



Sustainability & Climate Action Report

***Reaching Carbon-neutrality
by 2050***



KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY (KIIT)

Deemed to be University U/S 3 of UGC Act, 1956

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1. Executive Summary

In this report, we present KIIT University's Sustainability/Climate Action Policy, which outlines our commitment to addressing climate change and fostering sustainability within our institution. The policy encompasses various areas, including environmental stewardship, energy efficiency, sustainable transportation, education and awareness, collaboration and partnerships, monitoring and reporting, and the goal of reaching carbon neutrality by 2050. By implementing this policy, we aim to reduce our environmental impact, conserve resources, and inspire positive change within our community and beyond.

2. Problem Statement: The Necessity of Climate Action

Climate change poses a real and urgent challenge, impacting KIIT University and Bhubaneswar, Odisha, India. With rising temperatures, sea-level rise, and intensified extreme weather events, climate action is imperative to mitigate adverse effects and build resilience. Bhubaneswar has experienced a temperature increase twice the global average, leading to challenges like heatwaves and reduced agricultural productivity. Coastal vulnerability due to sea-level rise threatens livelihoods and infrastructure. Intensified extreme weather events have caused flooding and damage.

To address these issues, KIIT University commits to reducing emissions, fostering research, education, and community engagement, and prioritizing resilience and adaptation strategies. Through sustainable practices and collaboration, we aim to inspire positive change and contribute to a more sustainable and resilient future for all.

3. KIIT Research on Climate Sustainability

At KIIT University, we are deeply committed to advancing research in the field of climate sustainability to tackle the pressing challenges posed by climate change. Our thrust area of research on climate sustainability encompasses a wide range of interdisciplinary studies aimed at understanding the complex dynamics of climate systems and identifying

innovative solutions for a greener and more sustainable future. Through cutting-edge research initiatives, we explore topics such as climate modeling, renewable energy technologies, sustainable urban planning, biodiversity conservation, and climate policy analysis. Our goal is to generate knowledge that empowers policymakers, industries, and communities to make informed decisions and implement effective climate mitigation and adaptation strategies. By fostering collaboration among our talented researchers and partnering with global institutions, we strive to make significant contributions towards a climate-resilient and environmentally conscious world.

Research contributions towards Climate Sustainability: KIIT University's research contributions towards climate sustainability have been pivotal in advancing knowledge and finding innovative solutions to address pressing environmental challenges. From cutting-edge climate modeling to pioneering renewable energy technologies, our research endeavors are making significant strides towards building a more resilient and sustainable future for the planet.

Major thrust areas of research on Climate Sustainability:

- | | |
|---|--|
| ✧ Thin films and Solar Cells | ✧ Renewable Energy |
| ✧ Energy storage | ✧ Power Quality |
| ✧ Water Science and Technology | ✧ Smart Grid |
| ✧ Waste Management | ✧ Functional & Energy Materials |
| ✧ Environmental biotechnology | ✧ Sustainable Energy Systems |
| ✧ Food Technology and Bio-process engineering | ✧ Corporate Social Responsibility |
| ✧ Waste Resource Engineering | ✧ Climate Change and Agriculture |
| ✧ Environmental Engineering | ✧ Biodiversity, natural resource management and rural livelihood |
| ✧ AI/MI for environment | |
| ✧ Data Analysis | |
| ✧ Geo-informatics | |
| ✧ Electric and Hybrid Vehicles | ✧ Sustainability in agriculture |

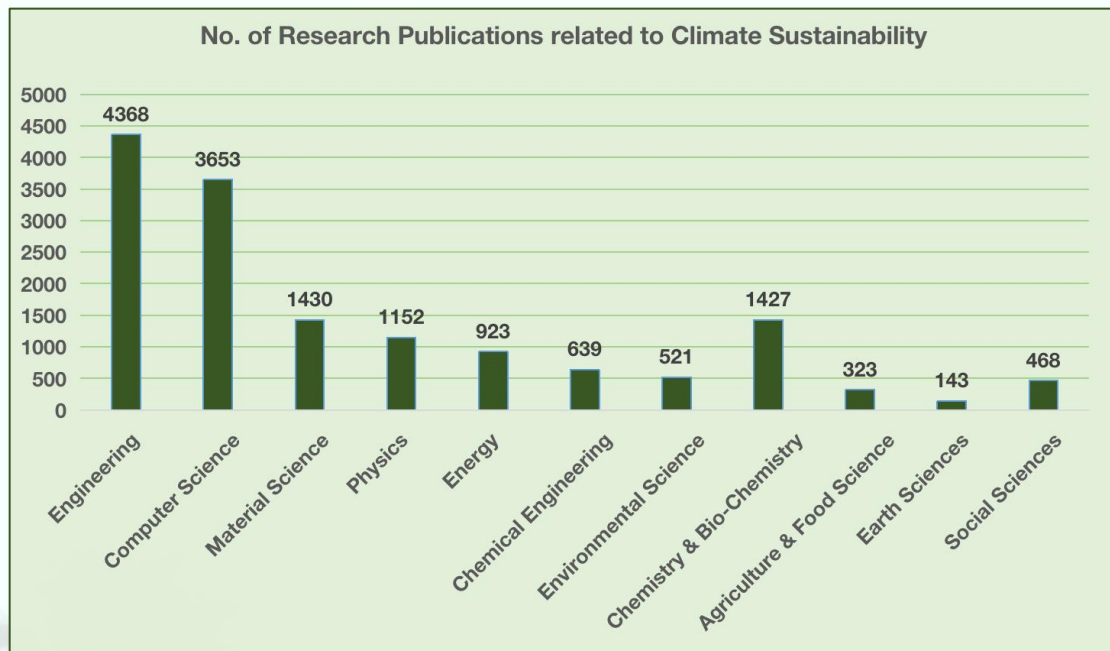


Figure 1. Research outcomes in various subjects related to climate sustainability.

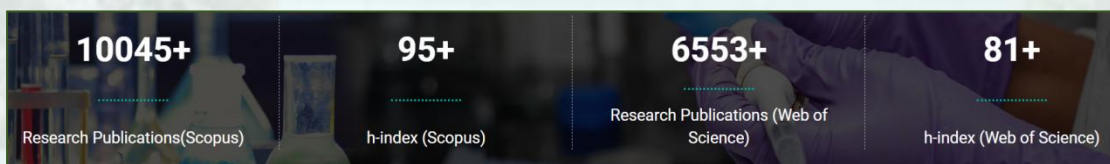


Figure 2. Research publications indexed in Scopus and WoS.

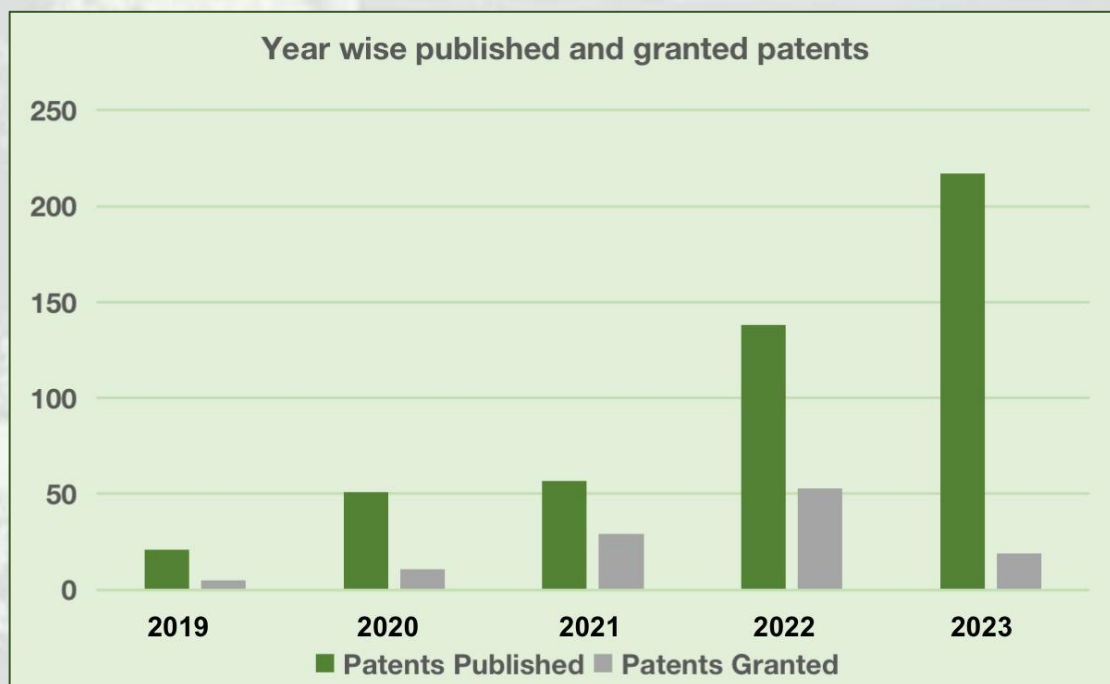


Figure 3. Year wise published and granted patents.

Research projects (on-going) towards Climate Sustainability: KIIT University is at the forefront of sustainability research, undertaking diverse projects aimed at addressing environmental challenges and promoting sustainable practices. From renewable energy advancements to climate resilience strategies, our research endeavors are making significant contributions to a more sustainable and eco-friendly future.

Sl. No.	Name of Project	Funding/Collaborating agency
1	Fabrication of Automated Mobile Biomedical Plastic Waste Recycling Facility for development of reusable products	DBT-BIRAC-BIG
2	Novel AI nanostructure based electrodes for batteries and super capacitor devices	DST-MM-NT
3	Anthropogenic and Geogenic contamination of ground water in Bhubaneswar urban catchment -A systematic Investigation.	ICSSR, MHRD
4	Design, Optimisation, & Demonstration of Chemical Column & Pressure Injection Treatment to Enhance the Shear Strength Characteristics along with Phytoremediation of the Abandoned Ash Pond	DST SERB
5	Analysis and Design of AC-DC bidirectional converter for EV wired charging SiC MOSFETs-DST	SERB
6	Development of cost-effective energy management strategies for a green hydrogen based electric vehicle charging station.	DST-SERB
7	Development of GaN-FET Based high efficiency Bidirectional DC-DC Converter with zero input current ripple for PV application	DST-SERB
8	Social Trust Servqual Model, and Service Consumption : A Covid19 Study"	ICSSR (Impress)
9	Sustainable Nitrogen Management in SAARC Countries	Global Challenge Research Fund (GCRF) of United Kingdom Research Innovation (UKRI)
10	Promotion of Regenerative Agriculture Initiatives at Mangalajodi, Odisha	Indian Grameen Services, Kolkata
11	Anthropogenic and Geogenic Contamination of Ground water in Bhubaneswar Urban Catchment	ICSSR
12	Forest Fire in Ghumsar North Division, Bhanjanagar: Issues and Way Forward	Forest Department (DFO), Bhanjanagar, Government of Odisha
13	Scoping Review of Solid fuel users' perceptions of household solid fuel use in South Asia Countries.	Multiple collaborators
14	Grey Water Sample Testing for Dhenkanal and Jatni Municipality	Housing & Urban Development Ltd.
15	Water Management during construction of Residential project at Satyanagar, Bhubaneswar	Dasarathi Naik and Engineers Pvt., Bhubaneswar
16	Classification of rock and utilisation	Rites Ltd., New Delhi
17	Traffic safety and management report for Gadakana, Bhubaneswar	DN Homes Pvt. Ltd., Bhubaneswar
18	Energy Audit and Optimization Consultancy	SOUL Ltd., Bhubaneswar

Table 1. Various major on-going funded/collaborated projects on Sustainability.

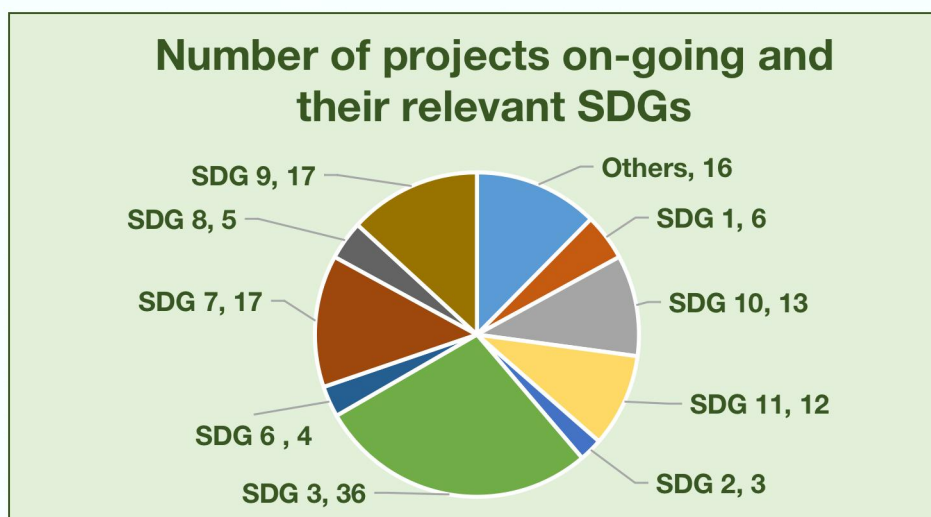


Figure 4. Number of on-going research projects with respect to their primary SDGs.

SDG	Goal	Areas of Projects	Funded by
SDG 1	No Poverty	Technical skill development, HR skill development	Ministry of Rural Development (Govt of India), Vedanta Limited, Handicraft & Handloom export promotional council of India
SDG 2	Zero Hunger	Baseline survey for promotion of Agriculture Production, Vitamin bio-fortification	Directorate of Horticulture Govt. of Odisha, Department of Science and Technology (DST)
SDG 3	Good Health and Well-Being	Wellness of Tribal Children, Women Health, Remote Health, Development of Diagnostics Platforms, Clinical Assessment of Cancer, Diagnosis of pneumonia in children	DST, ICSSR, ITRA, DBT, MSME, ICMR
SDG 4	Quality Education	Mentoring regional higher education institutes for quality education and accreditation, Implementation of ISO 27001:2013	UGC, DRDO
SDG 5	Gender Equality	Women's sanitary health, Women Empowerment	ICSSR, DST
SDG 6	Clean Health and Sanitation	Women's sanitary health, Faecal Sludge and Septage Management, Study of Sanitation and Social Change in Rural Odisha	ICSSR, Ernst & Young LLP
SDG 7	Affordable and Green Energy	Development of thin film solar cells, Research on Battery, Research on Grid connected renewable system, Micro Grid, Solar Based Electric Vehicle	DST, MNRE
SDG 8	Decent Work and Economic Growth	Impact of Dynamic Capability of Entrepreneurs, Assessment of Government Sponsored Social Programmes, Policing a Smart City, Socio-Economic study	ICSSR

SDG	Goal	Areas of Projects	Funded by
SDG 9	Industry Innovation and Infrastructure	Research projects on IOT, Nanocomposites, Machining Technology, thin film solar cell, batteries & super capacitor devices, High Voltage AC and High Voltage DC Transmission Lines Thermal Screening Door with Face Recognition	DST, AICTE, DRDO
SDG 10	Reduced Inequalities	Impact of Asha Workers in Combating Covid 19, Empowerment among the Tribal Woman, Revitalization of Indigenous Languages, Solution Maoist Extremism, Developing and Implementing an Effective Alcohol Policy in India.	ICSSR
SDG 11	Sustainability Cities and Communities	Policing a Smart City, Social determiners of water Inequity, Natural Disaster and Vulnerability study, Assessment of Central and State Water Laws, ICTs in Urban Policing	ICSSR
SDG 12	Responsible Consumption and Production	Waste Water Management, Enhancing the shelf-life of food products, Vitamin Bio-fortification	Karolinska Foreign Project, DST,
SDG 13	Climate Action	Climate Change Effects on Livelihoods, Natural Disaster and Vulnerability, Ground water Sources, Renewable energy,	ICSSR, DST, BRNS, DAE
SDG 14	Life Below Water	Littoral Microbial Flora of Chilika Lake,	ICZMP
SDG 15	Life on Land	Enhancing life of food products	DST
SDG 16	Peace Justice and Strong Institution	The Root Cause of Maoist Extremism and Development, Societal Roles in Developing and Implementing an Effective Alcohol Policy	ICSSR
SDG 17	Partnerships for the Goals	UKRI GCRF South Asian Nitrogen Hub Project, Social Innovation for Local Indian and Israeli Communities and Graduate Entrepreneurs, Food Security of Indian and South African Young Children	UK Research & Innovation, Interdisciplinary Center Herzliya (IDC, Israel), DST

Table 2. Summary on major projects on various SDGs.

Research Facility Development towards climate sustainability: As the world faces the increasingly urgent challenges posed by climate change, biodiversity loss, and environmental degradation, the importance of prioritizing environmental sustainability has never been clearer. KIIT Deemed to be University recognizes this critical need and has taken the

initiative to conduct research in the field of environmental sustainability. The university has established several research laboratories and centers that are dedicated to addressing these pressing issues.

- ✧ ***Electric & Hybrid Vehicle Research Centre:*** This research center focuses on advancing the development and adoption of electric and hybrid vehicles, which can significantly reduce carbon emissions and contribute to a cleaner environment.
- ✧ ***Green Engine Technology Centre:*** The Green Engine Technology Centre works towards designing and developing environmentally friendly and fuel-efficient engines that can help mitigate air pollution and conserve natural resources.
- ✧ ***Thin Film Photovoltaic Lab:*** This laboratory is committed to researching and improving thin film photovoltaic technology, a renewable energy source that harnesses sunlight to generate electricity without depleting finite resources.
- ✧ ***Environmental Engineering Laboratory:*** This laboratory is dedicated to studying and devising solutions to environmental challenges, including water and air pollution, waste management, and sustainable infrastructure.
- ✧ ***KIIT-DU Central Advanced Research Centre:*** This central research center may oversee interdisciplinary research efforts related to environmental sustainability and other critical fields.

Additionally, the university is actively working on the development of various Centers of Excellence that aim to become leaders in specific areas of research and innovation related to environmental sustainability:

- ✧ ***NI Centre of Excellence:*** Focused on a particular field of study (exact subject not mentioned).
- ✧ ***Centre of Excellence for Water:*** Concentrating on water-related research and solutions for sustainable water management.
- ✧ ***Centre of Excellence for Rare Earth Materials:*** Dedicated to the study and utilization of rare earth materials, which are essential for various eco-friendly technologies.

- ✧ ***Schneider Lab:*** A lab focused on research and development in collaboration with Schneider Electric, a company that specializes in energy management and automation.
- ✧ ***TBI-NIDHI Centre of Excellence:*** Focused on technology business incubation, fostering startups that work on environmental sustainability innovations.
- ✧ ***Siemens Laboratory:*** A lab in collaboration with Siemens, likely working on sustainable technologies and solutions.
- ✧ ***Interdisciplinary Research Centre in Materials and Nano-Sciences:*** This center may work on environmentally friendly materials and nanotechnology applications.
- ✧ ***Interdisciplinary Center of Energy with special reference to Renewable Energy:*** Concentrating on research related to renewable energy sources.
- ✧ ***IoT Centre of Excellence:*** Focused on developing applications of the Internet of Things (IoT) for sustainable practices and environmental monitoring.
- ✧ ***Centre of Excellence for Sustainability and Equity:*** Focused on promoting sustainability while ensuring social equity and justice.

These initiatives collectively demonstrate KIIT Deemed to be University's commitment to conducting vital research in environmental sustainability and contributing to the global effort to address the environmental challenges facing the planet. Through these dedicated research centers and labs, the university aims to foster innovation, find sustainable solutions, and play a significant role in creating a more environmentally conscious and resilient world.

KIIT-Technology Business Incubator (KIIT-TBI): The KIIT Technology Business Incubator (KIIT-TBI) is a non-profit Section (8) incubator established in 2009, supported by prestigious government bodies like NSTEDB, DST, MeitY, MSME, BIRAC, and TDB. As a recipient of the National Award for TBI in 2017, it serves as a vital initiative of KIIT Deemed to be University, Bhubaneswar, aimed at fostering the entrepreneurial ecosystem in the country. Recognized as a Centre of Excellence in Incubation by DST, Govt of India, KIIT-TBI offers an extensive platform and world-class infrastructure of

approximately 130,000 sq. ft. to nurture startups. It provides a wide array of incubation facilities and services, enabling aspiring entrepreneurs to transform their innovative ideas into commercially viable products. With a successful track record, having incubated and mentored 350+ startups, KIIT-TBI focuses on various domains, including IT and Engineering, Cleantech, Healthcare and Life Sciences, Biotechnology, Agri and Food Tech, and other social innovation areas, contributing to climate sustainability and addressing crucial societal challenges.

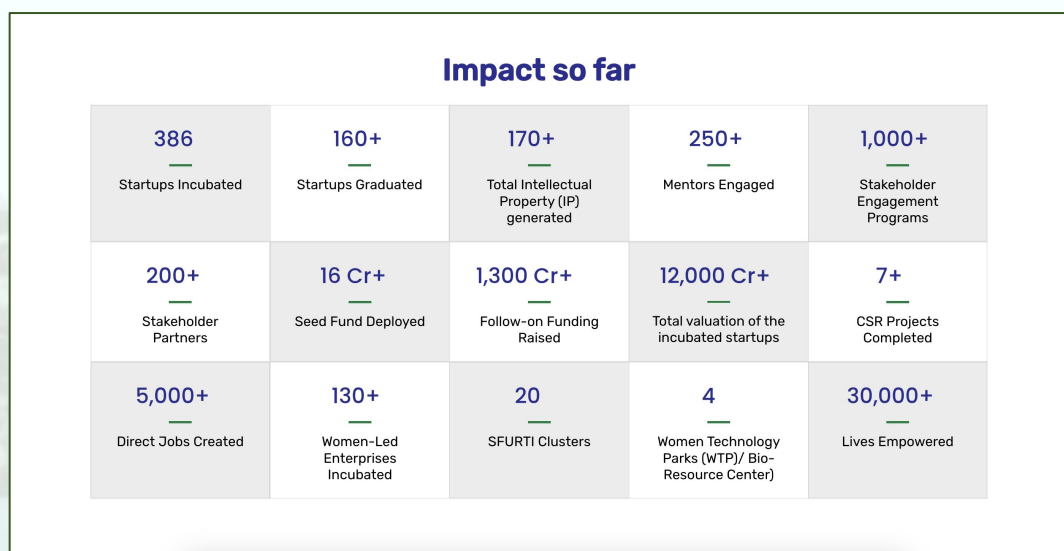


Figure 5. Impact of KIIT TBI.

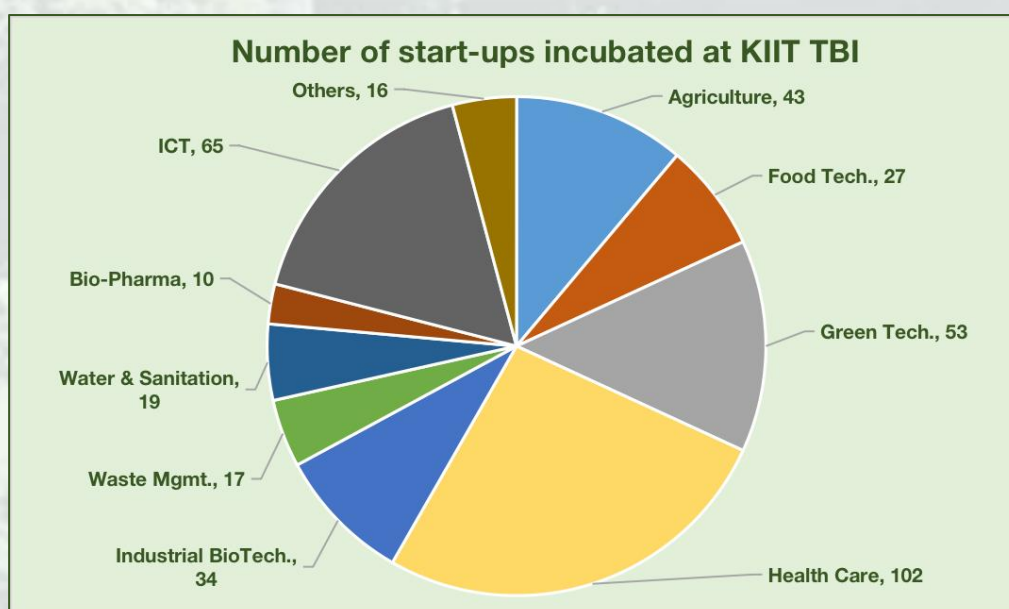


Figure 6. Number of start-ups incubated at KIIT TBI till date in various domains related to sustainability.

Study of microbial communities in the Chilika Lagoon: The Chilika Development Authority (CDA) has initiated a series of long-term research studies sponsored by the World Bank under the Integrated Coastal Zone Management project, with a focus on protecting lake genetic diversity and promoting sustainable use of bio-resources. One of these studies is dedicated to the examination of microbial communities and bio-prospecting within the Chilika Lagoon.

Collaborating with the KIIT School of Biotechnology, CDA has adopted a systematic approach to culture and characterize bacteria from various sectors of the lake. The study also involves documenting and conserving bacterial resources, studying the spatial and temporal dynamics of bacterial communities in relation to nutrient cycling, and isolating novel bacteria and enzymes with potential applications in biotechnology industries. Additionally, the research includes monitoring pollution and fecal indicator bacteria to better understand the lake's ecological health and support effective conservation efforts.

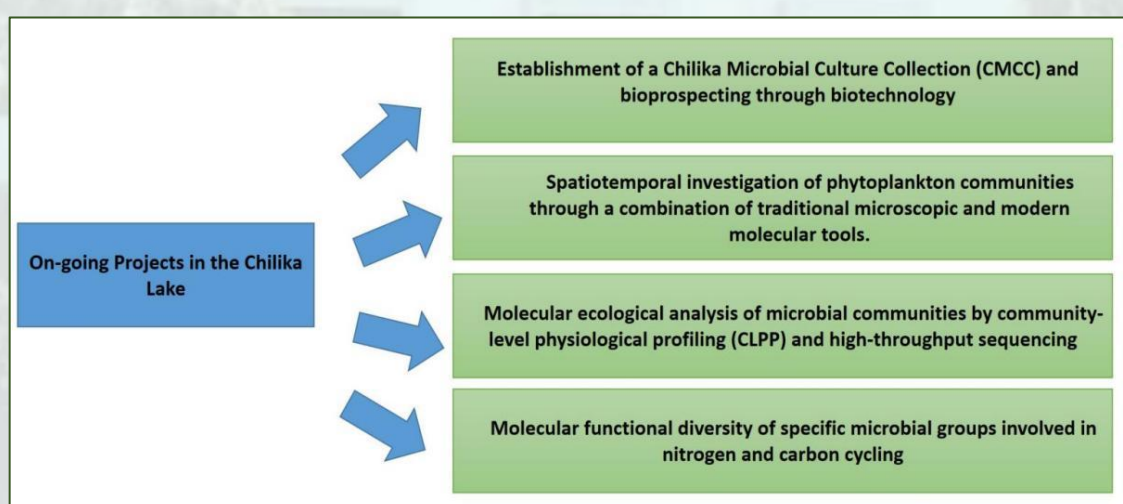


Figure 7. Study of microbial communities in the Chilika Lagoon in collaboration with KIIT Biotechnology School.

Global partnerships: In its pursuit of sustainability, KIIT has fostered strong academic partnerships and collaborations with over 441 world-class National and International Universities/Research labs worldwide. These partnerships play a crucial role in promoting sustainable practices and knowledge sharing.

The initiatives encompass a range of opportunities, including student, faculty, and research scholar exchange programs, internships for undergraduate and postgraduate students, active participation in research

and development endeavors, short-term courses designed for faculty and students to enhance their expertise in sustainability-related fields, occupational training focused on sustainable practices, exchange of publications and valuable information, as well as the organization of seminars and conferences to promote dialogue on sustainability topics.

As a result of these initiatives, KIIT students regularly have the chance to study at various partner universities, while KIIT also hosts exchange students from these esteemed institutions, encouraging a diverse and global perspective on sustainability efforts.

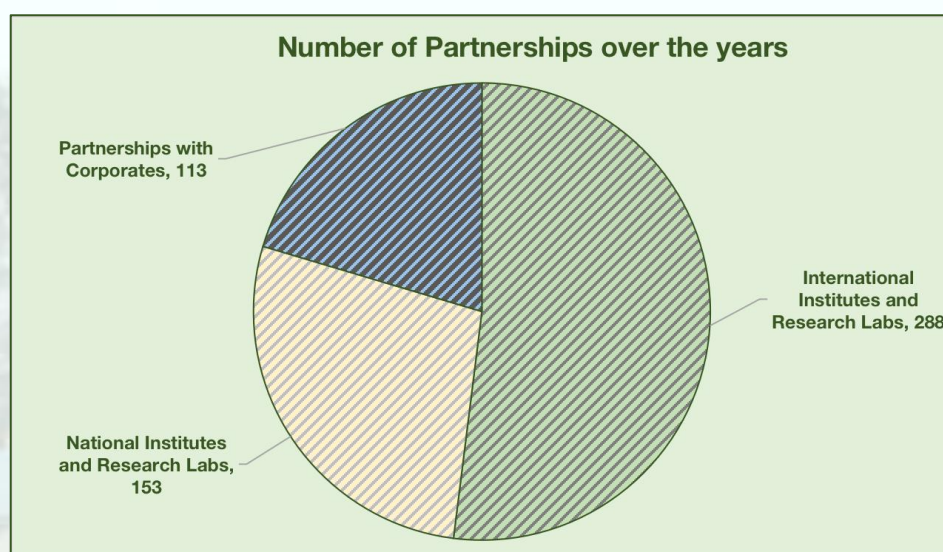


Figure 8. Number of partnerships KIIT has with Industries, National and International Institutes/Research Labs.

KIIT actively engages in partnerships with prestigious national and international organizations, including the European Association of International Education (EAIE), International Association of Universities (IAU), Association of Indian Universities (AIU), Association of Commonwealth Universities (ACU), University Mobility in Asia and the Pacific (UMAP), Academic Affiliate of the IET, UK, Academic Affiliate of ABET, USA, International Association of University Presidents (IAUP), Association of University of Asia Pacific (AUAP), International Institute of Education (IIE), New York, United Nations Academic Impact (UNAI), Eurasian Silk Road Universities Consortium (ESRUC) in Turkey, and the Talloires Network of Engaged Universities. These partnerships reflect KIIT's commitment to collaborative efforts towards sustainability and the global pursuit of academic excellence, fostering meaningful exchanges, research collaborations, and collective action to address pressing challenges for a more sustainable future.

4. Environmental Stewardship

4.1 Carbon Footprint Reduction:

Reducing our carbon footprint is a primary objective for us. Since 2015, we have been regularly measuring and monitoring our CO₂ emissions. Over the years, we have increased our renewable power generation and decreased our dependency on the grid. We have also integrated energy efficient electrical systems, substituted the conventional vehicles by electric vehicles and certified zero-emission vehicles, conducted mega plantation drives in and around the campus and introduced various environmental awareness programs and courses on sustainability and climate action. This has resulted in reduction of carbon footprint of our University.

We will set ambitious targets for greenhouse gas emissions reduction, aligned with scientific recommendations, and develop strategies to achieve them. Our goal is to reach carbon neutrality by 2050. We will invest in more renewable energy sources, energy-efficient technologies, and sustainable transportation options to minimize our carbon emissions. We will regularly assess and adjust our strategies to ensure progress towards our targets.

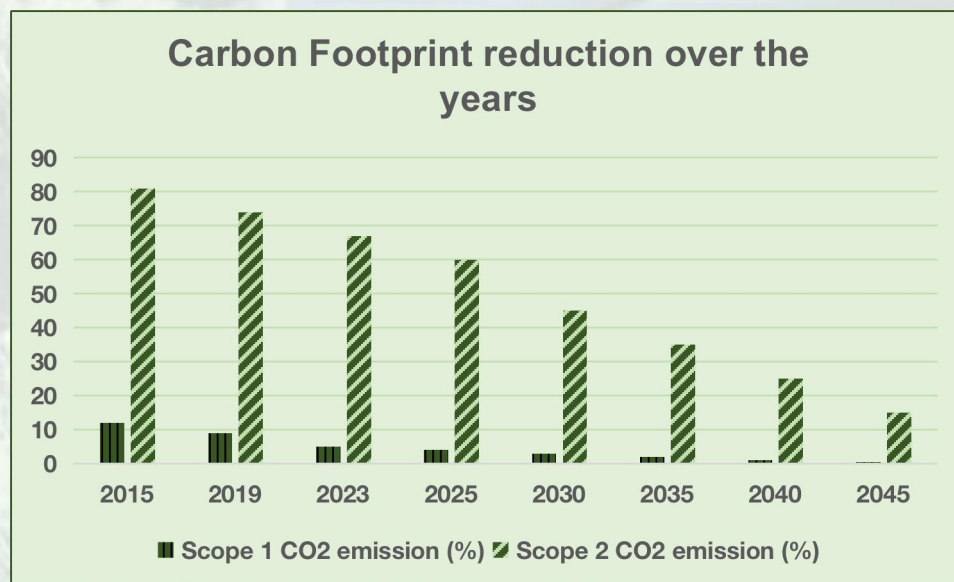


Figure 9. Evolution and projection of Carbon footprint of KIIT University over the years.

4.2 Waste Management:

We recognize the importance of responsible waste management practices. We have implemented comprehensive waste management systems, including recycling, composting, and proper disposal of hazardous materials. Our focus is on waste reduction, promoting a circular economy, and encouraging reuse and recycling initiatives. We explore innovative waste management technologies and collaborate with waste management experts to optimize our waste management practices.

The University already has 4x500 kg/day capacity Bio-gas plant installed which converts organic waste into 600 cu.cm of bio-gas per day, which is used for cooking and heating purposes at the hostels. Our plan is to double our capacity by 2030.



Figure 10. Organic waste based Bio-gas generation plants placed at the campus.

4.3 Water Conservation:

Water is a precious resource, and we are committed to its conservation. We have implemented efficient water management systems across our institution, raised awareness about water conservation among our community, and explored innovative water-saving technologies. We strive to minimize water usage and ensure sustainable water practices. We have also invested in rainwater harvesting systems and promoted water-saving initiatives throughout our campus. We have also implemented automated water flow control systems in overhead water reservoirs to prevent water overflow.



Figure 11. Liquid waste treatment plants.

Additionally, each campus and block has a successful liquid waste treatment process. To reduce water waste, liquid trash from campuses or buildings that employ liquid chemicals is collected separately as organic and inorganic wastes and handled accordingly. The Institute has an adequate sewage system that allows for the collection and treatment of waste water. Every month, the sewage system is checked to make sure no waste water is building up unintentionally. The cleaned water is used for plantation irrigation, gardening, and groundwater recharge.

KIIT has established Water Knowledge Centers in the University and also in different parts of the state. Furthermore, the University has established one Centre of Excellence for Water Conservation since 2009 and the faculties are working in the following areas: Hydro-Environment, Groundwater Hydrology, Ports and Coastal Engineering, Water Management and Hydro Informatics, River Hydraulics, Water and Waste Water, Geo-spatial techniques, Soft Computing Techniques, Modeling Techniques etc.

4.4 Biodiversity and Natural Habitat Protection:

Preserving and enhancing biodiversity is crucial for a sustainable future. We protect and restore natural habitats within our campus, promote sustainable land management practices, and integrate biodiversity considerations into our planning and development processes. We also engage our community in conservation efforts and support local

biodiversity initiatives. Our goal is to enhance biodiversity and ensure the long-term sustainability of ecosystems within and around our campus.



Figure 12. Various plantation drives held in and around KIIT.

KIIT Green is a bold initiative of KIIT University to control environmental pollution and to create a healthy ambience in and around 25 sq. km. area in which different campuses of KIIT are located. Over the span of 3 years, more than 100,000 saplings were planted in and around the campus. KIIT Green envisaged and implemented various pollution control plans in the campus. The University had taken up the ambitious plan of making the campus totally vehicle free. In the first phase, use of bikes, both by students and staffs, has been prohibited after putting in place an effective alternative transport arrangement. Besides mass plantation and limiting vehicular pollution, other environmentally friendly initiatives under KIIT Green included setting up new rain water harvesting and water management systems, sewerage treatment systems, biogas plants, solar water heating systems, etc in the campus.

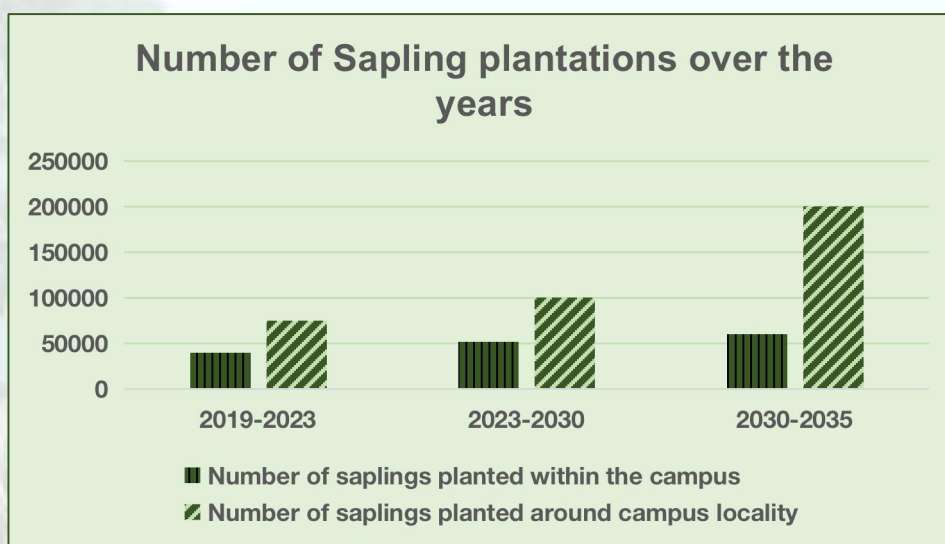


Figure 13. Number of saplings planted over the years along with projected numbers for the future.





Figure 14. KIIT Green Campus.

5. Energy Efficiency and Renewable Energy

5.1 Energy Efficiency:

Energy efficiency is a key component of our sustainability strategy. We conduct regular energy audits to identify areas of improvement, implement energy-saving technologies, and educate our staff and students about energy-conscious behavior. By optimizing energy consumption across all areas of our institution, we minimize our energy footprint and reduce greenhouse gas emissions.

The use of energy-efficient light sources, the use of capacitor banks to improve overall power factor and reduce electricity waste, the replacement of conventional motors with modern, high efficiency motors, the upgrading and routine maintenance of air conditioning systems for low power consumption, and the implementation of IoT-based smart lighting systems are major initiatives. The State Government of Odisha has recognized KIIT University in the category "Educational Institute - Best Performance in the field of Energy Saving and Conservation" in the year 2022. KIIT DU Bagged Odisha State Energy Conservation Award (OSECA) 2023 under the category of Educational Institute and the Odisha State Energy Conservation Award 2024 as the "Top Performer" in the Educational Institute category for its outstanding contributions to energy saving and conservation on National Energy Conservation Day, recognizing its commitment to energy efficiency and sustainability. The University has committed to enhance its current energy saving and conservation projects in the upcoming years.



Figure 15. KIIT received the Best Performance Award (Educational Institute) at the Odisha State Energy Conservation Awards - 2024.

5.2 Renewable Energy

We are committed to increasing our use of renewable energy sources. We explored opportunities to install on-site renewable energy systems, such as solar panels or wind turbines, and actively seek partnerships with local renewable energy providers. Our goal is to make a transition to a sustainable energy mix and reduce dependence on fossil fuels. By increasing the share of renewable energy in our energy supply, we will contribute to our goal of reaching carbon neutrality by 2050. In the last 5 years, the total energy generation through our solar PV systems is 4782151 kWh. Our plan is to incorporate other types of renewable sources such as from Wind Power, Fuel Cells, etc. The University intends to procure more power from utilities sourcing renewable power than fossil fuels.



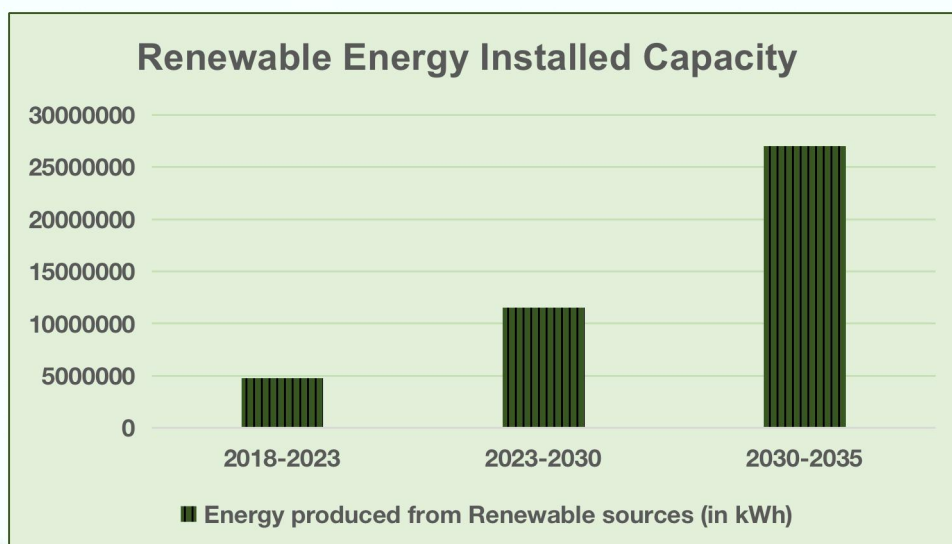


Figure 17. Evolution and projection of installed capacity (in kWh) of Renewable Energy at KIIT.

6. Sustainable Transportation

6.1 Alternative Transportation:

Promoting environmentally friendly transport options is crucial for lowering carbon emissions. Biking, walking, carpooling, and using public transportation are all forms of alternative mobility that we support and encourage. We have lessened the reliance on single-occupancy automobiles and promoted a culture of sustainable mobility by providing infrastructure and incentives for these alternatives. The number of electric vehicles used by our university is growing yearly. By 2030, we want a higher proportion of people in our community to use alternate forms of transportation.

6.2 Electric Vehicles (EVs)

One of the most important components of our sustainable mobility plan is the uptake of electric vehicles (EVs). Within our organisation, we prioritise the usage of electric fleet vehicles and make investments in EV charging infrastructure. Additionally, we inform and entice employees and students to think about EVs for their own transportation requirements.

By encouraging EV adoption, we hope to lower transportation-related carbon emissions and get closer to our objective of becoming carbon neutral. Green vehicles (powered by solar energy and an electric battery) have been built by the University's automobile society and the KIIT

student research centre for use in campus transportation and for conducting green vehicle research. Our goal is to have 70% of our fleet battery operated by 2030.



Figure 18. KIIT offers battery-operated shuttle services for intra-university transport.

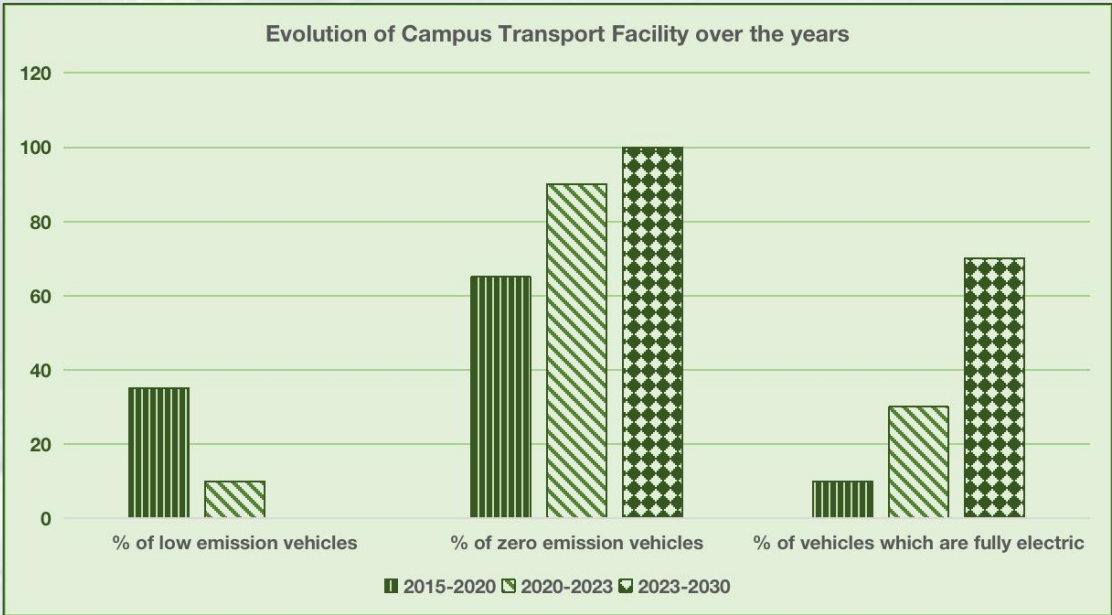


Figure 19. Evolution and projection of our transport system.

7. Education and Awareness

7.1 Sustainability Education

KIIT's motto "Education for All" aims to eradicate poverty through education, enabling people to invest in a better quality of life and contribute to climate action. By providing skills and knowledge to disadvantaged individuals, KIIT breaks the cycle of poverty and fosters sustainable practices. Through awareness and research, the institution promotes environmentally conscious citizens and advocates for policy changes. Education empowers women, leading to better family planning and lower population growth, positively impacting resource consumption and climate change. KIIT's commitment to education plays a crucial role in creating a more sustainable and equitable world.

We have incorporated sustainability concepts and education about climate change into our curriculum, training courses, and workshops in order to make a long-lasting impact. We have given our students, employees, and teachers the knowledge and skills they need to contribute to a sustainable future, and we will keep doing so. 'Environmental Science' is offered as a mandatory course for all the students of the University to emphasize the rising issues of pollution and its effect on climate.

On top of that, our University's varied programmes currently offer 51 courses on sustainability and climate change, and we aim to grow that number to 100 courses by 2030. Along with organising seminars, conferences, and guest lectures from sustainability professionals, we also work with other partners to improve the educational possibilities related to sustainability.

7.2 Awareness Campaigns

It is crucial to involve our community in sustainability initiatives. Every year, we run more than 150 sustainability-related awareness initiatives to inform and motivate our academics, staff, and students and we want to increase it to 300 by 2030.



Figure 20. Evolution and projection of of Educational Courses and Awareness programs.

These efforts concentrate on increasing public knowledge of sustainability issues, the SDGs of the UN, climate action, and personal accountability. We promote a sense of common purpose and promote sustainable practises through these projects. We also honour the accomplishments of people and teams bringing about good change while celebrating sustainability milestones.

8. Collaboration and Partnerships

8.1 Stakeholder Engagement

Engaging stakeholders is essential for the success of our sustainability initiatives. We actively involve our students, staff, faculty, alumni, and local community in decision-making processes and seek their input and feedback. Regular dialogue and collaboration ensures that our sustainability efforts align with the needs and aspirations of our stakeholders. We establish sustainability committees and forums to facilitate stakeholder engagement and promote co-creation of sustainability solutions.

8.2 Partnerships

We are aware of how effective collaborations can be in bringing about positive change. To share best practises, make the most of resources, and work together to address climate change and sustainability concerns, we

are looking to collaborate with local and international organisations, research institutes, industries, and governmental agencies. Through these collaborations, we are able to influence more people outside of our school. In order to support worldwide efforts for a sustainable future, we actively participate in regional and international sustainability networks and initiatives. By 2030, we want to treble the number of alliances we have with academic institutions, scientific research facilities, and commercial enterprises.

8.3 Alumni Engagement and Collaboration

KIIT University, a renowned educational institution in India, has produced a multitude of exceptional graduates who have gone on to make significant contributions in various fields. Among these fields, one area stands out as crucial to the future of humanity and our planet - climate sustainability. The alumni of KIIT University have emerged as champions in the global fight against climate change, demonstrating their commitment to environmental preservation through innovative solutions, impactful initiatives, and policy advocacy. A significant percentage, approximately 35%-45%, of KIIT's alumni, are actively engaged in addressing Climate Sustainability across diverse fields.

- ✧ ***Climate-conscious Entrepreneurship:*** A remarkable aspect of KIIT University's alumni community is the number of entrepreneurs who have embraced climate-conscious business practices. These forward-thinking graduates have launched startups and companies that prioritize sustainability and eco-friendliness. By incorporating renewable energy, sustainable supply chains, and waste reduction measures, they are setting new standards for the business world. Not only are they proving that profitability and environmental responsibility can go hand in hand, but they also serve as inspiring examples for other aspiring entrepreneurs to follow suit.
- ✧ ***Research and Innovation:*** Several KIIT alumni have made their mark in the field of environmental research and innovation. These individuals have been at the forefront of developing cutting-edge technologies to combat climate change. From renewable energy advancements and green materials to carbon capture and storage solutions, their research has played a pivotal role in shaping a more sustainable future. Moreover, their contributions have been recognized by prestigious institutions and organizations worldwide, further promoting the institution's commitment to climate sustainability.

- ✧ ***Global Advocacy and Leadership:*** Many KIIT graduates have taken up leadership positions in international environmental organizations and governmental bodies. Their roles involve formulating and implementing climate policies, advocating for green initiatives, and negotiating international agreements to address climate challenges. The alumni's dedication to creating a healthier planet through policy and diplomatic means is evident, as they work tirelessly to mobilize global efforts and foster cooperation between nations.
- ✧ ***Social and Community Initiatives:*** The impact of KIIT alumni in climate sustainability extends beyond the professional realm. Numerous graduates have initiated grassroots projects and community-based efforts to raise awareness about environmental issues and drive positive change at the local level. These initiatives range from tree-planting campaigns and waste management drives to education programs on sustainable practices. By actively engaging with communities, the alumni have demonstrated their commitment to nurturing a culture of environmental consciousness and empowering the public to take action.
- ✧ ***Climate Education and Awareness:*** KIIT alumni have also made significant contributions in the realm of climate education and awareness. Through public lectures, workshops, and online platforms, they have been instrumental in disseminating accurate information about climate change and its impact on the world. By fostering environmental literacy, these individuals are empowering people to make informed decisions and adopt sustainable practices in their daily lives, thereby multiplying the collective efforts to combat climate change.

The alumni of KIIT University have truly emerged as influential change-makers in the global fight for climate sustainability. Through their entrepreneurship, research, advocacy, community initiatives, and educational endeavors, they have contributed significantly to shaping a greener, more sustainable world. Their efforts serve as an inspiring testament to the institution's commitment to fostering socially responsible and environmentally conscious individuals.

As KIIT University continues to produce exceptional graduates, it is certain that their commitment to climate sustainability will remain at the forefront of their endeavors, further advancing the cause and leading humanity towards a more sustainable and resilient future.

9. Monitoring and Reporting

9.1 Measurement and Evaluation

We are committed to monitoring our sustainability progress. We have established clear metrics and targets to measure our performance, regularly assessing our sustainability initiatives, and identifying areas for improvement. By tracking our progress, we ensure accountability and make informed decisions for future actions. We regularly review and update our targets to align with evolving best practices and scientific recommendations.

We have implemented IoT enabled Smart Environment Monitoring systems in and around the University campus. KIIT aimed to implement a Smart Sensors system for continuously monitoring air, soil, and water quality within their large campuses. The system utilizes a variety of sensors to measure parameters such as PM 2.5, PM 10, CO, CO₂, NO, NO₂, SO₂, O₃, Temperature, Humidity, Soil Moisture, NPK (Nitrogen, Phosphorous, Potassium), pH, TDS, Turbidity, and Iron levels. Sensors are strategically placed, and data is integrated into a centralized platform to calculate the Air Quality Index (AQI) and provide real-time monitoring, generating alerts if parameters exceeded set thresholds.

Regular maintenance, calibration, and awareness campaigns are conducted to ensure accurate and reliable data, enabling KIIT to take proactive measures in preserving a healthy environment for its campus community.



Figure 21. Soil Quality Monitoring sensors.



Figure 22. Water Quality Monitoring sensors.



Figure 23. Air Quality Monitoring sensors.



Figure 24. Environment Monitoring systems displaying real-time data.

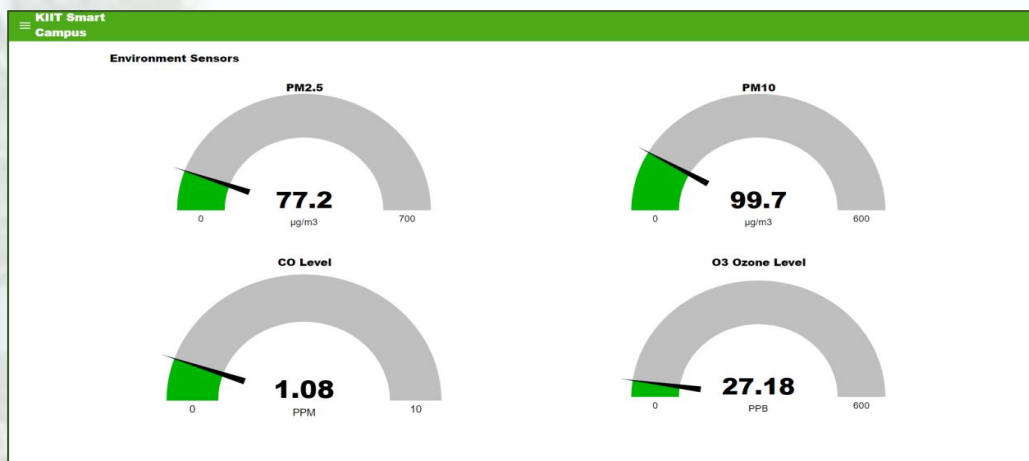


Figure 25. Environment monitoring data displayed on web in real-time.

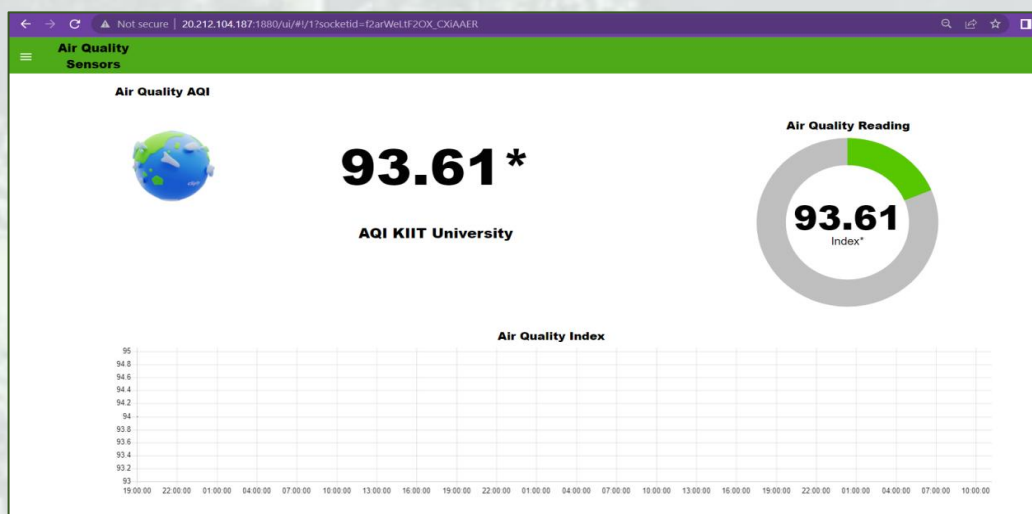


Figure 26. Air-quality monitoring data displayed on web in real-time.

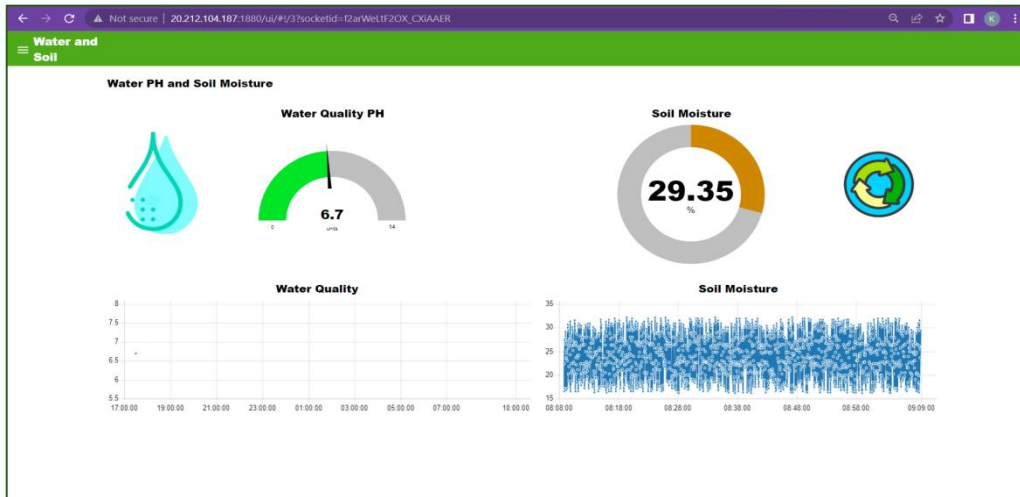


Figure 27. Water and soil quality data displayed on web in real-time.

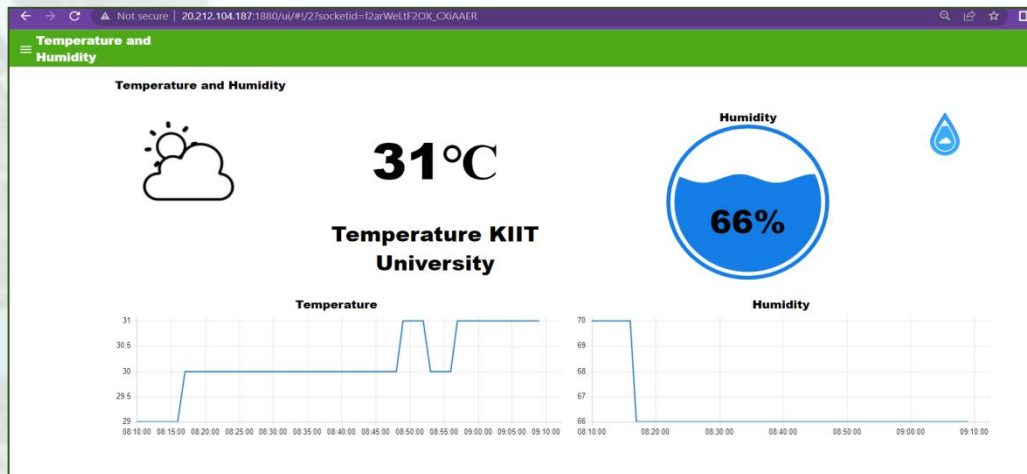


Figure 28. Temperature and Humidity data displayed on web in real-time.



Figure 29. Overall analysis window for all the environmental data with minimum and maximum values.

9.2 Transparent Reporting

Transparency is fundamental to our sustainability efforts. We provide regular updates on our sustainability performance, progress, and achievements to our stakeholders through public reports, websites, and other communication channels. We communicate our challenges, successes, and lessons learned, enabling our stakeholders to hold us accountable and engage in meaningful dialogue. We also participate in sustainability reporting frameworks and share our data and experiences to contribute to bench-marking and knowledge sharing.

10. Pathway to Carbon Neutrality for KIIT University

➤ Year 2020-2025

Conduct a comprehensive greenhouse gas inventory:

- ✧ Measure and analyze the university's current carbon footprint and emissions sources.
- ✧ Identify the main contributors to emissions, such as energy consumption, transportation, waste, and procurement.

Set ambitious reduction targets:

- ✧ Establish quantifiable and time-bound targets to reduce greenhouse gas emissions.
- ✧ Develop a road-map outlining specific strategies and actions to achieve these targets.
- ✧ Prioritize emissions reduction in energy-intensive areas, such as buildings and transportation.

Improve energy efficiency:

- ✧ Retrofit existing buildings with energy-efficient technologies, such as LED lighting, smart thermostats, and occupancy sensors.
- ✧ Implement energy management systems to monitor and optimize energy consumption.
- ✧ Promote energy-saving practices among staff, faculty, and students.

Increase renewable energy generation:

- ✧ Install on-site solar panels or explore other renewable energy sources to generate clean electricity.
- ✧ Seek partnerships with local renewable energy providers to procure renewable energy.
- ✧ Invest in energy storage systems to maximize the utilization of renewable energy.

Enhance waste management practices:

- ✧ Implement a comprehensive waste management system, including recycling, composting, and proper disposal of hazardous materials.
- ✧ Educate the university community about waste reduction and recycling initiatives.
- ✧ Encourage the use of recycled and sustainable materials on campus.

➤ Year 2026-2030

Expand sustainable transportation options:

- ✧ Improve cycling infrastructure and promote cycling as a viable mode of transportation.
- ✧ Encourage the use of public transit and carpooling through incentives and awareness campaigns.
- ✧ Invest in electric vehicle charging infrastructure and transition the university's fleet to electric vehicles.

Integrate climate change and sustainability across the curriculum:

- ✧ Incorporate climate change and sustainability topics into various academic programs and courses.
- ✧ Establish research centers and initiatives focused on climate change adaptation and mitigation.
- ✧ Foster interdisciplinary collaborations to address climate-related challenges.

Strengthen community engagement and partnerships:

- ✧ Collaborate with local communities, government agencies, and NGOs to develop climate resilience strategies.

- ✧ Engage in knowledge sharing and joint initiatives with other universities and research institutions.
- ✧ Establish partnerships with industry leaders to promote sustainable practices and innovation.

➤ **Year 2031-2040**

Achieve carbon neutrality in operations:

- ✧ Implement innovative technologies and practices to further reduce greenhouse gas emissions.
- ✧ Offset remaining emissions through investments in high-quality carbon offset projects.
- ✧ Monitor and verify progress towards carbon neutrality through regular audits and reporting.

Promote sustainable land use and biodiversity conservation:

- ✧ Develop and implement a biodiversity action plan to protect and enhance natural habitats on campus.
- ✧ Incorporate sustainable land management practices, such as organic gardening and native plant restoration.
- ✧ Engage students, faculty, and staff in conservation efforts and citizen science initiatives.

➤ **Year 2041-2050**

Adaptation and resilience-building:

- ✧ Conduct vulnerability assessments and develop adaptation strategies to address climate risks.
- ✧ Implement nature-based solutions, such as green infrastructure and urban forestry, to enhance resilience.
- ✧ Educate the community on climate change impacts and encourage preparedness and adaptive behavior.

Continuous monitoring, evaluation, and improvement:

- ✧ Regularly assess and report on the university's progress towards carbon neutrality and sustainability goals.
- ✧ Evaluate the effectiveness of implemented measures and identify areas for improvement.

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- ✧ Stay informed about emerging technologies and best practices to continually enhance sustainability efforts.

By following this pathway to carbon neutrality, KIIT University can lead by example and contribute to mitigating climate change while building resilience in Bhubaneswar. The steps outlined over the next three decades will require dedication, collaboration, and continuous monitoring to ensure progress towards a sustainable and climate-resilient future.

11. Conclusion

In conclusion, KIIT University is dedicated to leading by example and making a positive impact on the environment. Our Sustainability and Climate Action Policy provides a comprehensive framework for achieving our sustainability goals, with a particular focus on reaching carbon neutrality by 2050. Through environmental stewardship, energy efficiency, sustainable transportation, education and awareness, collaboration and partnerships, monitoring and reporting, we are committed to creating a sustainable future for our institution and beyond.