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# Sustainability Management in Business Organizations: Examining the Impact of Managerial Policies on Natural Resource Conservation and Water Efficiency

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**ABSTRACT**

*Natural resource depletion and water scarcity have become central sustainability challenges for business organizations. Firms are increasingly expected to adopt managerial policies that reduce their dependence on finite resources while improving stewardship of water and related ecological systems. Although many organizations now publish sustainability policies, the pathways through which these policies influence conservation and water efficiency remain conceptually fragmented. Existing work often emphasizes reporting, disclosure, or isolated environmental practices rather than the managerial policy mechanisms that organize implementation. This article proposes a conceptual framework linking managerial policies to natural resource conservation and water efficiency outcomes. The model identifies strategic intent, target-setting, operational controls, and incentive systems as core policy dimensions that can shape conservation-oriented capabilities and practices. The framework comprises a policy typology, resource conservation implementation mechanisms, water stewardship practices, and mediating factors such as leadership commitment, organizational culture, stakeholder engagement, and institutional pressure. Together, these components clarify how policy design could translate sustainability aspirations into coordinated managerial action. The framework provides a diagnostic lens for managers seeking to assess policy coherence and redesign conservation interventions. It also offers researchers a structured model for examining policy-practice-performance linkages in corporate environmental strategy. A systematic policy framework can help embed natural resource conservation and water efficiency into the core of sustainability management. By aligning strategic commitments, operational routines, and managerial accountability, firms can strengthen their capacity for responsible resource stewardship.*

**Keywords:** *Sustainability management, Managerial policies, Natural resource conservation, Water efficiency, Corporate environmental performance, Resource stewardship*

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## INTRODUCTION

Natural resource depletion, water stress, biodiversity loss, and rising material demand have intensified the responsibility of business organizations to manage their ecological footprint. Corporate operations depend on energy, raw materials, land, ecosystem services, and reliable water supplies, making resource conservation both an environmental imperative and a strategic management concern. Research on corporate water accounting, water disclosure, and resource productivity shows that environmental performance increasingly depends on how firms understand, measure, and govern their resource use (Burritt & Christ, 2017; Christ & Burritt, 2017; Weber & Saunders-Hogberg, 2018; Holachi *et al*., 2023; Oghenemaro *et al*., 2023; Maity *et al*., 2025). Within this context, sustainability management requires firms to move beyond symbolic commitments and develop managerial policies that guide conservation-oriented decisions across organizational levels.

Managerial policies are the formal articulation of a firm's environmental priorities, but their effectiveness depends on coherence, implementation capacity, and alignment with operational routines. Policies that define targets, responsibilities, monitoring systems, and incentives can shape how managers allocate resources, evaluate trade-offs, and prioritize conservation initiatives (Carita *et al*., 2025). Studies of environmental strategy, environmental management accounting, and top management commitment suggest that managerial support and structured governance mechanisms are critical for translating sustainability intent into environmental practice (Dubey *et al*., 2017; Latan *et al*., 2018; Arda *et al*., 2019; Enwa *et al*., 2024; Nagdalian *et al*., 2024; Rakshitha *et al*., 2025). However, policy design often remains fragmented when strategic aspirations are not connected to measurable routines, accountability systems, and resource stewardship practices.

Existing sustainability research has frequently examined natural resource conservation, circular economy practices, environmental management systems, and water stewardship as related but distinct domains. Corporate water management studies emphasize disclosure, accounting, risk, and stewardship, while circular economy and resource efficiency studies often focus on closed-loop systems, material productivity, and supply chain practices (Geissdoerfer *et al*., 2017; Kirchherr *et al*., 2017; Ben-Amar & Chelli, 2018; Ortas *et al*., 2019; Saeed & Almendeel, 2023; Al-Kharabsheh *et al*., 2025; Zulkarnain *et al*., 2025). This separation limits understanding of how managerial policies could simultaneously influence material, energy, biodiversity, land-use, and water-related

outcomes. A more integrated framework is needed because firms rarely manage these resources in isolation; decisions about production, sourcing, process design, and investment often affect multiple resource systems at once.

This article proposes a conceptual framework examining how managerial policies influence natural resource conservation and water efficiency in business organizations. The framework distinguishes strategic policies, operational policies, and incentive policies, and links them to implementation pathways such as resource audits, process redesign, closed-loop systems, water monitoring, recycling, and stakeholder engagement. It also incorporates mediating factors, including leadership commitment, organizational culture, institutional pressure, and resource availability, which could strengthen or weaken policy effectiveness. By integrating sustainability management, corporate environmental strategy, water stewardship, and resource-based theoretical perspectives, the article clarifies how managerial policy design could support more systematic conservation outcomes.

## *Background*

### *Natural resource challenges and the business imperative*

Business organizations face growing pressure to conserve natural resources because their operations are embedded in material, energy, water, land, and ecosystem systems. Scarcity, regulatory expectations, stakeholder scrutiny, and supply-chain vulnerabilities make resource conservation a managerial issue rather than only an environmental compliance concern. Water-intensive and resource-dependent industries are especially exposed to operational and reputational risks when resource use is poorly governed or inadequately disclosed (Weber & Saunders-Hogberg, 2018; Zhou *et al*., 2018; Zeng *et al*., 2020; Erowati *et al*., 2024; Kuznetsova *et al*., 2024; Mashreghi *et al*., 2024; Dudarova *et al*., 2025). The business imperative for conservation therefore rests on aligning environmental responsibility with long-term resilience, operational continuity, and legitimacy.

### *Defining managerial policies in sustainability contexts*

In sustainability contexts, managerial policies can be understood as formal rules, commitments, targets, procedures, and accountability mechanisms that guide decision-making toward environmental objectives. Strategic policies establish corporate vision and priorities, operational policies translate those priorities into routines and standards, and incentive policies align managerial behavior with sustainability goals. Environmental strategy and environmental management accounting research suggests that policy effectiveness depends on the integration of strategic intent with measurement systems, organizational responsibilities, and managerial commitment (Latan *et al*., 2018; Gunarathne *et al*., 2021; Carpio-Vargas *et al*., 2023; Mustarichie & Saptarini, 2023; Nguyen *et al*., 2023; Kajanova & Danihel, 2025). This definition positions policy not as a static document but as an organizing mechanism that connects corporate sustainability goals to daily resource-use decisions.

### *Natural resource conservation and water efficiency metrics*

Natural resource conservation and water efficiency require metrics that capture both resource inputs and environmental consequences. Firms may assess material intensity, energy use, recycling rates, waste generation, land-use impacts, biodiversity-related sourcing practices, water withdrawal, consumption, discharge quality, and reuse practices. Water accounting research highlights the importance of monetary and non-monetary information for making water-related decisions visible to managers and comparable across organizational units (Burritt & Christ, 2017; Christ & Burritt, 2017; Thuy *et al*., 2023; Jegede, 2024; Pham, 2024). Because conservation outcomes are multidimensional, the framework treats metrics as decision-support tools that should be linked to policy objectives rather than as isolated reporting indicators (Torres-Cruz *et al*., 2025).

### *Theoretical foundations*

The natural-resource-based view explains how pollution prevention, product stewardship, and sustainable development capabilities can become strategic resources when embedded in organizational routines. Institutional theory helps explain why firms adopt environmental policies in response to regulatory, normative, and stakeholder pressures, while stakeholder theory clarifies how communities, investors, customers, and supply-chain partners influence resource stewardship expectations. Research on green innovation, environmental capabilities, and resource-based environmental strategy supports the idea that conservation-oriented policies can build capabilities that are valuable, organization-specific, and difficult to imitate (Mishra & Yadav, 2021; Khanra *et al*., 2022; Makhloufi *et al*., 2022; Alwabel & Ahmed, 2025; Çora *et al*., 2025; Nguyen *et al*., 2025). These theories jointly suggest that managerial policies matter because they structure both internal capability development and external legitimacy.

### *Prior research gaps*

Prior research provides important insights into water disclosure, environmental management systems, circular economy, green human resource management, and institutional pressures, yet it rarely integrates these areas into a policy-centered framework. Water stewardship studies often focus on reporting, risk, and accounting, while circular economy studies emphasize design, production, and supply-chain transformation (Govindan & Hasanagic, 2018; Merli *et al*., 2018; Zhang *et al*., 2021; Fu & Jacobs, 2022; Petronis *et al*., 2023a; Petronis *et al*., 2023b). Similarly, research on green human resource management and environmental commitment highlights organizational enablers but does not always specify how policy typologies connect to resource and water outcomes (Masri & Jaaron, 2017; Yong *et al*., 2020; Alrabiah *et al*., 2024; Varoneckaitė *et al*., 2024; Alwabel, 2025; Babu & Rajasekar, 2025). This fragmentation creates a need for a unifying conceptual model that links policy characteristics to conservation practices, water efficiency mechanisms, and contextual mediators.

## *Framework overview*

### *High-level architecture*

The proposed framework positions managerial policies as upstream drivers that influence organizational capabilities, managerial behavior, and operational practice. Strategic

policies define conservation intent, operational policies specify procedures and controls, and incentive policies shape accountability and motivation, while feedback loops allow managers to adjust policies in response to implementation learning. This architecture reflects evidence that environmental performance is shaped by top management support, environmental strategy, management accounting, and organizational culture (Dubey *et al*., 2017; Latan *et al*., 2018; Gunarathne *et al*., 2021; Enwa *et al*., 2023; Sergun *et al*., 2023; Tedeeva *et al*., 2023; Benhmida & Trabelsi, 2024). In conceptual terms, policies are expected to influence resource conservation and water efficiency indirectly by shaping capabilities, routines, investments, and cross-functional coordination.

*Core policy-outcome linkages*

The framework links different policy types to specific conservation behaviors and water stewardship practices. Strategic commitment could encourage material substitution, circular design, and long-term water-risk planning, while operational controls could guide process redesign, monitoring, leak detection, resource audits, recycling, and reuse systems. Incentive alignment could encourage managers to integrate conservation objectives into procurement, production, maintenance, and investment decisions rather than treating environmental concerns as peripheral obligations. Studies on water efficiency, environmental management practices, and circular economy implementation support the conceptual expectation that coherent managerial policies can enable more systematic resource-use improvements (Kirchherr *et al*., 2017; Govindan & Hasanagic, 2018; Jain *et al*., 2020; Fu & Jacobs, 2022; Liu *et al*., 2024; Chandrasekhar *et al*., 2025; Dulla *et al*., 2025).

*Design principles*

The framework is multi-level, dynamic, theory-grounded, and managerially actionable. Its multi-level structure connects policy design to practice implementation and performance assessment, while its dynamic orientation recognizes that policies should evolve through monitoring, learning, and stakeholder feedback. Its theoretical grounding draws from resource-based, institutional, and stakeholder perspectives, and its managerial orientation emphasizes practical diagnosis of policy gaps and implementation barriers (Wang *et al*., 2018; Potrich *et al*., 2019; Mishra & Yadav, 2021; García & Jaramillo, 2023; Kibizov *et al*., 2026). These design principles help avoid a narrow compliance view by treating conservation policy as a strategic system for coordinating resource stewardship across the firm.

**Figure 1** presents the proposed conceptual framework linking managerial policy types to implementation mechanisms, contextual mediators, and natural resource conservation and water efficiency outcomes in business organizations.

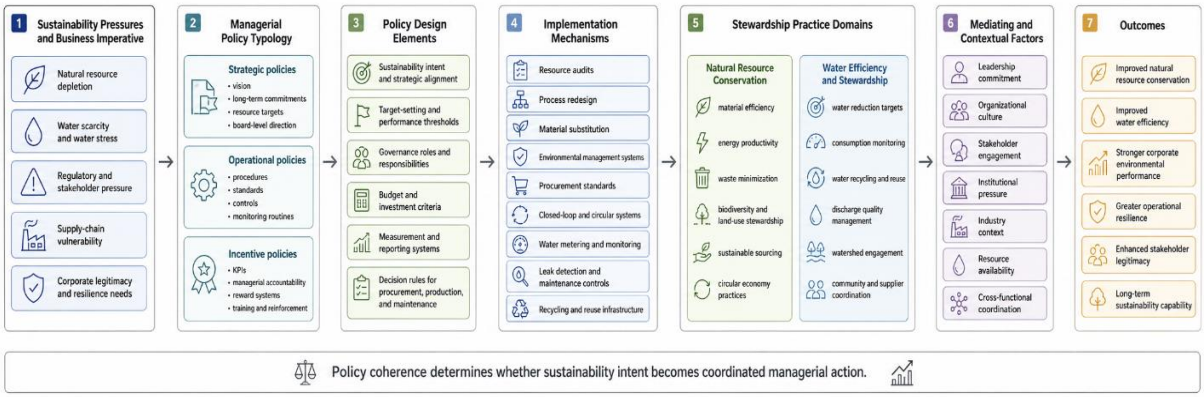


**Figure 1.** Managerial Policy Pathways Linking Sustainability Management to Natural Resource Conservation and Water Efficiency in Business Organizations

*Managerial policies as drivers*

*Strategic policies and resource conservation vision*

Strategic policies provide the overarching direction for natural resource conservation by embedding sustainability priorities into mission statements, corporate charters, board-level commitments, and long-term resource targets. Such policies can signal that material efficiency, energy productivity, biodiversity protection, and water stewardship are core managerial responsibilities rather than discretionary environmental initiatives. Research on corporate water management, environmental strategy, and proactive environmental management indicates that high-level commitments become more meaningful when connected to governance structures, information systems, and managerial decision processes (Weber & Saunders-Hogberg, 2018; Ortas *et al*., 2019; Potrich *et al*., 2019; Pisano *et al*., 2023; Poornachitra & Maheswari, 2023). Strategic policies therefore function as framing devices that define conservation ambition and authorize investment in capabilities needed to pursue it.

*Operational policies and process controls*

Operational policies translate strategic sustainability commitments into procedures, standards, monitoring routines, and process-level controls. These may include environmental management systems, water management plans, resource audits, procurement standards, production protocols, and maintenance procedures that guide day-to-day decisions. Studies of environmental management practices and integrated quality-environmental systems suggest that operational controls can improve the consistency with which sustainability objectives are embedded in production and managerial routines

(Wang *et al*., 2018; Arda *et al*., 2019; Prada *et al*., 2024; Delia *et al*., 2025). In the proposed framework, operational policies act as the bridge between corporate environmental intent and the practical implementation of conservation and water efficiency measures.

*Incentive policies and managerial accountability*

Incentive policies shape whether managers treat conservation and water efficiency as central responsibilities or secondary concerns. Performance appraisals, reward systems, resource efficiency key performance indicators, and internal accountability mechanisms can encourage managers to integrate environmental objectives into planning, budgeting, procurement, and operations. Research on top management commitment, green human resource management, and environmental management accounting indicates that managerial behavior is more likely to align with sustainability goals when incentives, training, and information systems reinforce environmental priorities (Masri & Jaaron, 2017; Latan *et al*., 2018; Yong *et al*., 2020; Basaad *et al*., 2026). Within the framework, incentive policies provide the motivational infrastructure that supports implementation of strategic and operational policy commitments.

**Table 1** consolidates the core managerial policy categories, their implementation mechanisms, and their decision-use metrics for natural resource conservation and water efficiency.

**Table 1.** Integrated Typology of Managerial Sustainability Policies and Their Resource-Stewardship Mechanisms

| Policy category | Core design elements | Primary managerial function | Main implementation mechanisms activated | Principal conservation and water domains influenced | Example decision-use metrics |
|---|---|---|---|---|---|
| **Strategic policies** | Mission-level sustainability commitments; long-term conservation targets; board oversight; capital allocation principles; supplier expectations | Define organizational direction and authorize sustainability as a strategic priority | Cross-functional coordination; investment prioritization; long-range planning; legitimacy building | Material conservation; energy productivity; biodiversity and land-use stewardship; long-term water-risk planning | Presence of formal conservation targets; board review frequency; proportion of strategic plans containing resource and water objectives; sustainability-linked capital screening |
| **Operational policies** | Environmental procedures; resource-use standards; procurement rules; water management plans; maintenance routines; monitoring protocols | Translate sustainability intent into day-to-day routines and process controls | Resource audits; process redesign; metering; leak detection; waste segregation; recycling and reuse systems; supplier compliance controls | Production efficiency; waste minimization; water withdrawal and consumption control; discharge management; sustainable sourcing | Audit completion rate; metering coverage; recycling rate; water reuse ratio; process loss rate; supplier compliance rate |
| **Incentive policies** | Managerial KPIs; performance appraisals; departmental scorecards; training expectations; reward and accountability mechanisms | Align managerial behavior with sustainability goals and reduce implementation drift | Budget discipline; target ownership; performance monitoring; behavioral reinforcement; cross-unit accountability | Consistent attention to resource conservation and water stewardship across departments | Percentage of managers with sustainability KPIs; target achievement rate; sustainability training completion; variance between unit targets and actual performance |
| **Integrated policy portfolio** | Deliberate alignment of strategic, operational, and incentive policies into one coherent policy bundle | Reduce fragmentation and create policy coherence across organizational levels | Reinforced decision-making; stronger implementation consistency; broader stewardship integration; cumulative capability development | Simultaneous gains across material, energy, biodiversity, circularity, and water domains | Composite policy coherence index; frequency of cross-functional sustainability review; number of domains with aligned targets; multi-domain environmental performance improvement |

*Natural resource conservation implementation*

*Material and energy efficiency initiatives*

Managerial policies can support material and energy efficiency by requiring resource audits, material substitution assessments, recycling systems, waste-to-resource programs, and process redesign. These initiatives are conceptually linked to resource productivity because they encourage managers to reduce avoidable inputs, extend material value, and reconsider production processes from a conservation perspective. Circular economy research shows that closed-loop thinking, eco-innovation, and supply-chain coordination are central to reducing resource dependence and waste generation (Geissdoerfer *et al*., 2017; Kirchherr *et al*., 2017; De Jesus & Mendonça, 2018). In this framework, material and energy efficiency initiatives represent the operational expression of managerial policies that seek to conserve resources while maintaining organizational functionality.

*Biodiversity and land use conservation*

Natural resource conservation also includes biodiversity protection, land-use stewardship, habitat preservation, and sustainable sourcing policies. Business organizations can influence land and biodiversity outcomes through procurement standards, supplier codes, deforestation policies, traceability systems, and ecosystem-sensitive investment criteria. Although corporate environmental management literature often emphasizes emissions, materials, and water, broader resource

stewardship requires firms to consider how sourcing and production decisions affect ecological systems beyond the factory boundary (Murray *et al*., 2017; Potrich *et al*., 2019; Mishra & Yadav, 2021). The framework therefore treats biodiversity and land-use conservation as important policy domains that extend managerial responsibility across supply chains and operating regions.

*Circular economy and closed-loop systems*

Circular economy and closed-loop systems provide a practical pathway for implementing natural resource conservation policies. Managerial policies can enable product-as-a-service models, remanufacturing, repair, reuse, recycling, extended producer responsibility, and closed-loop supply chains by clarifying responsibilities, investment priorities, and performance expectations. Circular economy scholarship emphasizes that implementation depends not only on technical feasibility but also on managerial coordination, organizational capabilities, supply-chain alignment, and supportive policy structures (Heshmati, 2017; Govindan & Hasanagic, 2018; Korhonen *et al*., 2018; Merli *et al*., 2018). In the proposed framework, circular economy practices are positioned as implementation mechanisms through which strategic and operational policies could reduce dependence on virgin resources and support long-term conservation.

*Water efficiency and stewardship*

*Water reduction targets and consumption monitoring*

Water reduction targets and consumption monitoring are central managerial policy tools for improving water efficiency because they make water use visible, comparable, and actionable across organizational units. Policies mandating water audits, baseline measurement, metering, and target-setting could help managers identify inefficient processes, prioritize conservation investments, and evaluate whether operational practices are aligned with corporate stewardship goals. Corporate water accounting research emphasizes that water information should support internal decision-making rather than merely external reporting, because managers need reliable data to assess risk, cost, and conservation opportunities (Burritt & Christ, 2017; Christ & Burritt, 2017). Within the proposed framework, monitoring policies are expected to strengthen the link between strategic water commitments and operational practices such as leak detection, process optimization, and disciplined consumption review (Zhang & Tang, 2019; Fu & Jacobs, 2022).

*Water recycling and reuse technologies*

Managerial commitment to water recycling and reuse technologies can shape whether firms treat water efficiency as a routine operational objective or as an occasional compliance response. Policies that authorize investment in on-site treatment, rainwater harvesting, cascading water use, closed-loop process water systems, and reuse infrastructure could enable firms to reduce dependence on external water withdrawals while improving resilience in water-stressed contexts. Studies of corporate water management and water-oriented business cases suggest that implementation depends on the perceived strategic value of water initiatives, the availability of internal decision-support information, and the willingness of managers to allocate capital to stewardship practices (Pedersen *et al*., 2017; Weber & Saunders-Hogberg, 2018). In this framework, recycling and reuse technologies are not treated as purely technical solutions but as outcomes of policy choices that define priorities, responsibilities, and investment criteria.

*Watershed and community engagement*

Water stewardship extends beyond internal efficiency because business organizations often share water resources with communities, ecosystems, suppliers, and public institutions. Managerial policies can promote watershed engagement by requiring site-level water-risk assessment, stakeholder dialogue, transparent disclosure, supplier coordination, and participation in collective action initiatives. Research on water disclosure and stakeholder influence indicates that external expectations can shape how firms communicate, manage, and justify water-related decisions, particularly in sectors exposed to public scrutiny or high water dependency (Ben-Amar & Chelli, 2018; Zhang *et al*., 2021; Wicaksono & Setiawan, 2022). The framework therefore positions watershed and community engagement as an outward-facing policy pathway through which firms could connect internal water efficiency with broader shared-resource governance.

*Mediating mechanisms and contextual factors*

*Organizational culture and leadership commitment*

Organizational culture and leadership commitment mediate the effectiveness of managerial policies by influencing whether employees and managers interpret conservation goals as meaningful, legitimate, and actionable. A conservation-oriented culture can support cross-functional cooperation, encourage resource-saving behavior, and reduce resistance to procedural changes associated with audits, monitoring, recycling, and circular economy practices. Research on top management commitment, environmental training, and organizational culture suggests that policy implementation is stronger when leaders visibly support environmental objectives and provide the resources, knowledge, and incentives needed for action (Dubey *et al*., 2017; Latan *et al*., 2018; Liu *et al*., 2020). In the framework, leadership and culture are therefore conceptualized as enabling conditions that help transform formal policies into sustained managerial routines.

*External pressures and industry context*

External pressures and industry context can moderate how managerial policies influence natural resource conservation and water efficiency. Regulatory stringency, investor expectations, customer demands, water stress, sectoral norms, supply-chain scrutiny, and community concerns can all affect whether firms adopt ambitious policies or rely on minimal compliance. Institutional research suggests that environmental practices are shaped by coercive, normative, and mimetic pressures, while water-risk studies indicate that sector and location can influence the salience of water management in corporate decision-making (Wang *et al*., 2018; Zhou *et al*., 2018; Ortas *et al*., 2019; Zeng *et al*., 2020). The framework therefore assumes that the same policy design may produce different

implementation pathways depending on industry characteristics, resource dependency, and institutional context.

*Managerial decision-support and policy design*

*Policy diagnostic and gap analysis*

The framework can serve as a diagnostic tool for assessing whether a firm's existing sustainability policies adequately cover natural resource conservation and water efficiency. Managers could use the model to examine whether strategic commitments are linked to operational controls, whether resource metrics are available for decision-making, whether water stewardship is integrated with broader conservation priorities, and whether incentives reinforce or undermine stated objectives. Research on environmental management accounting, water accounting, and proactive environmental management supports the view that decision-support systems are necessary for identifying gaps between policy intent and managerial practice (Burritt & Christ, 2017; Christ & Burritt, 2017; Latan *et al*., 2018; Potrich *et al*., 2019). A diagnostic application of the framework would therefore help firms identify missing policy elements, weak accountability structures, and areas where conservation practices require clearer managerial authorization.

*Designing integrated policy portfolios*

Integrated policy portfolios combine strategic, operational, and incentive policies so that conservation objectives are reinforced across multiple levels of the organization. A firm may articulate a strategic conservation vision, translate it into operational standards for procurement and production, and align managerial evaluation with resource efficiency and water stewardship responsibilities. Research on environmental management systems, circular economy implementation, green human resource management, and sustainable supply chain innovation suggests that environmental outcomes depend on coordinated bundles of practices rather than isolated interventions (Arda *et al*., 2019; Jain *et al*., 2020; Yong *et al*., 2020; Nilsson & Göransson, 2021). In the proposed framework, integrated policy portfolios are expected to reduce policy conflict, improve coherence, and support synergies between material efficiency, energy conservation, biodiversity protection, circular systems, and water stewardship.

**Figure 2** presents a diagnostic architecture showing how integrated policy portfolios can be assessed, aligned, and evaluated for resource stewardship performance.

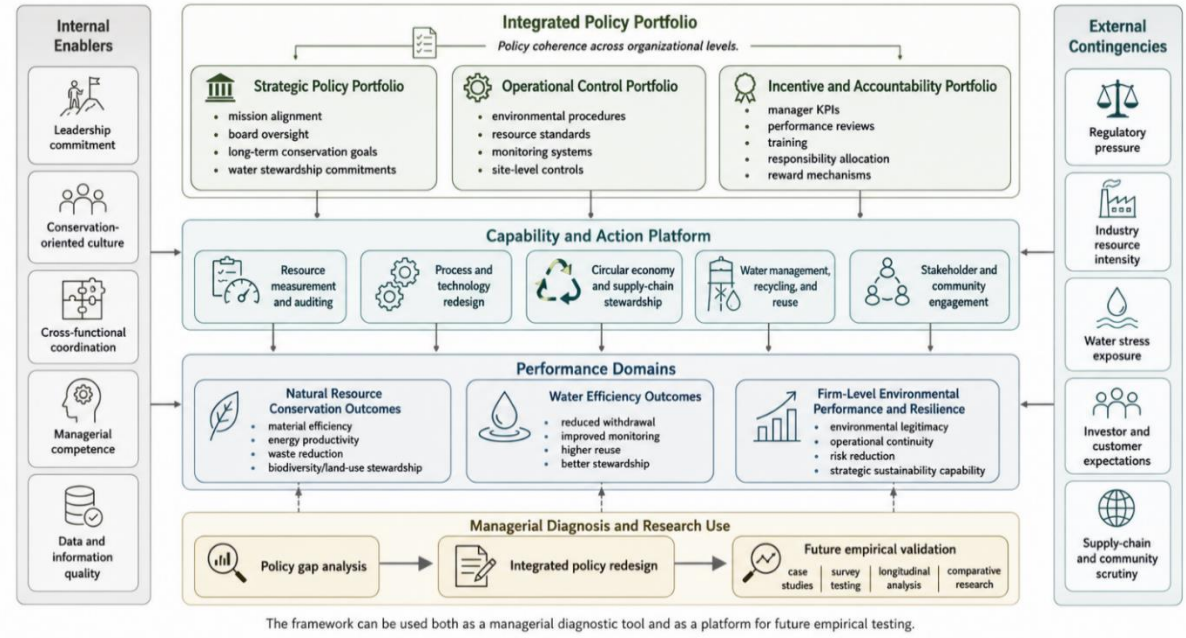


**Figure 2.** Diagnostic Architecture for Integrated Sustainability Policy Portfolios and Resource Stewardship Evaluation

*Evaluation strategy for the framework*

*Qualitative testing through case studies*

The framework could be evaluated through qualitative case studies in water-intensive and resource-dependent industries, where managerial policies can be traced from strategic design to operational implementation. Case studies would allow researchers to examine how policy documents, managerial interviews, site practices, supplier relationships, and stakeholder engagement processes reveal the pathways connecting policies to conservation and water efficiency actions. Prior research on business cases for water management, corporate water practices, and proactive environmental management illustrates the value of examining organizational context and managerial interpretation when evaluating sustainability initiatives (Pedersen *et al*., 2017; Weber & Saunders-Hogberg, 2018; Potrich *et al*., 2019). Such qualitative testing would be especially useful for identifying policy mechanisms, implementation barriers, and feedback loops that may be difficult to capture through standardized survey instruments alone.

*Quantitative empirical validation*

Quantitative empirical validation could involve developing survey scales that measure policy comprehensiveness, strategic commitment, operational control, incentive alignment, water monitoring, resource conservation practices, and perceived implementation effectiveness. Researchers could then examine conceptual relationships between policy dimensions and indicators such as material productivity, energy efficiency, recycling practices, water withdrawal monitoring, reuse systems, and disclosure quality, while avoiding unsupported causal claims until stronger designs are available. Studies on environmental management practices, water efficiency, water disclosure, and green innovation provide foundations for constructing measures that connect managerial policy design with environmental management outcomes (Fu & Jacobs, 2022; Khanra *et al*., 2022; Wicaksono & Setiawan, 2022; Rosa *et al*., 2023). In this framework, quantitative validation should be treated as a future research strategy for assessing theoretical propositions rather than as evidence of predetermined policy effects.

*Longitudinal and comparative research needs*

Longitudinal and comparative research would help clarify how managerial policies evolve over time and across institutional settings. Because conservation policies may be introduced, revised, weakened, or strengthened in response to regulation, stakeholder pressure, resource scarcity, and organizational learning, researchers should examine policy trajectories rather than only cross-sectional snapshots. Multi-country and institutionally comparative studies of corporate water management and disclosure suggest that national governance conditions, sectoral expectations, and institutional environments can influence how firms design and communicate water and resource policies (Ben-Amar & Chelli, 2018; Ortas *et al*., 2019; Zhang *et al*., 2021). The framework therefore encourages future research that compares firms across regions, industries, and time periods to understand how contextual variation shapes policy-practice linkages.

**Table 2** converts the conceptual framework into testable propositions, candidate indicators, and empirical designs for future validation.

**Table 2.** Testable Propositions and Empirical Validation Pathways for the Managerial Policy–Stewardship Framework

| Proposition ID | Conceptual proposition | Theoretical rationale | Key mediators or moderators | Illustrative indicators | Recommended empirical approach |
|---|---|---|---|---|---|
| **P1** | Greater **strategic policy comprehensiveness** is associated with stronger organizational commitment to natural resource conservation and water stewardship. | Strategic direction-setting shapes legitimacy, resource prioritization, and managerial attention. | Leadership commitment; board support; stakeholder pressure | Formal conservation targets; board oversight structures; strategic sustainability integration score | Multi-respondent survey; comparative case studies |
| **P2** | Stronger **operational policy specificity** is associated with more consistent implementation of conservation and water-efficiency practices. | Clear procedures and controls improve routinization and reduce ambiguity. | Data quality; process complexity; plant-level capacity | Presence of audits, metering, process standards, leak detection systems, procurement controls | Facility-level survey; case comparison; document analysis |
| **P3** | Higher **incentive-policy alignment** is associated with stronger managerial accountability for sustainability outcomes. | Incentives and accountability systems influence managerial behavior and sustained follow-through. | Training quality; managerial discretion; cross-functional coordination | Sustainability-linked KPIs; appraisal criteria; reward structures; departmental target ownership | Survey-based structural modeling; interview validation |
| **P4** | Firms with a more **integrated policy portfolio** will show better combined performance across natural resource conservation and water efficiency than firms relying on isolated policies. | Bundled practices generate synergy and reduce fragmentation. | Policy coherence; organizational culture; resource availability | Composite policy coherence score; simultaneous gains in recycling, energy efficiency, and water reuse | Cross-sectional survey; matched comparative design |
| **P5** | **Leadership commitment** and a **conservation-oriented organizational culture** positively mediate the relationship between managerial policies and implementation effectiveness. | Formal policy is more likely to become routine practice when supported by leadership and culture. | Employee engagement; internal communication quality | Leadership visibility; culture scales; cross-functional participation; implementation consistency | Mediation testing in surveys; embedded case studies |

| | | | | | |
|---|---|---|---|---|---|
| **P6** | **Institutional pressure**, **industry context**, and **water-stress exposure** moderate the strength of the relationship between managerial policies and stewardship outcomes. | External context changes the salience, urgency, and feasibility of policy implementation. | Regulation; sector resource intensity; community scrutiny | Regulatory stringency; industry type; local water-risk exposure; stakeholder activism | Comparative multi-industry and multi-region analysis |
| **P7** | Availability of high-quality **decision-support metrics** strengthens the translation of policy commitments into measurable environmental performance. | What gets measured is more likely to be managed and improved. | Measurement maturity; information systems capability | Metering coverage; frequency of resource reporting; quality of internal dashboards; KPI completeness | Survey plus archival indicator analysis |
| **P8** | Stronger **watershed and stakeholder engagement policies** are associated with broader stewardship outcomes beyond internal efficiency alone. | External engagement expands sustainability from internal control to shared-resource governance. | Community relations; supply-chain dependence; disclosure transparency | Supplier stewardship programs; collective water initiatives; disclosure quality; community engagement frequency | Qualitative case studies; mixed-method comparative research |

*Limitations*

*Conceptual and measurement limitations*

The framework is conceptual and therefore does not claim empirical confirmation of causal relationships between managerial policies and conservation outcomes. Natural resource conservation and water efficiency are multifaceted constructs, and measurement can be complicated by inconsistent data boundaries, differences between absolute and intensity-based indicators, variation in disclosure quality, and difficulty comparing facilities or sectors. Water accounting and disclosure research shows that the usefulness of water information depends on how firms define, collect, and apply it in internal and external decision processes (Burritt & Christ, 2017; Christ & Burritt, 2017; Zhang & Tang, 2019). Consequently, the framework should be interpreted as a structured guide for theory development, policy diagnosis, and future empirical testing rather than as a validated performance model.

*Context and generalizability*

The framework may require adaptation for small and medium-sized enterprises, service firms, resource-intensive manufacturers, agricultural supply chains, and organizations operating in regions with different water stress or regulatory conditions. Large firms may have more formal governance systems, reporting capacity, and investment resources, while smaller firms may rely on informal managerial practices and face constraints in implementing advanced monitoring or recycling technologies. Research on circular economy barriers, institutional pressures, and environmental capabilities suggests that organizational resources, sectoral conditions, and external expectations strongly influence the feasibility of sustainability practices (De Jesus & Mendonça, 2018; Govindan & Hasanagic, 2018; Wang *et al*., 2018; Gunarathne *et al*., 2021). The framework is therefore intended as a flexible conceptual architecture whose policy categories can be adapted to different organizational and geographic contexts.

## CONCLUSION

This article has developed a conceptual framework linking managerial policies to natural resource conservation and water efficiency in business organizations. The framework argues that strategic policies, operational policies, and incentive policies can shape the organizational capabilities, routines, and accountability mechanisms through which conservation and stewardship practices are implemented. By integrating resource conservation and water efficiency into one model, the framework provides a structured way to examine how managerial action could support more coherent sustainability management.

A key strength of the framework is its explicit policy typology, which distinguishes direction-setting policies from process-control policies and accountability-oriented policies. This typology helps clarify why sustainability commitments may fail when they are not supported by operational routines or incentive systems. The framework also contributes a practical decision-support orientation by showing how managers can assess policy coverage, implementation pathways, and contextual mediators.

Important challenges remain for future research and practice. The framework requires empirical validation through qualitative case studies, survey research, longitudinal analysis, and comparative studies across sectors and institutional contexts. Data limitations, inconsistent performance metrics, and differences in organizational capacity may complicate efforts to evaluate policy effectiveness in a consistent manner.

Firms can use the framework as a policy design tool for embedding conservation and water efficiency into strategic planning, operational management, and managerial accountability. Researchers can use it to develop testable propositions about how policy design influences environmental practices under different organizational and institutional conditions. A stronger understanding of these policy pathways would support more integrated, evidence-informed approaches to corporate sustainability management.

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