K. K. WAGH EDUCATION SOCIETY, NASHIK
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati,
Nashik - 422 003, Maharashtra

Green Initiatives
By
K. K. Wagh Institute of Engineering Education & Research (KKWIEER), Nashik

Preamble

K. K. Wagh Institute of Engineering Education & Research (KKWIEER), Nashik, is committed to creating a sustainable and eco-friendly campus environment through the implementation of various green initiatives. These efforts not only reduce the ecological footprint of the campus but also promote awareness and responsibility towards environmental conservation among students and staff.

Through these proactive measures, the institute aligns itself with several United Nations Sustainable Development Goals (SDGs), including:

- **SDG 6: Clean Water and Sanitation** – by promoting efficient water management systems, rainwater harvesting, and wastewater recycling.
- **SDG 7: Affordable and Clean Energy** – through the installation of solar panels and energy-efficient infrastructure to reduce dependency on non-renewable energy sources.
- **SDG 11: Sustainable Cities and Communities** – by creating green campus spaces, encouraging sustainable transportation, and integrating eco-conscious infrastructure planning.
- **SDG 12: Responsible Consumption and Production** – by encouraging waste segregation, recycling, and sustainable resource usage across campus operations.
- **SDG 13: Climate Action** – through initiatives aimed at reducing carbon emissions and enhancing climate resilience.

KKWIEER's commitment to these global goals underscores its vision of integrating sustainability into education and institutional practices, thereby preparing students to be responsible global citizens.

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Green Initiatives Undertaken by KKWIEER, Nashik

Solar Photovoltaic (PV) Plant

A 13 kWp rooftop Solar PV Plant has been installed on the B Wing of the Engineering building. The electricity generated from this installation is integrated directly into the Low Tension (LT) distribution panel of the B Wing, contributing to the reduction of conventional energy consumption and promoting renewable energy usage on campus.
The project was sponsored by Savitribai Phule Pune University, Pune in AY 2017-18.

Benefits of Solar PV Plant Generating 60 kWh/Day (Approx. 22,000 kWh/Year):
Significant Energy Offset: Helps reduce dependency on grid electricity by supplying a substantial portion of daily energy needs, particularly for educational campuses, offices, and residential complexes.
Annual Cost Savings: Generates approximate savings of ₹3.5 lakhs per year based on average electricity tariffs, reducing operational costs.
Return on Investment: These savings contribute to a quicker payback period for the initial solar infrastructure investment.
Eco-Friendly and Sustainable: Decreases carbon emissions and supports environmental goals by using clean, renewable energy.
Low Maintenance and Reliable: Solar PV systems require minimal upkeep and have long operational life spans, ensuring consistent performance.
Energy Cost Stability: Protects against future increases in electricity tariffs by generating your own power.
Promotes Green Campus Initiatives: Encourages sustainable practices and environmental responsibility among students and staff.

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Fully Automatic Bi-composting Machine

To effectively manage organic waste generated on campus, particularly from the kitchen and mess, a 1-phase, 1.5 kW Fully Automatic Bi-composting Machine is installed at the Boys' Mess. This machine has a processing capacity of 25 kg/day, enabling efficient and hygienic disposal of kitchen waste, which is converted into compost for use in gardening and landscaping activities within the campus.

Bi-composting Machine offers multiple environmental, economic, and operational benefits:

1. **Waste Reduction at Source**: It significantly reduces the volume of kitchen waste by converting it into compost on-site, minimizing the need for external waste disposal.
2. **Eco-friendly Campus**: By managing organic waste sustainably, the system supports a cleaner and greener campus environment.
3. **Compost Utilization**: The compost produced can be effectively used in campus gardening and landscaping, reducing the need for chemical fertilizers and enhancing soil health.
4. **Hygienic Waste Management**: Being fully automatic, the system ensures a clean and odor-free waste processing method, improving overall hygiene around the mess area.
5. **Energy Efficient**: Operating on a single-phase power supply with only 1.5 kW consumption, the machine is energy-efficient and cost-effective.
6. **Promotes Sustainability Awareness**: The presence of such a system encourages students and staff to adopt environmentally responsible practices and increases awareness about waste segregation and composting.
7. **Cost Savings Over Time**: Reducing waste collection and disposal costs, as well as lowering fertilizer purchase needs, results in long-term financial savings for the institution.

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LED Lighting System

In line with energy conservation goals, the institute has replaced conventional lighting fixtures with energy-efficient LED lighting across various parts of the campus:

- 18W LED Tubes**:** Installed in internal lighting areas, totaling 1500 Nos.
- 72W LED Street Lights**:** Deployed for campus street lighting with a count of 50 Nos.
- 18W LED Bulbs**:** Installed near the Guest House, with a total of 22 Nos.

This transition to LED lighting has significantly reduced the campus's electricity consumption.

Benefits of Replacing Conventional Fixtures with Energy-Efficient LED Lighting:

1. **Significant Energy Savings**: The use of 18W LED Tubes (1500 Nos.), 72W LED Street Lights (50 Nos.), and 18W LED Bulbs (22 Nos.) has led to a substantial reduction in electricity consumption across the campus.
2. **Lower Electricity Bills**: Reduced power usage directly translates into lower electricity costs, contributing to long-term operational savings for the institute.
3. **Longer Lifespan and Durability**: LEDs have a significantly longer life than conventional fixtures, reducing the frequency and cost of replacements and maintenance.
4. **Improved Lighting Quality**: LEDs provide better illumination with higher lumen output, enhancing visibility and safety in both indoor and outdoor areas.
5. **Eco-Friendly Operation**: LED lights consume less energy and produce lower carbon emissions, supporting the institute's sustainability and green campus initiatives.
6. **Instant On/Off Functionality**: Unlike conventional lights, LEDs do not require warm-up time, providing instant illumination and better energy control.
7. **Enhanced Aesthetics and Modern Appeal**: The use of LED lighting improves the overall look of the campus, creating a cleaner, brighter, and more modern environment.

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Rainwater Harvesting System

The institute has established a Rainwater Harvesting System, where all rainwater collected is channeled through an underground pipeline network to a well within the campus premises. This initiative supports groundwater recharge, thereby aiding in the conservation and sustainable management of water resources.

Benefits of the Rainwater Harvesting System:

1. **Groundwater Recharge**: Collected rainwater is directed to a well through underground pipelines, helping to replenish and sustain groundwater levels.
2. **Water Conservation**: Reduces dependency on external water sources by utilizing naturally available rainwater, promoting responsible water use.
3. **Sustainable Resource Management**: Supports long-term water sustainability on campus, especially during dry seasons or water scarcity periods.
4. **Reduction in Water Bills**: By supplementing the water supply with harvested rainwater, the institute lowers its reliance on municipal water, thereby reducing costs.
5. **Eco-Friendly Practice**: Aligns with environmental goals by preventing rainwater runoff, soil erosion, and surface water contamination.
6. **Educational Value**: Acts as a live demonstration for students and visitors on sustainable water management techniques and environmental responsibility.
7. **Compliance with Regulations**: Helps the institute meet environmental compliance standards and building codes related to water conservation.

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Solar Water Heating Systems

To minimize energy consumption for water heating, the campus has installed Solar Water Heaters at various hostel and guest house facilities:

- Boys' Hostel**:** 8 units of 1000 LPD (Liters Per Day) capacity
- Girls' Hostel**:** 5 units of 1000 LPD capacity
- Guest House**:** 2 units of 1000 LPD capacity

These installations ensure the availability of hot water through renewable energy sources, contributing to energy savings.

Benefits of Solar Water Heaters Installed on Campus:

1. **Reduced Electricity Consumption**: Solar Water Heaters eliminate or significantly reduce the need for electric geysers, leading to substantial energy savings.
2. **Utilization of Renewable Energy**: The system harnesses solar energy, a clean and renewable resource, ensuring an eco-friendly hot water supply.
3. **Cost Savings**: Reduced use of conventional electricity for water heating translates into lower utility bills over time.
4. **Reliable Hot Water Supply**: With 8 units in the Boys' Hostel, 5 in the Girls' Hostel, and 2 in the Guest House (all 1000 LPD capacity), hot water is consistently available to residents.
5. **Low Maintenance and Long Lifespan**: Solar water heaters have simple mechanisms and require minimal maintenance, making them cost-effective in the long run.
6. **Supports Green Campus Initiatives**: These installations demonstrate the institute's commitment to sustainability and responsible energy use.
7. **Reduction in Carbon Footprint**: By avoiding fossil fuel-based heating methods, the system helps lower greenhouse gas emissions.

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Green Belt Development

The institute has emphasized green belt development by planting **a** broad spectrum of tree species in and around the campus. This initiative not only enhances the aesthetic appeal of the environment but also supports biodiversity, improves air quality, and provides natural shading, contributing to a healthier campus atmosphere.

Through the implementation of these comprehensive green initiatives, KKWIEER, Nashik, has demonstrated its dedication to sustainability and environmental stewardship. By adopting renewable energy sources, efficient waste management systems, water conservation measures, energy-efficient lighting, and promoting green landscaping, the institute significantly contributes to reducing its environmental impact. These measures not only foster a sustainable campus but also serve as a practical model for students and the community, encouraging the adoption of eco-friendly practices in broader society.

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Benefits of Green Belt Development and Campus Sustainability Initiatives:

1. **Enhanced Air Quality**: Plantation of diverse tree species helps absorb pollutants and increase oxygen levels, contributing to a cleaner and healthier atmosphere.
2. **Support for Biodiversity**: The green belt provides a natural habitat for various birds, insects, and small fauna, enriching campus biodiversity.
3. **Improved Microclimate**: Trees and greenery help regulate temperature, provide natural shading, and reduce the urban heat island effect within the campus.
4. **Aesthetic and Recreational Value**: Lush green surroundings enhance the visual appeal of the campus and provide serene, shaded areas for students and staff to relax.
5. **Educational and Awareness Impact**: The visible implementation of sustainability practices serves as a live model, encouraging students and visitors to adopt eco-friendly habits.
6. **Reduction in Environmental Footprint**: Initiatives like renewable energy adoption, water and waste management, and green landscaping significantly reduce the campus's carbon footprint.
7. **Demonstration of Environmental Leadership**: Through comprehensive green practices, KKWIEER, Nashik, showcases its commitment to environmental stewardship, setting an example for other institutions and the broader community.

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Dome in Central Library

Incorporating a transparent dome in a library is an effective architectural strategy to harness natural daylight, reducing the reliance on artificial lighting during the day. The dome, typically made from glass or high-performance polycarbonate, allows sunlight to penetrate deep into the interior spaces, creating a bright and inviting reading environment. This natural illumination not only enhances visual comfort but also contributes to the well-being and productivity of library users. Strategically placing the dome at the central part of the building ensures even light distribution and minimizes glare. Such a design approach aligns with sustainable building practices and can significantly lower energy consumption. Moreover, a well-designed transparent dome can serve as a visual landmark and add aesthetic value to the library structure.

Benefits of Incorporating a Transparent Dome in the Library:

1. **Natural Daylight Utilization**: The dome allows ample sunlight into the library, reducing the need for artificial lighting during daytime hours.
2. **Energy Savings**: Lower reliance on electric lighting significantly reduces energy consumption and operational costs.
3. **Enhanced Visual Comfort**: Natural light creates a pleasant and well-lit reading environment, improving user comfort and reducing eye strain.
4. **Boosts Productivity and Well-being**: Exposure to daylight has been shown to enhance concentration, mood, and overall productivity among students and staff.
5. **Even Light Distribution**: Strategically placing the dome at the center ensures balanced lighting throughout the interior, minimizing glare and dark spots.
6. **Aesthetic and Architectural Appeal**: The dome adds a striking architectural feature, enhancing the building's visual identity and appeal.
7. **Supports Green Building Practices**: Incorporating natural lighting aligns with sustainable design principles and helps reduce the library's environmental footprint.