CHAPTER 12

Analysis of University Campus Performance in Compliance with IGBC (Green Campus) Rating System

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ABSTRACT

In 1987 the United Nations Brundtland Commission defined sustainability as "the ability to meet the needs of the present without compromising the ability of future generations to meet their needs." Over the past decade, sustainability science has emerged as a critical field that centers on assessing the intricate relationship between the natural environment and human society. This discipline emphasizes the ability of future generations to meet their needs. Academic campuses are microcosms of broader metropolitan ecosystems and hence are ideal locations to demonstrate the application of principles of sustainable development into reality. The Indian Green Building Council (IGBC) has served as a significant stakeholder in the drive for sustainable development by promoting green construction projects in the country. IGBC empowers the stakeholders from architects to construction professionals to further their understanding of sustainable construction practices by providing them with the necessary information and resources. This paper analyses University campus sustainability performance through the IGBC Green Rating Systems. Utilizing interviews, observations and other methods prescribed by IGBC for data collection an assessment of the existing building campus along eight important areas has been conducted. The results award a credit score of 44 which indicates a certified certification level. The paper concludes with a sequence of recommendations to target the shortfall of the campus in specific domains, which will empower the campus to reinforce its green credentials. By implementing these actionable steps, the university can serve as a role model for other institutions while enriching its environmental impact.

Keywords: Sustainability; Green Campus; Environmental Impact; Sustainable Performance; IGBC Green Rating.

1.0 Introduction

Construction has been accused of causing environmental problems ranging from excessive consumption of global resources both in terms of construction and building operation to the pollution of the surrounding environment. There is an intricate relationship that exists between society and nature, to address this complicated relationship sustainability has emerged as a critical field.

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Climate change, depletion of resources, loss of biodiversity, and environmental degredation are among the various environmental challenges faced by the society, and the educational institution will play a critical role in tackling these challenges.[1] The United Nations in 1987 published the Brundtland Report, which encompassed the definition of sustainability that has become one of the most preferred definition globally: “Sustainability is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” [7]This essential principle highlights the responsibility of institutions to not only provide an education to the current generation but also impress upon them the values, morals, and practices through which their work will be able to aid future generations.[2]Educational campuses are a representation of the vast societal landscape, they are uniquely stationed to be at the forefront of sustainability efforts. They have the potential to shape the upcoming sustainable practices that can affect the neighboring communities. By inculcating sustainability into the curriculum, operating strategies, and campus cultures, the institutions can popularize an ethos of environmental protection, encouraging the staff and students to embrace for responsible and sustainable behaviours. This will lead to the creation of ripples effect that will spread beyond the boundaries of the campus, modelling the aspirations of future innovators and leaders. [3]

The Green campus rating system has been formulated by the Indian Green Building Council (IGBC) to further the cause of sustainability in campuses. This rating system provides methodological process for evaluating the sustainability of campuses and encourage sustainable practices across various institutions throughout India.[6] This framework targets various fundamental areas that can result in meaningful reductions in the environmental impact of the institutions while enhancing the quality of life of the campus residents. The framework focuses on key areas such as water and electricity conservation, which are critical for reduction of the environmental footprint of the educational institutions. Institutions have considerable energy demands that are attributable to their operations and facilities, making efficiency a top priority.[4,5,6] Adopting water conservation practices, including but not limited to rainwater harvesting, wastewater recycling, and the use of efficient plumbing fixtures, is critical for fostering responsible water management.. Additionally, solar panels and wind turbines are among renewable energy sources, adoption of these renewable energy sources can significantly reduce the reliance of the institutions on fossil fuels and lower carbon emissions. Another important domain is waste management. [4,6]

A significant volume of waste is generated by educational institutes, thus to reduce the landfill share of the institutions an efficient waste management plan is required. Composting, waste segregation, recycling and other such initiatives can not only manage waste effectively but can also serve as a podium for creating awareness about the importance of sustainable waste practices among staff and students.[4,5] The improvement of health and well-being facilities is an indispensable part of the rating system. Both the physical and mental well-being of the occupants should be the focus of any campus area that is deemed to be sustainable. This can be

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achieved through initiatives such as advocacy of active transportation, ample green spaces, and providing access to healthy food options. Such programs result in an enriching educational experience, due to the collaborative and vibrant environment for learning.[4,6]

The study analyzes the University campus along the criteria set by IGBC Green Campus rating system that focuses on different dimensions of sustainability that exist within the environment of the campus. A rigorous evaluation of the campus practices, such as efficient waste disposal, energy efficient infrastructure and sustainable resource utilization will highlight the strengths of the campus that can be reproduced across different institutions throughout the nation. The study will also identify key areas for development and improvement, allowing an existing university campus to create an environment for continuous developments in the university's sustainability efforts. The actionable insights that will be revealed from the analysis will not only add to the ongoing dialogue around inculcating sustainable practices into education, but also empower other institutions to participate into the drive for a sustainable future by utilizing similar sustainability frameworks. Adoption of sustainability by more educational institutions will lead to substantial development in regard to tackling the global environmental challenges.

2.0 Objectives

- Assess the University's compliance with IGBC Green Campus Rating parameters.
- Identify areas where the campus lags in sustainability and provide guidelines to enhance sustainability and green features on campus.

3.0 Methodology

The methodology for this research involves a mixed methods approach to evaluate existing campus buildings for compliance with green building standards according to the Indian Green Building Council (IGBC) norms. (Figure 1) gives an overview of the methodology adopted to complete the research work.

3.1 Data collection

The first step of research begins with collection of data through surveys, site visits and document analysis for evaluating the university campus. In order to inspect the physical condition of the building and infrastructure, site visits are essential for examination purposes. Various parameters like water consumption, energy systems, ventilation quality and building materials used for construction can be closely evaluated. The surveys and questionnaires will help in collecting the basic information of students, faculties, administrative staffs and facility managers to give more insights about campus's sustainability practices and scope of improvement. The document analysis procedure will include a review of building blueprints,

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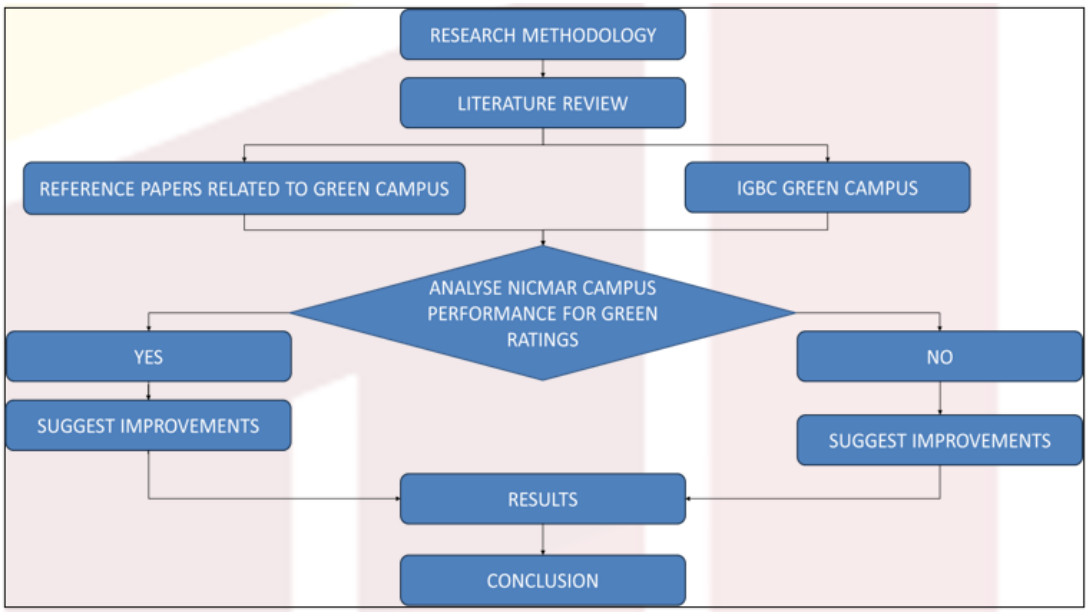
maintenance logs, and any existing green certifications. In particular, certification records will shed information on the facilities' past compliance with sustainability standards.

Figure 1: Methodology Chart



3.2 Data analysis

To understand the performance of campus's green building performance in a better way dual analysis using appropriate quantitative and qualitative methods are used. Quantitative data from surveys and observations during site visits were statistically processed. Qualitative data, such as responses document analysis was done to identify the recurring patterns and areas of concern.

3.3 Credit system

IGBC Green Campus rating system addresses green features under the following categories: Site Planning and Management Sustainable Transportation Water Conservation Energy Efficiency Material and Resource Management Health & Well-being Green Education Innovation in Design. The guidelines detailed under each mandatory requirement & credit enables the design and construction of campuses of all sizes and types (as defined in scope). Different levels of green campus certification (Table 1) are awarded based on the total credits earned. However, every green campus should meet certain mandatory requirements, which are non negotiable. As per the various categories and credit scoring mentioned in IGBC document, rating was provided.

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Table 1: Threshold Criteria for Certification Levels

Certification Level	New Campus	Existing Campus	Recognition
Certified	40-49	36-44	Best Practices
Silver	50-59	45-53	Outstanding Performance
Gold	60-74	54-66	National Excellence
Platinum	75-100	67-90	Global Leadership

4.0 Results and Discussion

IGBC Green Campus Rating System		Points Available	Scoring
Site Planning and Management			
SPM MR 1	Green Buildings within the Campus	Required	DNA
SPM MR 2	Soil Erosion Control	Required	DNA
SPM Credit 1	Green Buildings within the Campus	10	5
SPM Credit 2	Site Preservation	NA	NA
SPM Credit 3	Green Cover or Vegetation	6	6
SPM Credit 4	Heat Island Reduction, Non-roof	4	2
SPM Credit 5	Outdoor Light Pollution Reduction	2	NA
Sustainable transportation			
ST Credit 1	Pedestrian Network	3	3
ST Credit 2	Bicycle Lanes Network	4	4
ST Credit 3	Access to Sustainable Transportation	4	2
Water Conservation			
WC MR 1	Rainwater Harvesting	Required	Fulfilled
WC Credit 1	Rainwater Harvesting	6	-
WC Credit 2	Landscape Design	4	NA
WC Credit 3	Management of Irrigation Systems	2	1
WC Credit 4	Wastewater Treatment & Reuse	4	4
WC Credit 5	Optimise Water Use for Construction	1	DNA
WC Credit 6	Water Metering	2	2
Energy Efficiency			
EE Credit 1	Energy Efficiency in Infrastructural Equipment	10	2
EE Credit 2	On-site Renewable Energy	5	Nil
EE Credit 3	Off-site Renewable Energy	4	DNA
EE Credit 4	Energy Metering	2	2
Material and resource management			
MRM Mandatory Requirement 1	Segregation of Waste, Post-occupancy	Required	Fulfilled
MRM Credit 1	Organic Waste Management, Post-occupancy	3	2
Health & Well-being			
HWB MR 1	Tobacco Smoke Control	Required	Fulfilled
HWB Credit 1	Basic Amenities	1	1

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HWB Credit 2	Health & Well-being Facilities	4	4
HWB Credit 3	Universal Design	1	1
HWB Credit 4	Basic Facilities for Construction Workforce	NA	NA
Green Education			
GE Credit 1	Green Education	2	1
GE Credit 2	Green Campus Guidelines	2	1
Innovation in Design			
ID Credit 1	Innovation in Design Process	4	DNA
ID Credit 2	IGBC Accredited Professional	2	0
	Total		44

DNA- Data Not Available, NA – Not Applicable

The total performance of the campus results in scoring of 44 out of 90 potential points scoring "Certified" rating. The campus has attained all possible credits in the domain areas of "Health & Well-being" and "Green Education", signifying its flourishing sustainability practices. In other domain areas like "Material and Resource Management," while the campus has a composting initiative in place for the generated garden waste, it missed out on potential points for waste management policies for the food waste generated on the campus. The domains of "Energy Efficiency" and "Water Conservation" require special focus to adopt innovative sustainable approaches and deploy equipment that are efficient. Campus still has the potential to score additional credits which could not be awarded due to lack of data at the present time.

5.0 Conclusion

The evaluation of NICMAR University's sustainability performance using the IGBC Green Campus Rating System has given a thorough understanding of the university's current green initiatives as well as potential directions for development. The University has achieved 44 out of potential 90 points scoring 'Certified' rating level, acknowledging both its successful sustainable practices and the substantial room for development. While the campus has demonstrated excellence in areas like Green Education and Health & Well-Being, the report emphasizes that specific interventions are needed to improve sustainability in other crucial areas including energy efficiency, site design, and material resource management. The institution must prioritize energy efficiency through expanding solar photovoltaic installations and improving HVAC and lighting systems in order to improve the overall efficiency thus paving way for increase in sustainability performance. Rainwater-fed irrigation and smart irrigation with soil moisture sensors can contribute to water conservation. Waste management techniques including composting and biogas for Food waste produced, will lessen dependency on landfills. The heat island effect can also be minimized by site planning enhancements including pervious surfaces, shaded parking, and high-SRI materials. By implementing these measures, Nicmar University has the potential to improve its sustainability rating considerably and set an example

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for other academic institutions. The results highlight how crucial it is to continuously assess and modify the campus development in order to attain sustainability. By systematically implementing proposed strategies into practice, the university can strengthen its dedication to environmental stewardship and provide a benchmark for other educational establishments striving to create a more sustainable future. This research paper has provided valuable insights into the performance of IGBC Green Rating of University Campus, but due to lack of information and manpower, certain data was not collected which can be continued further by future prospects pursuing this topic. Future researchers can also explore the topic by comparing the current IGBC performance ratings with other International Green Rating systems like LEED, BREEAM, GRIHA, CSAF and STARS, and provide valuable comparison data and performance ratings with respect to these rating systems.

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