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GREEN SCHOOLS: A GLOBAL TREND IN THE EDUCATION FOR SUSTAINABILITY

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Abstract: This article is written with the intent of knowing the history of green schools, further the article also focusses on the need for green schools in India and finally what problems are being faced in the implementation of the concept of green schools in India are being addressed in this article. The review of literature was conducted in order to answer the research questions and fulfil the objectives of the present study.

Key Terms: Green Schools, Sustainable Development, Green Curriculum, Education for Sustainable Development

Introduction

Green schools embody an innovative educational philosophy that focuses on environmental stewardship, sustainable practices, and the holistic development of students and faculty. These environmentally conscious institutions emphasize efficient energy use, water management, eco-friendly materials, and minimized waste production. They integrate sustainable power sources, embed environmental awareness in their teaching, and foster community partnerships. These institutions create optimal learning spaces while molding environmentally conscious future leaders. A Green School maintains pristine, wholesome, secure, and environmentally sound surroundings. It supports students' physical and mental wellbeing through comprehensive services like nutrition programs and counseling. The facility ensures sanitary conditions with safe water, well-maintained classrooms, recreation areas, and gardens. It maintains a secure environment free from substances, physical punishment, and intimidation, while connecting students with nature and encouraging environmental stewardship.

It demonstrates inclusivity by:

- Providing facilities that accommodate all learners, including those with special requirements, to support their education.
- Promoting mutual respect, human dignity, and equal treatment.
- Avoiding bias, prejudice, or stereotyping based on social status, beliefs, gender, cultural background, faith, or capabilities.
- Acknowledging and adapting to students' varied backgrounds and requirements (considering gender, social context, culture, and learning abilities).

It enhances learning effectiveness by:

- Implementing age-appropriate educational methods that support collaborative and democratic learning experiences.
- Creating suitable learning conditions with relevant content, tools, and educational resources.

It promotes stakeholder engagement by:

- Building reciprocal relationships between the institution and its community members (students, parents, School Management Committees, Village Education Committees, and broader society) through active participation in various school-based and external activities.

In summary, a Green School empowers its community, particularly students, through critical thinking and experiential learning. It adopts interactive, hands-on, and team-based approaches to enhance the educational environment's health standards. The school engages the entire community in working toward environmental sustainability.

Transforming traditional schools into Green Schools requires a fundamental shift in current educational approaches.

Objectives

1) **To review a brief history of green school movement in the world.**
2) **To study the problems faced in the implementation of green schools in India.**

Research Questions

What is the need of green schools in India?

Methodology

The present research is based on extensive review, related to the green school movement in the world and its evolution and implementation of green school concept in the world. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), was used as a technique for conducting review of secondary data in the form of research articles, reports, publications etc. The problems being faced in the implementation of green schools in India were also studied by reviewing the documents and research articles. Documents of UNESCO related to Education for Sustainable development, and various other reports, research articles and documents were analyzed.

Sources of Data

For the present study secondary data is used. The data is in the form of published research articles in India as well as the articles published by foreign countries. The documents published on green schools and green curriculum by International Agencies such as UNESCO, World Health Organization, OECD, NCERT in India are also consulted and used as a source of data in the secondary form.

Analysis of the data

The data was analyzed using thematic analysis and as such the theme wise reporting was done in alignment with the objectives of the study, which is reported as under

Objective 1: To review the history of green school movement in the world in brief.

A Short Historical Background of Green Schools

The Brundtland report of 1987, titled "Caring for our Future," advocated for a fundamental change in behavior to ensure a sustainable future. The report highlighted the importance of conserving Earth's natural resources. Following this landmark document, several organizations including the International Union for Conservation of Nature (IUCN), World Wide Fund for Nature (WWF), and United Nations Environmental Programme collaborated to publish "Caring for the Earth." This subsequent report outlined a strategic approach promoting sustainable living ethics and provided practical guidelines for implementing these principles. The core focus remained on environmental respect and preservation, while also creating frameworks to balance development with nature conservation.

The publication of the Brundtland Report sparked increased worldwide focus on sustainable development. The United Nations' Agenda 21, which emerged from the 1992 Rio de Janeiro Earth Summit, stressed the importance of improving social, economic, and environmental aspects of human settlements to enhance living and working conditions universally (UN, 1992). This summit also introduced Education for Sustainable Development (ESD), a concept that has since been described using various terms including Education for Sustainability, Education for a Sustainable Future, Environmental Education, and Developmental Education (Fien & Tilburry 2002).

The ongoing evolution of Education for Sustainable Development (ESD) led to the establishment of environmentally conscious educational institutions, commonly known as the Green School Movement. While interpretations of "Green Schools" vary, similar to ESD (Education for Sustainability), these institutions are broadly recognized as educational vehicles supporting ESD objectives. They function as establishments aligned with the United Nations' 17 Sustainable Development Goals (SDGs). The educational sector demonstrated quick adaptation to ESD initiatives, evidenced by the Foundation for Environmental Education (FEEE) launching Eco-Schools across Europe in 1994 and the establishment of the United States Green Building Council in 1993.

Features of Green Schools:

Energy Conservation: Green schools employ advanced design principles to maximize energy efficiency, implementing cutting-edge technologies that minimize power usage, decrease carbon emissions, and reduce utility expenses.

Resource Management: Green schools adopt comprehensive waste management approaches, incorporating recycling initiatives and selecting sustainable materials, to decrease landfill impact.

Environmental Design: These institutions select strategic locations and integrate natural elements, wildlife preservation, and minimal light interference in their architectural plans.

Public Participation: They actively collaborate with local communities in environmental initiatives, building relationships with nearby organizations and promoting sustainable practices among students and their families.

Enhanced Air Standards: Green schools emphasize superior indoor air quality through advanced ventilation design, eco-friendly materials, and measures to reduce allergens, creating optimal learning conditions.

Green schools deliver multiple advantages, including enhanced student learning outcomes, decreased operational expenses, minimized environmental impact, and cultivating environmental awareness in youth. They serve as catalysts for environmental change by developing ecological consciousness early and decreasing education's environmental impact.

Global Green School Implementation Examples

BedZed Development, London, UK

BedZed represents an eco-friendly community featuring a primary school dedicated to sustainability. The facility achieves carbon neutrality through energy-efficient construction, natural air circulation, solar technology, and water conservation systems. Students engage in environmental learning and participate in monitoring facility energy usage.

Sidwell Friends School, Washington, D.C., USA

This K-12 institution demonstrates environmental leadership with its LEED Platinum-certified middle school featuring *geothermal climate control*, rooftop gardens, and solar installations. The campus maintains an organic garden and provides comprehensive environmental education.

Greensburg Green Town, USA

Following tornado destruction in 2007, Greensburg, Kansas rebuilt sustainably. Kiowa County Schools constructed an eco-friendly facility incorporating geothermal systems, efficient illumination, and sustainable building materials, aligning with community environmental goals.

Green School Bali, Indonesia

This international institution emphasizes environmental education and sustainability. The facility features bamboo construction throughout, while students learn about sustainable agriculture, renewable power, and ecosystem preservation. Waste reduction and environmental responsibility remain core priorities.

The Kings Academy, Jordan

Jordan's Kings Academy demonstrates sustainability through innovative campus design. Features include energy-efficient lighting, rainwater collection, and water reuse systems. Students participate in extensive environmental education focusing on preservation and sustainability principles.

Green School Quality Standard

The Green school quality standard serves as a thorough framework established to align various school accreditation systems, encompassing school certifications, awards, institution-based programs, and projects showing dedication through a WIA to ESD approach. This framework incorporates sustainability and climate action principles into schools' everyday operations, decision processes, educational activities both inside and outside classrooms, and community engagement efforts. This standard's core purpose is to deliver a comprehensive educational experience

ensuring seamless progression across all educational levels – beginning from early childhood through to tertiary education – empowering students to succeed in a sustainable, interconnected global environment.

Early childhood education establishes crucial groundwork by exposing young learners to sustainability concepts early, while higher education reinforces these principles within advanced academic settings and professional environments. This educational journey must be considered within lifelong and life-wide learning contexts. Lifelong learning emphasizes that education continues beyond traditional schooling throughout an individual's lifetime. When sustainability values are introduced early and strengthened through higher education, people are better positioned to maintain eco-conscious and climate-friendly practices throughout their lives. Life-wide learning recognizes that education happens across various settings beyond traditional classrooms, including domestic environments, community spaces, and professional settings.

The Standard presents a methodical framework that simplifies the comprehensive transition toward climate-ready education and equips educational institutions with necessary resources for addressing everyday challenges. Its objectives include:

- Establish specific Green School benchmarks covering diverse educational and sustainability aspects that motivate institutions to implement sustainable, innovative practices for reducing environmental impact, optimizing resource usage, and strengthening environmental consciousness and collective responsibility within school communities.
- Provide a standardized framework for evaluating and certifying Green Schools across varied socio-economic, geographic, and cultural settings, supporting their sustainability targets while championing equity and ensuring inclusive ESD access, thereby minimizing educational opportunity gaps.
- Create systems that encourage ongoing improvement, providing certified schools with opportunities to advance their sustainability initiatives.
- Support Green Schools' active participation in achieving SDGs, contributing to global initiatives addressing climate change, biodiversity preservation, and related challenges.

Effective Methods for Establishing Environmental Education Excellence Standards

Choosing to transform into a Green School marks the start of a journey, not its conclusion, integrating sustainability principles across all aspects of school operations. When effective, this initiative changes more than physical infrastructure - it reshapes individuals' lives through the acquired competencies and environmental values that become embedded within the school community. Accreditation programs should motivate schools to excel beyond basic certification, offering continuous opportunities for growth and quality enhancement. Regular assessment and performance tracking play vital roles in measuring advancement and assisting institutions with successful program execution. Accreditation bodies are advised to perform periodic evaluations of certified schools after they meet initial requirements. In this context, implementing a tiered system that acknowledges schools' additional

achievements in their environmental education journey beyond baseline standards could prove valuable and be recognized through supplementary certifications.

Essential Elements of Environmental Education Quality Framework

Green Schools serve as catalysts for transforming society by cultivating environmental awareness in upcoming generations and fostering sustainable mindsets. Through incorporating environmental education and sustainable development into their teaching approach, Green Schools enable students to develop into engaged citizens who champion eco-friendly practices and climate initiatives. These institutions cultivate global awareness, motivating students to become environmental stewards and drive positive change within their local areas. The impact of Green Schools extends into the broader community. These institutions collaborate with community partners to amplify environmental stewardship messages. Through their exemplary practices, Green Schools motivate other organizations to embrace sustainable operations and climate-conscious approaches in their design and function.

To implement this vision, this Standard outline a thorough framework for Green School development, structured around four essential components:

School governance: Green Schools' leadership promotes sustainability through policy implementation and resource distribution, ensuring collaborative decision processes, encouraging participation from various stakeholders including students, teachers, and community members, and establishing enduring commitment to environmental responsibility.

Facilities and operation: Green Schools adopt sustainable methods across energy consumption, water conservation, waste handling, food services, and infrastructure design, thereby minimizing carbon emissions and ecological footprint, safeguarding occupant wellness, cultivating environmental responsibility, and setting an example for neighboring communities.

Teaching and learning: Green Schools prioritize education for sustainable development within their curriculum, helping students develop comprehensive understanding, analytical capabilities, solution-focused approaches, and global awareness, preparing them to tackle complex environmental and sustainability challenges effectively.

Community engagement: Green Schools partner with various community stakeholders to enhance sustainability initiatives, thereby broadening educational opportunities, sharing resources, and fostering public participation, establishing Green Schools as centers of resilience and climate action for both prevention and adaptation that motivate and activate the wider community. Acknowledging the vital link between safety, resilience, and sustainability in schools, the green school quality standard has been integrated with the Comprehensive School Safety Framework (CSSF).

The school governance element links to the Enabling systems and policies component of CSSF to highlight the implementation of essential systems, protocols, and management frameworks that reinforce safety, resilience, and sustainability programs within the school.

The Facilities and operations aspect incorporates provisions for secure learning environments and school safety and educational continuity management from the CSSF to merge safety and sustainability concepts into school facility design and management.

The Teaching and learning element, combined with the Community engagement aspect, supports the Risk Reduction and Resilience Education component of CSSF by integrating climate change awareness, disaster risk reduction, and education for resilience and proactive climate and sustainability measures into the curriculum while connecting with local communities through an inclusive societal approach.

By connecting these frameworks, the Standard moves beyond physical protection to create spaces that both safeguard and empower learners, building a culture of resilience and sustainability that equips them to pursue creative solutions to climate and sustainability challenges.

Green Schools in India

An Eco-Friendly School must demonstrate environmental consciousness by fulfilling these requirements:

- Maintain a minimum window-to-floor ratio (WFR) of 5 percent to ensure proper natural light and air circulation
- Most students and staff should utilize eco-conscious transportation methods (buses, electric vehicles, etc.) or zero-emission options (bicycles, walking, etc.)
- Prioritize power-saving lighting solutions to reduce energy consumption and implement renewable energy sources. GSP Audit promotes minimal usage of traditional lighting while ensuring adequate illumination for students
- Develop extensive greenery within and surrounding school grounds with rich biodiversity through indigenous plant varieties
- Provide freshly prepared meals (excluding processed snacks high in fats, sugar and salt) to promote nutritious eating habits
- Install rainwater harvesting (RWH) structures and reuse processed wastewater
- Regular RWH system maintenance before and after monsoon seasons is essential
- Practice efficient waste separation and responsible disposal. Target minimum 90 percent waste recycling
- Convert organic waste into compost
- Strictly prohibit waste incineration

One hundred ninety-nine educational institutions across India received 'green' certification at Centre for Science and Environment's (CSE) yearly Green Schools Awards ceremony. Twenty schools emerged as category leaders for their exemplary dedication to creating eco-friendly campuses and environmentally aware students.

These recognitions are bestowed annually through CSE's Green Schools Programme, an established 19-year initiative that guides schools and students in conducting thorough environmental assessments to evaluate their resource efficiency and sustainability practices. Educational institutions independently manage their environmental progress through self-administered audits under CSE's supervision.

During the event, CSE director general Sunita Narain emphasized: "CSE's Green School Programme serves as a practical laboratory. It aims to educate youth through direct involvement – they demonstrate sustainability through action. We maintain that practical implementation of ideas, measuring outcomes, and establishing future targets leads to optimal learning. This embodies the essence of our Green Schools Programme."

Punjab secured both the "best state" and "best district" honors for demonstrating excellence in promoting environmental awareness.

Best State and District**:** Punjab claimed the Best State recognition by achieving the highest number of audit registrations and submissions. The state saw 4734 schools submit audit reports, with 70 achieving 'green' ratings. Sangrur district in Punjab earned the Best District Award, recording 503 submissions.

Q. **What is the need of green schools in India?**

The review of documents and research articles helped in the answering the research question and it is discussed as follows

Need for Green Schools in India

Green schools help in creating an environment that nurtures a child's psychological, social, intellectual, and emotional development while instilling a sense of responsibility towards building a sustainable future for generations to come. This approach fosters creativity and deepens children's understanding of eco-friendly schools, enabling them to become future environmental advocates in their communities.

2. Providing sensitization regarding environmental and resource sustainability:

Studies indicate that school premises and public spaces often suffer from littering and resource wastage due to limited awareness among community members in both urban and rural settings about waste management practices like recycling and reuse. While environmental topics and pollution-related issues are covered in school curricula, students rarely encounter practical demonstrations, limiting their learning potential. Additionally, school stakeholders often lack knowledge about effective practices that could enhance the environmental conditions within and around educational institutions. The Green & Sustainable Schools concept serves as a platform to educate

various stakeholders about environmentally conscious daily practices and space utilization. This evolving process emphasizes the current generation's responsibility to restore ecological balance and prevent further environmental degradation.

3. For inculcating sustainable values in the educational stakeholders:

Green & Sustainable Schools effectively promote sustainability values among all school stakeholders - students, educators, administrators, School Management Committees, community members, and government officials. The core principles emphasized include efficient resource utilization, waste minimization, and maximizing recycling and reuse practices.

4. For striking a balance between society, economy, and environment:

A green school/sustainable school operates on the principle of "sarve bhavantu sukhinah…" encompassing care for oneself, others, and the planet. These institutions implement effective resource management strategies to control waste, including environmental resources. Their teaching methods and practices shape students' mindsets and behaviors towards sustainability. This aligns with NEP 2020's vision of creating sustainable schools that deliver quality education.

5. Fosters the initiatives to improve school climate and attitude of children:

Community engagement serves as a simple yet powerful approach to energize schools and establish them as regional leaders. Activities such as gardening, yoga education, and celebrating various occasions (Khel Diwas, Vigyan Diwas, Vishwa Jal Diwas, School Suraksha Diwas, Swatantrata Diwas) stimulate critical thinking among students. Both educators and students must strive towards developing more open-minded perspectives.

6. For ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all:

Sustainable and high-quality educational institutions must incorporate several essential elements: inclusivity, equity, academic excellence, and the promotion of continuous learning. In this era of technological advancement, maintaining ethical standards and core values remains crucial. Active listening and respecting diverse perspectives play a vital role. To transform schools into sustainable, high-quality institutions, efforts can be concentrated around four primary themes:

- Waste management
- Green projects
- Innovations & events
- Social action

Sustainability principles should be seamlessly integrated into daily school operations, becoming an inherent part of routine practices. The planned curriculum should encompass providing opportunities, encouraging student participation, and facilitating diverse activities. Emphasizing practices such as reusing, rebuilding, repairing, and recycling is fundamental.

For preparing global leaders in the field of sustainable development:

Green schools excel at developing adaptable leaders who can modify their leadership approach or transition leadership roles based on situational demands, whether at local, national, or global levels. Contemporary environmental challenges, including climate change and diminishing natural resources, require leaders who are deeply aware and sensitive to these issues. These leaders must leverage their innovative thinking and intellectual capabilities to address the complex challenges facing modern societies.

For nurturing creativity among young minds:

The age-old wisdom that "nature is the best teacher" resonates strongly in education. Swiss psychologist Jean Piaget aptly referred to young children as "little scientists," acknowledging their inherent creativity and natural curiosity for exploration. Green schools play a crucial role in channeling these qualities by raising awareness about environmental concerns and related issues among these young minds. This guidance not only nurtures their creative potential but also directs it toward developing innovative solutions for current environmental challenges. This dual benefit serves both the children's creative development and society's needs, as their innovative thinking patterns lead to practical solutions for community problems.

Accreditation scheme providers include international organizations, government bodies, and non-profit/civil society groups that grant formal recognition and certification to educational institutions based on their ESD initiatives, particularly regarding climate change education. These organizations drive ESD implementation and climate preparedness in schools, deliver assistance to meet established targets, and evaluate institutions through progress monitoring and benchmarking systems. Furthermore, the Standard guides accreditation program implementers including educational authorities across various levels, civil society organizations, academic institutions, community learning centers, and policymakers in developing school-focused climate change and education policies. To meet the Standard's minimum alignment requirements, accreditation programs must incorporate at least one-third of the recommended activities across all four core dimensions of a Green School, with one crucial action specified per dimension. Continuous improvement is recommended to gradually implement higher percentages of suggested activities over time, demonstrating an ongoing dedication to sustainable school practices.

Objective 2: To study the problems faced in the implementation of green schools in India.

For the fulfilment of the objective 2, documents were analyzed and research articles were reviewed and based on that the following points were extracted and discussed as under

Green School Implementation Barriers

Knowledge Gaps: For the proper implementation of any program or policy the very first prerequisite is the knowledge and awareness related to the policy or program. As far as the concept of green school is concerned there is a lack of knowledge and awareness among the stake holders particularly at the school level. The students as well as the teachers are not aware about the concept of green schools as a result it hinders the implementation of green schools.

Infrastructure Deficiencies: Many educational institutions in India, particularly in rural and semi-urban areas, lack basic infrastructure facilities, making it challenging to implement sustainable practices.

Policy Constraints: While there have been some initiatives to promote sustainability in education, India lacks a comprehensive national policy framework that mandates and guides the integration of environmental sustainability principles across all levels of education.

Management Complexities: The management be it the school management, the college management, management at the district state and national level. The formal system in the management has a lot of do's and do not's. For the implementation of any new concept, it takes a lot of formalities to be done before its implementation and owing to these formalities it becomes quite difficult due to these management complexities to implement a new program, policy or concept.

Resource Limitations: Insufficient funding and resources for comprehensive green education programs. Lack of trained teachers and educational materials focused on environmental topics are the important resources needed for the environmental education. However, in India there is a lack of most of the resources especially funding and trained and sensitized teachers. As a result, it acts as a barrier to the implementation of green schools in India.

Educational Reform Resistance: Education is the base for any other system. It is the proper education which helps in the bringing of change in the society as well in the country at large. But the present educational system was resistant to reforms, however the new national policy 2020 has initiated several reforms in every aspect of education.

Limited Availability of Green Building Materials and Technologies: India's construction industry is still in the process of transitioning towards sustainable building materials and technologies. The limited availability and higher costs of green building materials, renewable energy systems, and water-efficient fixtures can impede the adoption of sustainable practices in educational institutions, particularly in remote areas.

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