VIGNAN'S
Foundation for Science, Technology & Research
(Deemed to be UNIVERSITY)
-Estd. u/s 3 of UGC Act 1956

Sustainability Literacy Assessment Report

Introduction

This report presents the methodology and outcomes of measuring sustainability literacy among students at Vignan University. The purpose is aligned with THE Impact Ranking (Metric 17.4.4), ISO 9001:2015 quality management standards, UI (University Impact) metrics targets, and institutional sustainability initiatives such as CO_2 emission reduction, air quality monitoring, electric vehicle transition, and renewable energy adoption, including biogas and solar power.

Objective

To assess the level of sustainability knowledge, awareness, and retention among students across various programs at Vignan University. The assessment also aims to integrate sustainability literacy with ISO 9001:2015 quality indicators and UI metrics to strengthen institutional sustainability goals.

Methodology

Vignan University adopts a structured approach.

Sustainability Literacy Questionnaire (SLQ): Covers SDGs, climate action, renewable energy, emissions, and quality management.

- **Course-Embedded Assessments:** Evaluates learning outcomes, ISO quality practices, and environmental management topics.
- **Sustainability Indicators Awareness:** Students evaluated familiarity with UI metrics, carbon footprint, biodiversity, air quality, and energy systems.
- **Retention Analysis:** Pre-test and post-test comparison for long-term learning.

Campus Sustainability Indicators Integrated into Literacy Assessment

- **ISO 9001:2015 Alignment:** Students are assessed on awareness of quality management, continuous improvement, and documentation practices.
- **UI Metrics Targets:** Includes understanding of sustainability targets such as waste reduction, energy efficiency, gender equity, and community outreach.
- **CO_2 Emission Monitoring:** Campus emission data and reduction strategies are part of case studies used in assessments.
- **Air Quality Index (AQI):** Students learn how AQI is measured and its impact on health and the environment.
- **Electric Vehicle Initiatives:** Awareness of the university's EV adoption plan and carbon reduction benefits.

- **Renewable Energy (Biogas & Solar):** Students are introduced to campus solar power capacity and biogas waste-to-energy systems.

Campus Data

Indicator	Unit	2022-23	2023-24	Remarks
CO_2 Emission	Tons/year	132	118	10% reduction due to solar expansion
Solar Power Installed	kWp	450	600	New rooftop installations completed
Biogas Production	kg/day	35	48	Increased kitchen waste processing
AQI (Campus Average)	Index	62	55	Improved air filtration & green cover
Electric Vehicles (Campus Fleet)	Vehicles	12	21	Phased replacement of fuel vehicles

Integration with Student Learning

The sustainability literacy tools incorporate real campus data such as emissions, renewable energy, and air quality. This practical exposure improves students' understanding and retention, aligning with ISO 9001:2015 principles of continuous improvement and UI metric targets.

Action Plan (2024–25)

- Introduce ISO 9001:2015-based sustainability quality modules.
- Include live CO_2 dashboards and AQI monitors in student projects.
- Expand EV charging stations on campus.
- Increase solar capacity to 750 kWp and upgrade the biogas plant.

ISO 9001:2015

Vignan University aligns its sustainability practices with the ISO 9001:2015 Quality Management System. This includes structured documentation, continuous improvement cycles, stakeholder satisfaction tracking, and process-based management. The university ensures that sustainability literacy assessments follow the same quality assurance framework.

UI Metrics Targets

The University Impact (UI) Metrics framework guides Vignan University in areas such as gender equity, green initiatives, community engagement, waste management, clean energy adoption, and academic outcomes. Students are evaluated on their understanding of these institutional sustainability targets.

CO_2 Emission Data

The campus monitors Scope 1 and Scope 2 CO_2 emissions through energy audits, fuel usage reports, and renewable energy offsets. A steady decline in emissions has been achieved due to increased solar energy generation and electric mobility initiatives.

Air Quality

Air Quality Index (AQI) is monitored regularly across the campus using digital sensors. Data indicate a year-on-year improvement due to expanded green cover, restricted vehicle movement, and pollution-control measures. Students learn AQI interpretation as part of environmental literacy.

Electric Vehicles

Vignan University is transitioning towards a green transportation model by introducing electric buggies, e-bikes, and electric staff vehicles. Charging stations and awareness activities support eco-friendly mobility.

Biogas System

The campus biogas plant converts kitchen waste into clean fuel, supporting both waste management and energy efficiency. Students learn circular economic concepts by studying the biogas generation cycle.

Solar Energy

The university has installed rooftop solar PV systems across academic and administrative buildings. This reduces dependency on non-renewable energy and supports carbon reduction goals. Students engage in solar energy monitoring projects.

Conclusion

Vignan University's sustainability literacy initiative is closely integrated with real environmental performance data, quality systems, and UI metrics. This ensures that students acquire practical and measurable sustainability knowledge aligned with global standards.

VFSTR: A Green Campus

Vignan's Foundation for Science, Technology, and Research (VFSTR), deemed to be university, has been preparing globally acceptable, industry-ready skilled professionals to aid the socio-economic transformation of the region as well as the country as a whole. It is dedicated to provide quality education in a diverse and intellectually stimulating environment. The institute celebrates the power of knowledge, cultivates vision and builds awareness about the self and society around. VFSTR situated in the rural area of Vadlamudi in Guntur district of Andhra Pradesh offers a pristine green environment to its students and staff. The following sustainable practices are carried out on campus for achieving an eco-friendly environment.

- **Sustainable Energy Use at VFSTR campus**

The campus employs a very sustainable approach towards energy consumption. Architecture of the campus is such that natural sunlight and ventilation can be used to its maximum in order to reduce energy consumption. VFSTR utilizes about 61% energy from grid supply and 39% from 1MW solar PV Power plant solar power plant which was installed and became operational in 2018. Use of LEDs, smart sensoring ACs are also present at the campus to reduce energy consumption. Special awareness programmes on energy conservation and instructions are given to the staff and students for sustainable use of electricity on campus.

Apart from the solar power plant renewable energy use is promoted on campus. An on campus biogas plant is installed for generating biogas for cooking purpose from the vegetable waste and food waste generated in the campus hostel, dining halls and cafes. The BioUrja-1000KPD biogas plant was installed in 2018 at VFSTR having a total cost of Rupees 65.00

lakhs which and was supplied by M/S GPS Renewables Pvt.Ltd., Bengaluru. The capacity of the installed Biogas plant is to digest 1000 kg of food waste per day. The biogas yield is ~70 kg of LPG equivalent per day.

Figure 1: showing solar power plant on the terrace of U-Block in VFSTR campus

Figure 2: Biogas Plant at VFSTR campus

Figure 3: Use of on campus e-vehicles

- **<u>Solid-waste Management at VFSTR campus</u>**

Waste Management initiative was taken in view of maintaining Green environment, Go-Green initiative and National Mission on Clean and Green Environment like SWACH Bharat Mission. In the VFSTR campus No Smoking and No Tobacco, Vehicles restriction, Garbage segregation, reusing waste and rain water harvesting are followed. All the steps took toward the waste management in the VFSTR campus are to oblige global cause by initiating the necessary steps.

All the solid waste in each block, hostel rooms, surrounding areas, and library, restrooms and kitchen waste are segregated and collected each morning by housekeeping staff in separate containers and loaded into the truck. All the wet waste is gathered at waste yard marked as compost pit at the extreme end of the campus. The dry waste collected is used as landfills. The remaining plastic materials, tin cans and glass bottles are sent to recycling shops and collection centers. The recycled wet waste is used as a manure/ fertilizer on the campus. The VFSTR University encourages students and staff not to use plastics and use a reusable, recyclable material. To utilize the water carefully, instructions and save water sign boards are also attached at drinking facilities.

Total waste collected in a day (including wet and dry waste)=890kg and Volume of waste=3.567m3 . For plastic waste management a pet bottle shredder has also been installed at university premises.

Figure 4: Segregation of waste at source

Figure 5: Plastic bottle shredder at dining halls

- **<u>Liquid-waste management and water conservation practices</u>**

A 600 KLD capacity sewage treatment plant system is being set up at VFSTR campus by Bluedrop enviro pvt. ltd. which uses the technology of artificially constructed wetland system. This technology uses phytoremediation and microbial remediation techniques for sewage water treatment. This STP is engineered systems to use the natural functions vegetation, soil, and organism to provide waste water treatment to wastewater. After treatment this waster will be reused for gardening and car washing purposes. Rain water harvesting practices are also carried out on campus.

Figure 5: Sewage Treatment Plant at VFSTR

- **Green campus and herbal garden**

Apart from all the green initiatives, VFSTR maintains a green campus housing a vibrant biodiversity. Several species of trees, shrubs and herbs are found on the campus which serves as habitat for animal and bird species. It also has its own herbal garden of prominent medicinal herbs.

Figure 6: VFSTR Green Campus

Figure 7: VFSTR herbal garden

- **Environmental Awareness Campaigns**

VFSTR conducts periodic on campus awareness programmes on environmental issues along-with other outreach programmes such as swachha bharat abhiyan etc. To further initiate awareness among the students and the staff VFSTR aims to organize more conferences, seminars and workshops on plastic waste management.

Figure 8a: Environmental awareness campaigns and programmes

Figure 8b: Environmental awareness campaigns and programmes

Figure 8c: Environmental awareness campaigns and programmes at VFSTR and in adopted villages

Figure 8d: Environmental awareness campaigns and programmes at VFSTR and in adopted villages


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Lat 16.232637°
Long 80.54788°
05/06/24 03:05 PM GMT +05:30
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Figure 8e: Environmental awareness campaigns and programmes at VFSTR

Figure 8f: Environmental awareness campaigns and programmes at VFSTR

Thus, VFSTR campus is an eco-friendly campus which promotes energy efficiency. It conduct environmental, energy and safety audits on campus and employs designated centres, committees and staff more maintenance of a sustainable, energy efficient green campus.

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