such as emission loads from energy consumption, waste volume, and spatial planning impact on local ecosystems (Pronika et al., 2021). In financing large-scale infrastructure projects such as school reconstruction, the approval of capital expenditure budgets must be preceded by a comprehensive Environmental Impact

Assessment/*Analisis Mengenai Dampak Lingkungan* (EIA/AMDAL), as mandated under Indonesia's Law No. 32/2009 on Environmental Protection and Management for infrastructure projects with potentially significant environmental impact (Mohamad et al., 2022). EIA in education financing functions to map and mitigate ecological risks, deforestation of school green areas, water quality degradation, and noise pollution, from pre-construction through long-term operational phases. Through this approach, educational institutions are encouraged to implement EIA for construction and renovation projects, Green Accounting to assess the environmental impact of energy, water, and waste use, and Carbon Tracking to monitor greenhouse gas emissions from school operations. Table 4 synthesizes how these four green economy dimensions collectively reshape educational financing governance.

Table 4. Dimensions of green economy integration in educational financing management

Dimension	Main focus	Implications for education financing
Sustainable resource management	Efficiency and conservation of resources (energy, water, materials)	Ecologically efficient budgeting
Green economic growth	Education as a driver of the green economy	Educational investment supports green human capital
Policy frameworks	Adiwiyata policy, SDGs, Green Budgeting Framework	Synergy between financial and environmental regulation
Environmental impact	Evaluation of the ecological impact of each activity	Integrated financial and ecological accountability

Despite its conceptual promise, the integration of green economy principles into educational financing management faces several practical barriers. First, most Indonesian schools currently lack technical guidelines specifically detailing how to calculate environmental costs or classify budget items under a green, gray, or red tagging system, meaning that implementation would likely depend on additional regulatory clarification from the Ministry of Education, Culture, Research, and Technology in coordination with the Ministry of Finance. Second, capital-intensive green investments such as solar panel installation or comprehensive EIA/AMDAL processes for infrastructure projects require funding and technical expertise that may not be readily available at the school level, particularly in resource-constrained regions. This is consistent with recent evidence from higher education institutions, where low-cost ecological measures are adopted more readily than large-scale green infrastructure investments due to financial and facility constraints (Asis et al., 2026). Third, the human capital dimension of this framework—training school financial managers and educators in green budgeting and green accounting practices—represents a long-term capacity-building effort rather than an immediate policy fix. These constraints do not undermine the conceptual validity of the integrative framework proposed in this study; rather, they indicate that its practical implementation should proceed incrementally, beginning with low-cost administrative measures such as green budget tagging and digital reporting, before progressing toward capital-intensive investments as institutional capacity and regulatory clarity improve.

Figure 1 presents the conceptual framework developed in this study. The framework illustrates the sequential relationship between supervision, control, and accountability while positioning green economy integration as a cross-cutting principle that strengthens and supports each governance function. Rather than acting as an independent component, green economy integration is embedded throughout the governance process to promote sustainability-oriented public administration.

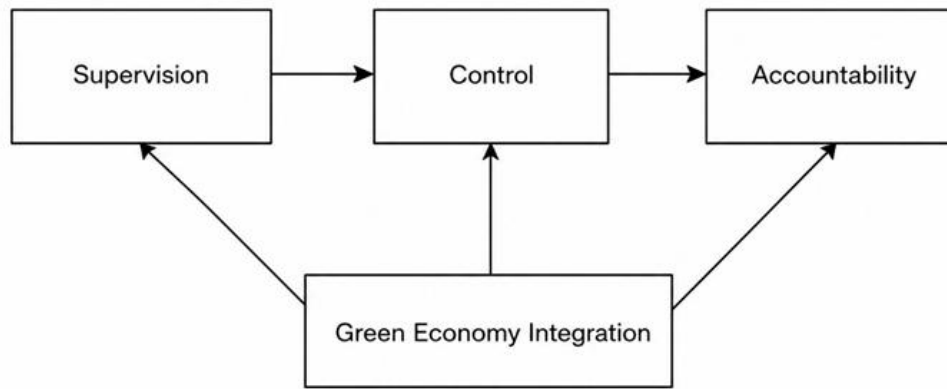


Fig. 1. Conceptual framework of supervision, control, accountability, and green economy integration

As illustrated in Figure 1, effective governance begins with supervision, which provides continuous monitoring and assessment of organizational activities. The information generated through supervision supports control mechanisms by enabling corrective actions and ensuring compliance with established policies and regulations. These processes subsequently contribute to accountability by promoting transparency, responsibility, and answerability for organizational performance. Green economy integration underpins all three governance functions by incorporating sustainability principles into decision-making, resource management, and institutional practices. Consequently, the framework emphasizes that environmental sustainability is not an additional objective but an integral element that reinforces governance effectiveness and long-term organizational resilience.

Taken together, these findings answer RQ3: green economy principles can be systematically integrated into educational financing governance by embedding eco-efficiency into budgeting (green budget tagging), expanding accountability into ecological auditing (green accounting), and requiring environmental risk assessment (EIA/AMDAL) prior to major capital expenditure—collectively transforming supervision, control, and accountability from purely fiscal instruments into active ecological policy instruments. The integration of these sustainability aspects expands the paradigm of oversight and accountability from mere financial transparency to ecological accountability, positioning educational institutions as important actors in Indonesia's transition toward a green economy and sustainable development.

The findings have several practical implications for educational financing governance. School administrators should complement accountability instruments, such as RKAS and budget realization reports, with accessible public disclosure through school websites or community bulletin boards. Policymakers should develop technical guidelines for implementing green budget tagging and green accounting at the school level to support consistent adoption across educational institutions. Meanwhile, local governments can prioritize affordable measures, such as digital financial reporting through ARKAS and basic energy-efficiency practices, before requiring capital-intensive investments. These measures can facilitate the integration of sustainability into educational financing while accommodating differences in institutional financial capacity.

This study has limitations. As a library-based study, its findings derive from conceptual and normative analyses of policy documents and previous literature rather than primary empirical data collected from schools, education offices, or financial managers. Moreover, literature specifically addressing green economy integration in Indonesian educational financing remains limited, requiring some arguments to draw on related contexts, including higher education and local government budgeting. Therefore, the proposed framework requires empirical validation. Future research could examine schools that have implemented green budget tagging and use quantitative surveys to assess the relationship between green economy integration and educational financing accountability across different regions and school types.

4. Conclusions

This study demonstrates that supervision, control, and accountability are interconnected functions that support effective and transparent educational financing management. Supervision monitors budget implementation and provides guidance, while control ensures compliance, consistency, and corrective action. Accountability, through instruments such as RKAS, budget realization reports, and internal and external audits, promotes responsible financial management. Addressing the integration of green economy principles into educational financing governance, this study highlights how eco-efficiency in budgeting, green accounting, ecological auditing, and environmental impact assessments can extend accountability beyond fiscal compliance toward ecological responsibility.

The study contributes a conceptual governance framework that integrates financial accountability and environmental sustainability to support educational quality, institutional resilience, and Indonesia's sustainable development agenda, including the Sustainable Development Goals (SDGs). The framework positions environmental responsibility as an integral component of educational financing governance rather than an additional administrative obligation. However, its practical effectiveness remains to be established through empirical research across diverse educational institutions and contexts. Future studies should examine how these integrated governance mechanisms are implemented in practice and identify the institutional factors that facilitate or constrain their adoption. Further research should also develop measurable indicators to assess the relationship between environmentally responsible educational budgeting, financial accountability, and sustainability outcomes.

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Author Contribution

Conceptualization, C.N.F. and A.M.; Methodology, C.N.F. and F.S.A.; Formal Analysis, C.N.F. and F.S.A.; Investigation, C.N.F. and F.S.A.; Writing – Original Draft, C.N.F. and F.S.A.; Writing – Review & Editing, A.M.; Supervision, A.M.

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Data Availability Statement

Not available.

Conflicts of Interest

The authors declare no conflict of interest.

Declaration of Generative AI Use

During the preparation of this work, the authors used Grammarly to improve grammar, clarity, and academic tone; Claude to assist with language refinement and manuscript

development; and Consensus to support the identification and review of relevant scholarly literature. After using these tools, the authors critically reviewed and edited the content as necessary and take full responsibility for the accuracy, integrity, and final content of the publication.

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