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MODULE

4

The DNA of Whole School Sustainability

KRISHNAJI PAWAR - CEO & FOUNDER

LEED AP(BD+C),GSAS CGP,GCP,ISO 14001

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Whole School Sustainability (WSS) is a comprehensive educational approach that integrates sustainable practices across all aspects of a school's functioning, focusing on vision, leadership, curriculum integration, community engagement, resource management, and cultural change.

Learning Objectives

- Introduction
- Getting Started with Green School Buildings
- What Does a Successful Green School Look Like?
- **The DNA of Whole School Sustainability**
- Teaching projects and problem-based learning
- Green School Management, Aesthetics, and Efficiency
- Design Principles for Whole School Sustainability
- Policy, Safety, and Diversity, Equity, and Inclusion in Green Schools
- Green Building Basics and Cost Benefits
- Healthy Ecosystems for Learning



INTRODUCTION

- Holistic approach to education integrating sustainable practices.
- Systems-thinking approach, integrating sustainability as a foundational component.
- Visualized as a DNA helix, each strand representing a critical component.
- Centered on a clear vision and strong leadership committed to sustainable values.
- Integrates sustainability concepts into the educational framework.
- Fosters community engagement for enhanced learning and shared responsibility for sustainable practices.
- Involves strategic resource management to minimize waste and maximize efficiency.
- Promotes a school culture that values sustainability, influencing behaviors and attitudes.

WHOLE SCHOOL SUSTAINABILITY: THE DNA OF THE CONCEPT

- Core Principles of Whole School Sustainability
- Interconnectedness: The principle of interconnectedness suggests that environmental, economic, and social systems are interrelated.
- Systems Thinking: This approach encourages educators and students to view challenges through a multifaceted lens.
- Lifelong Learning: Whole school sustainability promotes lifelong learning by fostering an environment where students engage in inquiry-based learning about sustainability issues.



STRUCTURAL COMPONENTS OF WHOLE SCHOOL SUSTAINABILITY

- Curriculum Integration: Integrating sustainability into the curriculum through interdisciplinary approaches enriches the learning experience.
- Facility Management: Sustainable facility management includes energy-efficient buildings, water conservation systems, and sustainable landscaping practices.
- Community Engagement: Schools can serve as community hubs for sustainability initiatives, fostering partnerships with local organizations and promoting a culture of sustainability.





STRATEGIES FOR IMPLEMENTATION

- Leadership and Governance: Establishing a sustainability committee that includes students, teachers, administrators, and community members oversees the development and implementation of sustainability initiatives.
- Professional Development for Educators: Providing ongoing professional development equips teachers with the necessary skills and resources to incorporate sustainability concepts into their lessons.
- Monitoring and Evaluation: Establishing metrics for monitoring and evaluating sustainability efforts is essential for long-term success.



IMPACT OF WHOLE SCHOOL SUSTAINABILITY

- Student Outcomes: Implementation of WSS has been associated with numerous positive outcomes for students, including enhanced academic performance, improved health and well-being, and increased civic engagement.
- Community Benefits: WSS initiatives contribute to broader community resilience and sustainability, serving as models for local businesses and organizations.



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HOW SUSTAINABILITY EVOLVED

EVOLUTION OF SUSTAINABILITY

- Forces responsible for sustainability include social issues, economic concerns, resource allocation, environmental damage, population growth, access to potable water, health, and energy usage.
- Sustainable development is a priority of a new world agenda.
- Examines causes and effects of global problems like urban development, population growth, and energy use.
- Examines the nature and scope of policies supporting sustainable development.





MAJOR UNDERLYING CAUSE:

- POPULATION GROWTH
- A SECOND MAJOR UNDERLYING CAUSE: URBAN DEVELOPMENT
- A THIRD UNDERLYING CAUSE: INCREASING ENERGY USAGE



ENERGY: SOCIETY'S MOST CRITICAL RESOURCE

POPULATION GROWTH

- Population growth, with the world's population more than doubled in the past 50 years, has increased consumption of resources, contributing to environmental degradation and climate change.
- Sustainable practices must be integrated to address challenges posed by population growth, including promoting renewable energy, water conservation, biodiversity protection, and waste reduction.
- Education and awareness are essential to foster a culture of sustainability and encourage responsible consumption and production.
- Prioritizing sustainable practices is crucial for a healthy planet for current and future generations.





URBAN DEVELOPMENT

- Urban development refers to the growth and expansion of cities through the construction of buildings, roads, and infrastructure.
- It is driven by factors such as population growth, economic development, and changes in land use patterns.
- Urban development contributes to environmental degradation through the loss of natural habitats, leading to ecosystem destruction and displacement of wildlife.
- Urban development also leads to increased pollution and waste generation due to the demand for resources like water, energy, and raw materials.
- Urban development can exacerbate climate change by releasing greenhouse gases, contributing to global warming and causing environmental changes.
- Policymakers, planners, and developers should consider the environmental consequences of urban growth and implement sustainable practices to mitigate these impacts.



INCREASING ENERGY USAGE

- Population growth: Increased population necessitates more energy for powering homes, schools, and businesses.
- Technological advancements: New technologies like electric vehicles and electronic devices require more energy for efficient operation.
- Industrialization: As industries expand and modernize, their energy requirements also increase.
- Lifestyle changes: Increased travel, air conditioning, and electronic devices increase energy consumption and usage.
- Solutions: Countries may need to increase energy production and distribution capabilities, build new power plants, expand renewable energy sources, and improve energy efficiency.
- Balancing benefits with environmental and social impacts is crucial.
- Sustainable ways to meet energy demand while minimizing negative consequences are essential.



ENERGY: SOCIETY'S MOST CRITICAL RESOURCE



- Energy production is centralized, while energy utilization is decentralized.
- External costs include environmental and air pollution, cap-financial accessibility, and social fairness.
- Companies are increasingly absorbing these costs due to circumstances.
- Energy-efficient use can greatly benefit the built environment.
- This includes supporting urban growth while minimizing environmental impact and avoiding the need for new power plants.
- Technologies are available for more efficient energy use.
- The global energy production and transmission efficiency index shows a 70% recovery rate, indicating potential for further energy efficiency advancements.

ENERGY: SOCIETY'S MOST CRITICAL RESOURCE



Sources of Energy

- Fossil Fuels: Non-renewable resources from ancient organic matter, primary energy source for many countries.
- Renewable Energy: Natural, replenishable sources like solar, wind, hydroelectric, and geothermal energy.
- Nuclear Energy: Controversial due to safety and waste disposal concerns.

Energy Consumption

- Rapid increase in energy demand due to societal growth and development.
- Need to reduce energy consumption and transition to cleaner, more sustainable energy sources.

Conclusion

- Energy is society's most critical resource, enabling comfortable and productive lives.
- Prioritizing energy efficiency, conservation, and renewable energy development is crucial for a sustainable future.

TECHNICAL SOLUTIONS:
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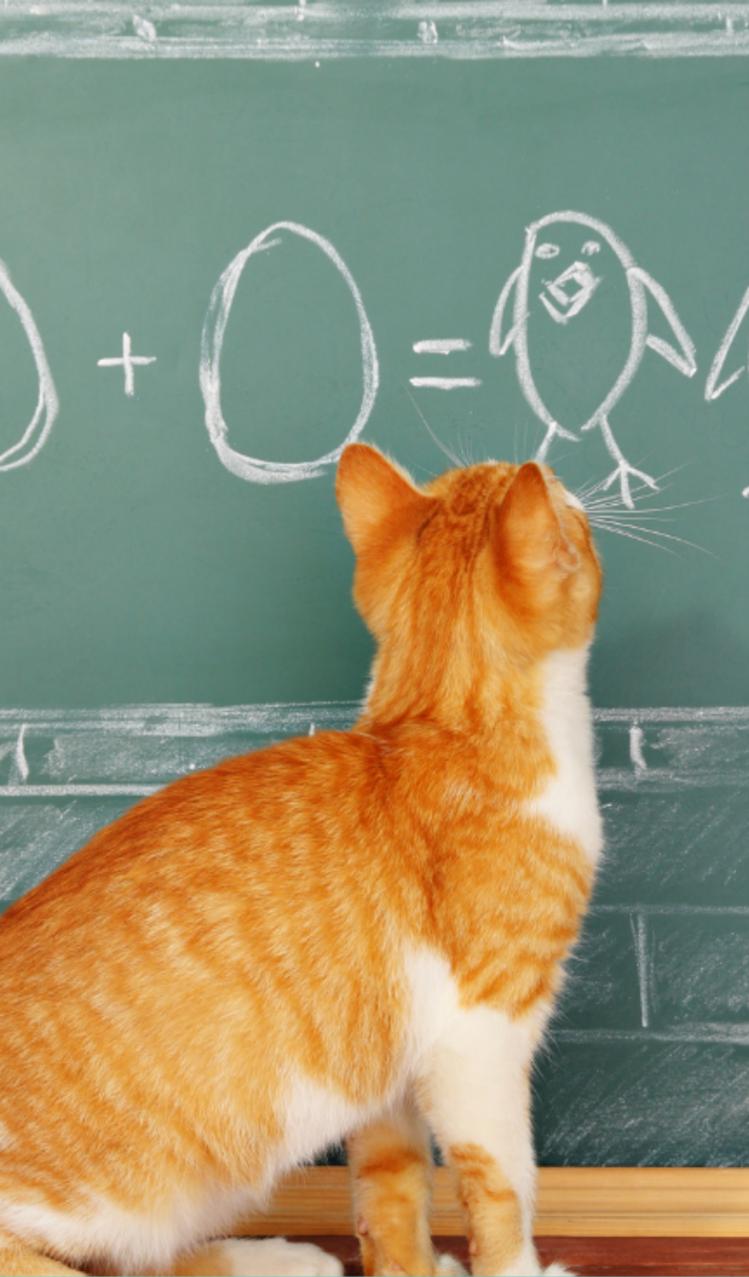


ENVIRONMENTAL DETERIORATION

- Environmental deterioration is the decline in environmental quality due to human activities and natural processes.
- Pollution, including air, water, and soil pollution, harms wildlife and contaminates ecosystems.
- Deforestation leads to habitat loss, soil erosion, and increased greenhouse gas emissions, disrupting ecosystems and potentially causing species extinction.
- Climate change, caused by burning fossil fuels, increases greenhouse gas emissions and global temperatures, causing more frequent and severe weather events.
- Overexploitation of natural resources like fishing, mining, and deforestation leads to rapid resource depletion, causing loss of biodiversity and ecosystem services.
- Sustainable practices, such as using clean technologies, conservation efforts, and transitioning to renewable energy, can combat environmental deterioration.



ENERGY: SOCIETY'S MOST CRITICAL RESOURCE



- Sustainable development and sustainability are theoretical constructs with varying implications.
- Sustainability is a set of policies, programs, and initiatives with unique implications.
- The concept of sustainability is not a universal solution to global problems.
- Factors contributing to sustainability include social issues, economic concerns, resource allocation, environmental damage, population growth, access to potable water, health, and energy usage.

URBAN DISLOCATION

- Refers to displacement or uprooting of individuals, families, and communities from urban areas.
- Factors include gentrification, urban renewal projects, natural disasters, and economic downturns.
- Gentrification: Wealthier individuals or businesses move into lower-income neighborhoods, increasing property values and rents.
- Urban renewal projects: Demolishing or renovating older buildings or neighborhoods can displace residents and businesses.
- Natural disasters: Force evacuations due to safety concerns or property destruction.
- Economic downturns: Rising job loss and foreclosure rates lead to increased homelessness and instability.



URBAN INFRASTRUCTURE CHANGES AND RAPID URBANIZATION



- Urban infrastructure refers to the physical systems and structures supporting city functioning, including transportation networks, utilities, communication systems, and public services.
- Rapid urbanization strains existing infrastructure, leading to overcrowded transportation systems, inadequate water and sanitation facilities, and insufficient public services.
- Cities like Mumbai, India, have experienced congestion due to the influx of migrants, and water and sanitation systems struggle to keep up with the growing population.

URBAN INFRASTRUCTURE CHANGES AND RAPID URBANIZATION +



- To address these challenges, cities must invest in upgrading and expanding their infrastructure, including building new roads, improving water and sanitation facilities, and expanding access to essential services.
- Cities are likened to living organisms, needing efficient transportation networks to connect residents to jobs, schools, and essential services.
- Failure to invest in urban infrastructure can lead to congestion, shortages, and other challenges hindering city development.

SUSTAINABILITY, ENERGY, AND CITIES: A HOLISTIC APPROACH

- Sustainability involves meeting present needs without compromising future generations' ability to meet their own needs.
- Cities are crucial due to their high concentration of people and resources, leading to significant global energy consumption, greenhouse gas emissions, and waste generation.
- Energy efficiency is key in urban sustainability, reducing carbon footprint and lowering energy costs through retrofitting buildings with energy-efficient systems.
- Renewable energy sources like solar panels, wind turbines, and hydropower plants can generate clean energy without depleting finite resources or contributing to climate change.





CONTACT US



+91 6363032722



info@beyondsmartcities.in



learn.beyondsmartcities.in



#55,HMR Layout ,Bengaluru ,India



THANK YOU

