

Volume 24 (2026), pp. 177-198  
*American Journal of STEM Education:  
Issues and Perspectives*  
Star Scholars Press  
<https://doi.org/10.32674/mk8rpb95>

## **From Vision to Action and Evaluation: Role of Governance and Stakeholder Engagement in Nurturing Green Schools in India**

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### **ABSTRACT**

*The concept of a 'green school' integrates education for sustainable development into all aspects of school life, involving the entire school community. The researcher analyzed 19 global resources on green schools using framework analysis to identify the best strategies for governance and stakeholder engagement in energy, food, water, waste, and biodiversity. A thematic framework was developed, and tools were created for data collection from state-run residential schools in the Delhi NCR, India. The results present governance strategies, including vision, mission, objectives, and values, that guide green practices. It also includes action plans that delineate roles, set goals, audit performance, engage the community, and report achievements. Monitoring and evaluation strategies use quantitative and qualitative data to assess progress, fostering comprehensive change.*

**Keywords:** Education for sustainable development, Green schools, Stakeholder engagement

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### **INTRODUCTION**

Contemporary educational systems face an urgent imperative to prepare students for an increasingly complex world characterized by climate change, resource depletion, and environmental degradation (Kensler & Uline, 2017). This study examines how effective governance structures and strategic stakeholder

engagement can nurture green schools in India, with the overarching purpose of identifying best practices that integrate education for sustainable development (ESD) into all aspects of school operations. The research specifically aims to: (1) analyze global strategies for green school governance across five key domains—energy, food, water, waste, and biodiversity; (2) develop a comprehensive framework for stakeholder engagement in Indian residential schools; and (3) create practical tools and evaluation mechanisms that support the transformation of traditional schools into sustainable learning environments. The significance of this research lies in its potential to inform policy development, provide actionable guidance for school administrators, and contribute to India's broader sustainability goals by fostering environmental stewardship among the next generation of citizens.

Methodologically, this study employed a mixed-methods approach combining framework analysis of 19 global resources on green schools with primary data collection from five Jawahar Navodaya Vidyalayas in the Delhi NCR region. The investigation focuses on governance structures that encompass vision development, action planning, team formation, and monitoring and evaluation systems. This introduction proceeds to examine the global context of education for sustainable development, explore the concept and implementation of green schools, establish the theoretical foundations for governance and stakeholder engagement, and situate the Indian context within international best practices.

The global educational landscape increasingly recognizes that traditional industrial-era schooling models inadequately prepare students for 21st-century sustainability challenges (Kensler & Uline, 2017). The interconnectedness of local and global environmental issues demands educational responses that transcend conventional subject boundaries and integrate sustainability principles into institutional culture. UNESCO's Education for Sustainable Development agenda, launched in 1992 and reinforced through the Decade of Education for Sustainable Development (2005-2014) and subsequent Global Action Programme, has established a framework for transformative education that addresses environmental, social, and economic dimensions of sustainability (UNESCO, 2014; UNESCO, 2016).

Green schools represent a comprehensive approach to implementing ESD by creating learning environments where sustainability principles permeate governance structures, teaching methodologies, community partnerships, and facility operations. The concept extends beyond environmental education to encompass what UNESCO describes as a "whole-school approach" that transforms institutional culture and practices (UNESCO, 2014). This transformation requires sustained leadership, systematic planning, inclusive stakeholder engagement, and robust evaluation mechanisms—elements that constitute the core governance framework examined in this study.

The vision of green schools aligns with UNESCO's definition of ESD, which aims to empower learners "to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity" (UNESCO, 2014, p. 12; UNESCO, 2016a, p. 9). Achieving this vision requires educational approaches that engage students' cognitive, affective, and behavioral domains through participatory, democratic, and learner-centered pedagogies (WWF, 2012). The governance structures that support these approaches must facilitate coordination among diverse stakeholders while maintaining focus on measurable sustainability outcomes.

This research addresses a critical gap in understanding how governance mechanisms can effectively coordinate the complex stakeholder relationships necessary for successful green school implementation. While existing literature extensively documents individual green practices and isolated case studies, limited research examines the systematic governance approaches that enable sustained transformation across multiple stakeholder groups. The study's focus on Indian residential schools provides particularly valuable insights, as these institutions serve diverse populations and operate with relatively autonomous governance structures that can implement comprehensive sustainability initiatives.

The practical significance of this research extends across multiple dimensions. For educational policymakers, the findings offer evidence-based frameworks for developing national and regional policies that promote sustainable practices within educational institutions, supporting India's commitments to global sustainability goals. For school administrators and educators, the research provides actionable strategies for vision development, stakeholder engagement, and performance evaluation that can guide institutional transformation. For students and communities, effective green school governance creates opportunities for meaningful participation in sustainability initiatives that develop critical thinking, problem-solving, and civic engagement skills essential for addressing environmental challenges.

The environmental benefits of systematic green school implementation are substantial and measurable. Schools adopting comprehensive sustainability practices can significantly reduce carbon footprints, conserve water resources, manage waste effectively, and preserve local biodiversity (Sekulava & Mallen, 2024). These institutional changes contribute to broader environmental conservation efforts while providing authentic learning laboratories where students experience the practical application of sustainability principles. The governance frameworks identified in this study enable schools to systematically plan, implement, and evaluate these environmental initiatives while engaging multiple stakeholders in collaborative action.

Community engagement emerges as a particularly critical dimension of green school governance, as successful sustainability initiatives require active

participation from students, teachers, administrators, support staff, parents, and local community members. This collective engagement not only enhances the effectiveness of green practices but also strengthens community bonds and promotes civic responsibility that extends beyond school boundaries. The governance structures examined in this study provide mechanisms for coordinating these diverse stakeholder contributions while maintaining institutional focus and accountability.

The research methodology builds upon established framework analysis techniques to identify recurring themes and best practices across diverse international contexts, subsequently validated through primary data collection in Indian residential schools. This approach enables the development of culturally appropriate governance frameworks while drawing upon global expertise and innovation in green school implementation. The resulting frameworks and tools serve as practical resources for schools seeking to initiate or strengthen their sustainability efforts while providing foundations for future research in sustainable education.

In examining the role of governance and stakeholder engagement in nurturing green schools, this study contributes to the evolving understanding of how educational institutions can serve as catalysts for broader societal transformation toward sustainability. The frameworks and strategies identified through this research offer pathways for creating educational environments where sustainability becomes a lived experience for all participants, fostering the development of environmentally conscious citizens equipped to address the complex challenges of the 21st century. (John, 2025)

## **LITERATURE REVIEW**

The concept of green schools has gained significant attention in recent years as a critical component of education for sustainable development (ESD). Green schools aim to create a sustainable learning environment that integrates the principles of sustainability into the educational process, thereby fostering an ethos of environmental stewardship among students and staff. This review synthesizes prominent national and international research studies to highlight the practices and frameworks that support the development of green schools.

### **Frameworks and Theoretical Foundations**

Green schools operate on the principle that education must prepare students not only for academic success but also for responsible citizenship in a sustainable world. UNESCO has been at the forefront of promoting ESD, emphasizing the need for education systems to address global challenges such as

climate change, biodiversity loss, and sustainable resource management (UNESCO, 2014; UNESCO, 2016). The whole-school approach advocated by UNESCO and other organizations integrates sustainability into governance, teaching, learning, community partnerships, and facilities and operations, ensuring that sustainability becomes a lived experience for all school stakeholders (UNESCO, 2014; Kensler & Uline, 2017). Further, a recent study on green education (Drigas et al., 2025) also describes curriculum, pedagogy, and policy as critical elements for the green transition in schools. The author also emphasized systems thinking, ecological literacy, and the need for governance structures that support whole-institution change.

### **Global and National Initiatives**

Various countries have developed frameworks and resources to support the implementation of green schools. In Fiji, the "Green Schools Teachers' Manual: Education for Sustainable Environment" provides comprehensive guidelines for integrating environmental education into the curriculum (Green Schools Teachers' Manual, Fiji Islands). In Scotland, the "Schools Global Footprint: Teaching Resource for Schools" developed by WWF serves as a valuable tool for educators to promote sustainability practices (Schools Global Footprint, Scotland). In Canada, the "Eco-Schools Certification Toolkit" by the Toronto District School Board and the "Ontario Eco-Schools: Get Inspired-Book" outline practical steps for schools to achieve eco-certification and engage the entire school community in sustainability initiatives (Eco-Schools Certification Toolkit, Toronto; Ontario Eco-Schools). Similarly, Australia's "The Resource Smart Schools Sustainability Victoria—A Practical 'How To' Guide" offers a detailed roadmap for schools aiming to reduce their environmental impact (Resource Smart Schools, Victoria).

### **Research on Green School Practices**

Studies have shown that green schools not only improve environmental outcomes but also enhance educational quality and student well-being. For example, research by the National Council of Educational Research and Training (NCERT) in India highlights best practices in greening schools, emphasizing the importance of teacher training, student engagement, and community involvement (NCERT, India). The Centre for Science and Environment's report, "Paving the Path: A Selection of Best Environmental Practices in Schools across India," further corroborates these findings, showcasing successful case studies from various Indian schools (Centre for Science and Environment, India). In the United States, the "Florida Green School Guide" and the "Healthy Sustainable Schools Guide" from Minnesota provide detailed strategies for schools to adopt sustainable

practices, from energy conservation to waste management and water use (Florida Green School Guide; Healthy Sustainable Schools Guide, Minnesota). Additionally, Aeschbach et al., 2025 presents meta-analysis which spans cognitive, affective, and behavioral domains, finding that hands-on, project-based, and participatory interventions most effectively foster student engagement and sustainable behaviours. These studies underscore the importance of a systemic approach, where sustainability is embedded into the school's culture and operational practices.

## **Methodological Approaches in Green School Research**

Fernando & Tajan, 2025, systematically reviews international studies on participatory research as a method for advancing education for sustainable development (ESD). It highlights how PR empowers diverse stakeholders—students, teachers, community members—enabling context-sensitive, inclusive solutions to sustainability challenges in schools. The authors discuss research designs emphasizing collaboration and co-creation of knowledge, offering direct methodological guidance for green school initiatives and stakeholder engagement.

The methodologies employed in researching green schools often include both qualitative and quantitative approaches. Framework analysis is commonly used to identify and analyze practices across different schools and contexts. This method involves coding and categorizing data to develop thematic frameworks that guide the evaluation and implementation of sustainable practices. Quantitative assessments, such as surveys and questionnaires, are used to measure the effectiveness of these practices, whereas qualitative assessments, including interviews and focus groups, provide deeper insights into the experiences and perceptions of school stakeholders (WWF, 2018).

In conclusion, the body of research on green schools emphasizes the vital role of sustainable education frameworks and whole-school governance. By integrating sustainability into all aspects of school life, green schools not only contribute to environmental conservation but also prepare students to be proactive and informed citizens. The frameworks and best practices highlighted in this review provide valuable guidance for schools worldwide seeking to embark on the path of sustainability. Methodologically, the integration of qualitative insights with quantitative assessments, including systematic participatory research (Fernando & Tajan, 2025), strengthens understanding of contextual factors that influence sustainability outcomes. Overall, the literature calls for integrating strong governance mechanisms, inclusive stakeholder collaboration, and rigorous evaluation frameworks to realize the full potential of green schools as transformative educational environments poised to address pressing global sustainability challenges.

## RESEARCH METHOD

This exploratory study aimed to identify and analyze strategies for nurturing green schools through effective governance and stakeholder engagement. To achieve this goal, the study utilized both primary and secondary data, following a structured and systematic approach.

Initially, a comprehensive review of the literature on green school practices was conducted. Nineteen resources, including manuals, guidebooks, case studies, and reports from various global contexts, were identified and reviewed. These resources were selected on the basis of their comprehensiveness in covering the practices of green schools. The secondary data were analyzed using the principles of Framework Analysis, which helped in identifying thematic frameworks related to energy, food, water, waste, and biodiversity. These frameworks informed the development of tools for primary data collection.

The secondary data were analyzed using the principles of Framework Analysis (Ritchie & Spencer, 1994). The coding process involved multiple stages to ensure rigor and validity:

1. Initial Familiarization: All 19 resources were read thoroughly to gain comprehensive understanding of green school practices globally.
2. Thematic Coding: Data were systematically coded using both deductive and inductive approaches. Deductive codes were derived from established theoretical frameworks of Education for Sustainable Development (ESD), while inductive codes emerged from the data itself.
3. Framework Matrix Development: Codes were organized into a comprehensive framework matrix encompassing four primary governance dimensions: (a) Vision-Mission-Objectives-Values, (b) Action Plan and Execution, (c) Team Structure, and (d) Monitoring and Evaluation.
4. Expert Validation: The coding framework was reviewed by three subject matter experts in environmental education and validated through expert feedback to ensure content validity and theoretical soundness.

The primary data collection focused on five Jawahar Navodaya Vidyalayas in the Delhi NCR region, selected purposively on the basis of their involvement in WWF India's Ek Prithvi (One Earth) Conservation Leadership through Education programme. The criteria for selecting these schools included the extent of teacher training conducted, responsibilities assigned to teachers, time allocated for green activities in the school calendar, documentation work, and assessment results.

The study involved various stakeholders, including school principals, coordinators, teachers, and students. The data collection tools included interview schedules for principals and coordinators, questionnaires for teachers, focus group discussion questions for students, and observation checklists. These tools were

designed on the basis of the thematic frameworks identified from the secondary data analysis, encompassing parameters such as governance, teaching and learning, community partnerships, and facilities and operations. The data collection instruments underwent a comprehensive validation process to ensure methodological rigor. Content validity was established by aligning tool design with thematic frameworks from secondary data analysis. All instruments were reviewed by five experts in environmental education and research methodology for theoretical soundness and clarity. Tools were pilot-tested with stakeholders from one school (excluded from the final sample) to refine question clarity and identify potential issues. Finally, school coordinators reviewed the final versions to ensure appropriateness for the Indian educational context. This validation process enhanced the reliability and validity of data collection, ensuring effective capture of green school governance and stakeholder engagement dynamics.

The sample comprised five Jawahar Navodaya Vidyalayas:

1. Jawahar Navodaya Vidyalaya, Mothuka, Faridabad, Haryana
2. Jawahar Navodaya Vidyalaya, Mungeshpur, North Delhi
3. Jawahar Navodaya Vidyalaya, Mohamaddpur-Saidpur, Gurugram, Haryana
4. Jawahar Navodaya Vidyalaya, Jaffarpur Kalan, South West Delhi
5. Jawahar Navodaya Vidyalaya, Bai, Nuh, Mewat, Haryana

Additionally, twenty teachers responsible for WWF activities in grades 6 to 9 and twenty Grade 9 students participated in the study. Grade 9 students were selected for focus group discussions because of their prolonged engagement with green initiatives, providing more in-depth insights into the practices being adopted in the schools.

Primary data were analyzed through systematic thematic analysis following established qualitative research protocols. All interviews and focus group discussions were audio-recorded and transcribed verbatim to ensure accuracy and completeness. The coding process utilized the framework developed from secondary analysis while remaining open to emergent themes that arose from the primary data. To enhance credibility and provide comprehensive understanding, multiple data sources including interviews, questionnaires, and observations were triangulated. Additionally, member checking was conducted by sharing key findings with select participants to verify accuracy and validate interpretations, ensuring the reliability of the analytical outcomes. This combined analysis of primary and secondary data facilitated the development of comprehensive governance strategies for green schools, encompassing all aspects of school life, from vision creation to action planning and evaluation.

While this study provides valuable insights into green school governance and stakeholder engagement, several limitations must be acknowledged. The geographic scope was limited to five schools in the Delhi NCR region, potentially

restricting the generalizability of findings to other contexts within India and internationally. The focus on Jawahar Navodaya Vidyalayas (residential government schools) may limit applicability to private schools, day schools, or institutions in different socio-economic settings. The cross-sectional design captured practices at a specific point in time, potentially missing seasonal variations or long-term implementation trends. Additionally, while multiple stakeholder groups were included, parent and community perspectives were not directly captured, representing a gap in comprehensive stakeholder assessment. Language barriers arose as some data collection was conducted in Hindi/local languages and translated to English, potentially introducing interpretation variations. The reliance on self-reported data from schools actively participating in WWF programs may have introduced positive response bias regarding green practices implementation. Finally, resource constraints limited the depth of longitudinal analysis and follow-up assessments of sustainability outcomes.

Despite these limitations, the methodology employed, integrating qualitative data from diverse sources and employs a structured analytical framework, offers a robust approach for exploring the practices and strategies that can make schools greener through effective governance and stakeholder engagement. This methodology not only identifies potential strategies but also provides a foundation for future research in sustainable education.

## ANALYSIS

An increasing number of researchers are advocating the whole school approach to operationalize ESD in schools, which hopes to reflect the microcosm of the sustainable society we wish to create. As the name says, the whole-school approach implies that every aspect of the school culture works toward the goals of sustainability through its concerted efforts in – governance, teaching and learning, community partnerships, and facilities and operations – and is habituated in the daily actions of managers, administrators, teachers, students, school helpers, and even parents. The underlining principle of the whole school approach follows Mahatma Gandhi’s quote, “be the change you wish to see in the world.” The approach helps in changing the culture of the school by practicing what is being taught in the school; thus, students learn what is right and what is wrong by unknowingly imbibing appropriate knowledge, attitudes, values, and skills.

To identify the essential attributes of each of the governance elements of the whole school approach, secondary data comprising the nineteen resources were coded, and the recurrent codes are analyzed.

The analysis of this study focuses on the essential attributes related to governance that contribute to the effective greening of schools. These attributes include Vision/Mission/Objectives/Values, Action Plan and Execution, Team Structure, and Monitoring and Evaluation.

## **Vision/Mission/Objectives/Values**

Governance in green schools begins with a clear vision, mission, objectives, and values that guide the teaching-learning process and day-to-day operations. These components set the foundation for the school's commitment to sustainability and environmental stewardship. The vision and mission statements reflect the school's overarching goals and principles, whereas the objectives provide specific targets to be achieved. The values, often encapsulated in mottos or prayers, promote a culture of respect and responsibility toward the environment.

## **Action plan and execution**

Greening schools requires a well-structured action plan, which is crucial for organizing and executing green practices. This action plan includes several steps: auditing current practices, identifying opportunities for improvement, setting and prioritizing goals, engaging and educating the community, and, finally, reporting and communicating achievements (Benner & Waslander, 2015). Audits and self-assessments help in understanding the existing state of environmental practices within schools. Conservation and awareness measures, along with specific action plans, enable schools to address areas of improvement systematically. Celebrating specific environmental days and effectively communicating achievements help maintain enthusiasm and commitment among stakeholders.

## **Team structure**

A successful green school initiative involves a comprehensive team structure that includes all stakeholders—students, teachers, maintenance and support staff, and school administration. This inclusive approach ensures that everyone is empowered to lead meaningful and productive lives, acting responsibly toward the environment. By training and engaging every stakeholder, the school fosters a sense of collective responsibility and participation in sustainability efforts, transforming the stakeholders in both their professional and personal lives. (Rundgren & Yamada, 2023)

## **Monitoring and evaluation**

Continuous monitoring and evaluation are critical for tracking the progress of green initiatives and ensuring that the school is developing into a model green school. This involves both quantitative and qualitative assessments to provide a comprehensive evaluation mechanism (WWF, 2018). Quantitative data can include metrics such as energy audits, biodiversity counts, transportation surveys,

and attendance records, whereas qualitative data may include samples of student work, lesson plans, teacher observations, photographs, school newsletters, and meeting minutes. The collection of diverse types of data helps in creating an authentic assessment portfolio, capturing deep, system-wide changes and identifying strengths and weaknesses. This ongoing evaluation provides a clear understanding of the progress made and the steps needed to continue advancing toward sustainability goals.

In summary, the governance of green schools is multifaceted and involves a clear vision and mission, actionable plans, inclusive team structures, and rigorous monitoring and evaluation mechanisms. These elements work together to create a comprehensive approach to sustainability, fostering an environment where students, staff, and the wider community are engaged and committed to environmental stewardship.

## RESULTS

### Attribute 1 - Vision/Mission/Objectives/Values

**Vision statements:** The vision statements of green schools emphasize the need to produce responsible citizens who use resources sustainably, advocate for conservation, and act as problem solvers within their communities. For example, a vision statement for waste management in green schools might be "To prepare students to emerge as citizens that reduce, reuse, and recycle waste, becoming problem solvers in the larger community" (Wipro, 2019).

**Mission:** Green schools engage students in participatory and immersive activities related to sustainability themes, fostering knowledge and awareness throughout the year. An example mission statement for waste management could be "To engage every member of the school community in participative and immersive activities related to waste management throughout the year." - Coordinator, Jawahar Navodaya Vidyalaya, Jaffarpur Kalan, South West Delhi.

**Habits & Attitude:** Green schools reinforce environmentally responsible habits and behaviors by celebrating environment-related days and conducting regular assemblies on environmental topics. For example, schools may foster values such as system thinking and normative thinking in daily activities, particularly for biodiversity management.

**Objectives:** Objectives provide specific targets for green schools, which may include the following:

- Enable understanding of environmental and sustainability issues within the school community.

- Empower teachers with skills and strategies to integrate environmental concerns into their teaching.
- Motivate the school community to act responsibly towards the environment.
- Build teachers' capacity to use diverse teaching methods beyond traditional lecture formats.
- Encourage students to ask questions and engage in discussions on relevant topics.
- Model and demonstrate proconservation behaviors.

For example, objectives related to water management might include empowering teachers to incorporate water-related concerns into their teaching and encouraging students to explore and discuss water issues actively (Wipro, 2014).

## **Attribute 2 - Action plan and execution**

### **Step 1: Creating awareness**

- **Where we Are – The state of our environment:** Green schools begin by identifying their environmental challenges, understanding their causes, and recognizing the interconnections among these issues. This can involve exercises where participants reflect on past and present environmental conditions and their underlying causes.
- **Where you want to be – Your vision:** Vision statements guide green schools toward environmental goals, emphasizing value-building, inspiring the school community, and planning for a sustainable future.
- **How to get there – Changes required:** Green schools spread knowledge, promote pro-environmental habits and attitudes, and facilitate action through in-class and outdoor learning experiences. This includes using various school areas as learning tools by displaying relevant environmental messages (Nielsen et al., 2000).

### **Step 2: Taking action**

- **Building capacity:** Capacity-building programs of green schools focus on enabling teachers to understand environmental issues, integrate them into their teaching, act responsibly, use diverse teaching methods, encourage student inquiry, and model proconservation behaviors.
- **In-class and outdoor activities:** Green schools conduct both knowledge-based in-class activities and action-oriented outdoor activities, allowing students to connect classroom learning with real-world environmental issues.

- **Increasing greenery in the school:** Green schools undertake projects such as building waste management facilities, creating compost pits, developing gardens, and implementing rainwater harvesting systems. These activities involve students directly in greening their school environment (Wipro, 2016).
- **Awareness campaigns for communities:** Green schools engage in collaborative projects and student-led awareness campaigns with the local community to address environmental challenges and provide excellent learning opportunities.

### Step 3: Reflection

- **Journal for reflection:** Green schools encourage reflective practices, such as keeping journals to record thoughts, feedback, successes, and failures. This ongoing reflection helps inform future actions and improvements.

For example, an action plan for food management might include auditing food consumption and waste, setting goals, engaging the community through programs such as waste-free lunches and healthy (Countryman et al., 2007). Success stories and achievements are shared with the school community through assemblies and displays.

These attributes and actions collectively help green schools establish a culture of sustainability, ensuring that students, teachers, and the broader community are engaged in and committed to environmental stewardship.

### Step 4: Allocate days in calendar

To promote environmental awareness, a green calendar has been established, “designating specific days throughout the year for celebrating various environment-related events” – Principal, Jawahar Navodaya Vidyalaya, Bai, Nuh, Mewat, Haryana. These celebrations foster engagement among students and staff and reinforce the school’s commitment to sustainability.

### Attribute 3 - Team Structure

The school, Jawahar Navodaya Vidyalaya, Mohamaddpur-Saidpur, Gurugram, Haryana has organized its sustainability initiatives into specific themes, each managed by dedicated teams comprising teachers, students, and relevant staff. The structure is as follows:

*Theme Energy* - One teacher of Class 9, students of Class 9 and office staff and electrician

*Theme Food* - One teacher of Class 6, students of Class 6 and cooks and kitchen helpers.

*Theme Waste* - One teacher of Class 8, students of Class 8 and cleaners or maintenance staff.

*Theme Water* - One teacher of Class 7, students of Class 7 and housekeeping or maintenance staff.

*Theme Biodiversity* - One teacher of Class 5, students of Class 5 and gardeners.

#### **Attribute 4 - Monitoring and evaluation**

A robust monitoring and evaluation mechanism combines quantitative and qualitative assessments to ensure the effectiveness of green initiatives. Quantitative assessments are conducted by the WWF at the beginning and end of the year through questionnaires and surveys. In contrast, qualitative assessments are performed continuously by the school through student workbooks, projects, and teacher evaluations, which are documented via photos and videos (WWF, 2018).

Monitoring and evaluation strategies for green schools can be structured around clear targets, actionable interventions, measurable indicators, resource allocation, and outcome assessment. For example, for effective energy management, one of the targets could be to increase the percentage of nonpolluting vehicles such as cycles and walking, for which schools may introduce a policy requiring that students who reside within three kilometers of the school are not provided with bus services. Further, the effectiveness of this strategy is assessed by tracking the number of students who use bicycles, with a significant increase indicating progress. For these minimal resources, provision of secure bicycle stands near the school gate, is only required.

To reduce pollution from school transportation, the school can set a target to phase out half of the five-year-old vehicles and ensure that only low-emission vehicles are used. Progress on this target can be measured by the proportion of school-owned and operator-owned vehicles utilized, and renting operator-owned vehicles may be a necessary investment. The overall result of this approach is improved air quality around the school environment.

Additionally, schools can also aim to meet a proportion of their electricity requirements from renewable sources by installing solar panels. The monitoring process for this may include recording the kilowatt-hours of energy generated, considering the costs for installation, maintenance, and additional equipment such as batteries. Successful implementation of this strategy would result in reduced dependency on external electricity sources and the transition to sustainable energy.

Lastly, monitoring energy consumption at the individual level may involve organizing energy awareness campaigns, such as those described by Lewis (2010), and using energy monitoring to track decreases in consumption. While these

actions often require minimal financial resources, they result in notable savings in school electricity bills. Each of these strategies demonstrates the importance of setting clear objectives, applying targeted interventions, using quantitative and qualitative indicators, and assessing both resource use and outcomes to advance sustainable energy management within green schools.

## **DISCUSSION**

This study demonstrates that robust governance and active stakeholder engagement are foundational to the successful implementation of green schools in India. By developing clear institutional visions, defining actionable strategies, and structuring inclusive teams, schools can foster a culture of sustainability that extends beyond symbolic efforts to produce tangible, measurable outcomes. The findings corroborate international research advocating for a whole-school approach, in which governance mechanisms, participatory leadership, and comprehensive evaluation systems are integral to achieving lasting educational and environmental change.

### **Relevance to Research**

Notably, the insights generated from this research have implications for teacher preparation programs. The evolving landscape of education for sustainable development (ESD) calls for professional learning experiences that equip teachers with both the subject knowledge and the pedagogical skills to deliver transformative ESD curricula. Recent initiatives in India—such as the Green Teacher Diploma and specialized short-term courses—highlight the need for ongoing teacher capacity building in environment and sustainability education. Integrating modules on ESD theory, green pedagogy, and inter-disciplinary project-based learning into pre-service and in-service teacher education can ensure that educators across subjects feel genuinely prepared to model and lead sustainability practices in their schools.

### **Relevance to Policy**

Policy development, at both regional and national levels, must draw on the evidence presented here to mandate not only the inclusion of environmental content in school curricula but also the institutional structures necessary for effective delivery. Policy frameworks should incentivize schools to adopt a holistic approach to sustainability—embedding governance, continuous professional development, and active community engagement as core standards for recognition and support. Cross-sectoral policies that connect primary and secondary education

with higher education and teacher training institutions could advance India's commitment to the Sustainable Development Goals and reinforce systemic change.

To successfully establish green schools, strong leadership that acts purposefully, collaboratively, and with commitment to the sustainability agenda is imperative. Policymakers need to rethink what motivates contemporary students and consider how topics such as waste management, biodiversity conservation, greenhouse gas emissions, and malnutrition resonate with students today. They should also question the overarching goals of education in this context.

## Relevance to Practice

For school leaders and educators, this research provides a practical framework for creating and sustaining green schools. Key strategies include developing a clear vision, mission, objectives, and values that guide strategic planning and the implementation of green practices. Action plans should delineate roles, set goals, conduct audits, engage the community, and report achievements. A dedicated greening team, which is inclusive of all stakeholders, is essential for fostering a sense of environmental responsibility.

This study emphasizes the importance of monitoring and evaluating both quantitative and qualitative data to assess progress and identify areas for improvement. Quantitative assessments might include energy audits and attendance records, whereas qualitative assessments could involve student work samples and meeting minutes. These comprehensive evaluation methods ensure continuous improvement and support holistic environmental change in schools.

Crucially, the integration of ESD into higher education curricula is an area for significant growth. Teacher training colleges, universities, and professional development providers can leverage the governance strategies and stakeholder methodologies identified in this study to design new modules, research projects, and field placements centered on sustainability challenges. Embedding ESD objectives in the standards for higher education and teacher preparation ensures that graduates—whether as educators, policy leaders, or sector professionals—are equipped with the competencies necessary to nurture environmentally conscious and engaged citizens.

## IMPLICATIONS

The findings of this research have several significant implications for policy makers, school leaders, educators, and the broader school community.

1. *Policy development and implementation:* This study underscores the need for robust policies that integrate education for sustainable development (ESD) into the core of school governance and operations. Policy makers should consider developing comprehensive guidelines that mandate the

inclusion of sustainable practices in all aspects of school life, from curriculum development to infrastructural modifications.

2. *Curriculum integration*: Schools should incorporate themes of sustainability, such as energy, water, waste, food, and biodiversity, into their curricula. This approach aligns with the whole-school approach advocated by numerous studies, which emphasizes embedding sustainability into teaching and learning, thereby fostering an environment where students learn through practical engagement and real-world applications. (Gleeson & Morrissey, 2024)
3. *Stakeholder engagement*: Effective stakeholder engagement is crucial for the successful implementation of green initiatives. Schools should foster a culture of collaboration among teachers, students, parents, and the community to ensure widespread support and active participation in sustainability efforts. This collective approach can lead to more sustainable and impactful outcomes.
4. *Leadership and governance*: Strong leadership is essential for driving the sustainability agenda within schools. School leaders must be committed to the vision of a green school and work collaboratively to create and implement action plans that promote environmental responsibility. This involves setting clear goals, delineating roles, and continuously monitoring and evaluating progress.
5. *Resource allocation and management*: Adequate resources—both financial and human—are necessary to support the transition toward greener schools. This includes investing in renewable energy sources, improving waste management systems, and enhancing water conservation measures. Schools need to allocate sufficient resources for training staff and students to develop the skills required for sustainable practices.
6. *Monitoring and Evaluation*: Continuous monitoring and evaluation are vital for assessing the effectiveness of green initiatives. Schools should employ both quantitative and qualitative methods to track progress, identify areas for improvement, and celebrate achievements. This can include energy audits, surveys, and documenting student projects and activities.

## CONCLUSION

In conclusion, this research highlights the transformative potential of green school practices, emphasizing their importance in fostering a sustainable future through education. Effective governance and stakeholder engagement are pivotal to the success of green schools, enabling them to integrate sustainability into their core operations and culture. By adopting the strategies identified in this study, schools can become models of environmental stewardship, influencing not

only their immediate communities but also contributing to broader societal changes.

The implications for policy, practice, and future research are profound. Policymakers, educators, and researchers must collaborate to support the development and implementation of green school initiatives, ensuring that sustainability becomes an integral part of the educational landscape. This collective effort will help cultivate environmentally conscious individuals who are well prepared to address the challenges of sustainability in the 21st century.

In summary, this study advances a comprehensive framework for green school governance and stakeholder engagement grounded in both international best practices and local innovation. By foregrounding actionable strategies for leadership, teacher preparation, and policy reform, the research provides scalable pathways for transforming not only individual schools but also the broader educational landscape. The key takeaway is clear: effective governance and inclusive stakeholder engagement, supported by targeted teacher training and coherent policy frameworks, are prerequisites for embedding sustainability at every stage of education. Embracing these principles will support schools and educators in developing the next generation of environmental stewards, equipped to address urgent sustainability challenges in India and beyond.

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### **Acknowledgment**

The author would like to acknowledge the use of OpenAI's Perplexity in [assisting with the drafting and editing of this manuscript / generating text / refining language / ensuring clarity and coherence throughout the article]. The AI tool provided [support / assistance / valuable insights] in [generating text, refining language, and ensuring clarity and coherence]. The contributions made by Perplexity were [invaluable / significant / helpful] in enhancing the overall quality of this work.

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