Climate Action Project Report

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Abstract

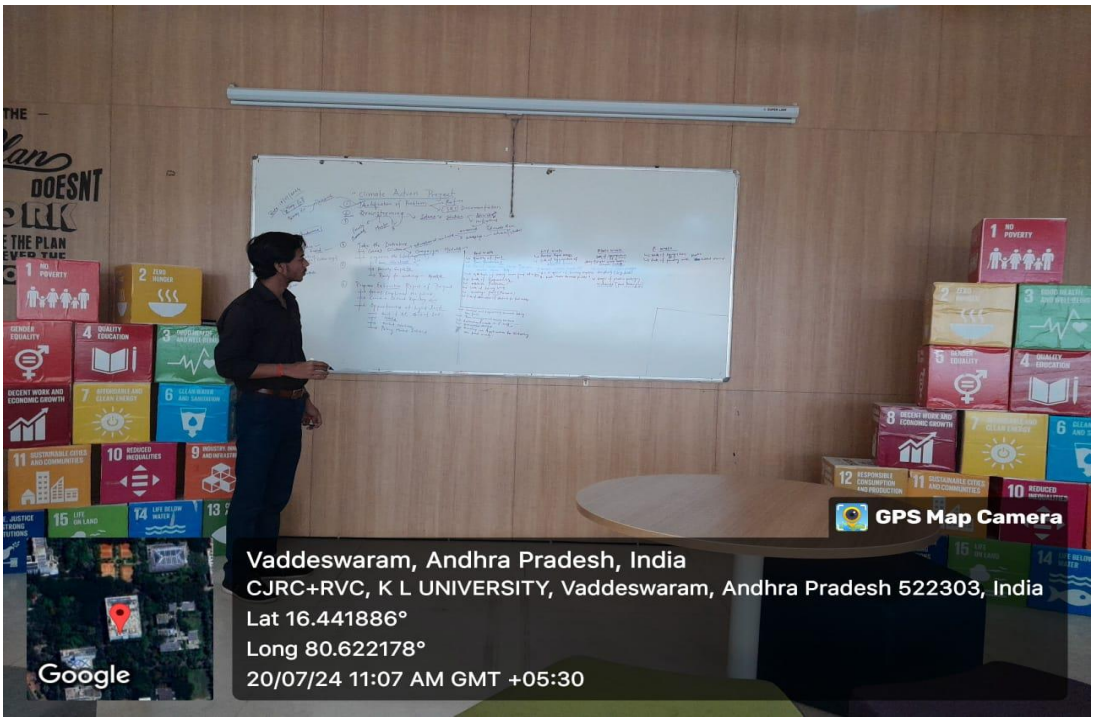
The "Climate Action Project" addresses the urgent need for sustainable practices to mitigate the adverse effects of climate change. This project adopts a comprehensive approach, combining scientific research, community engagement, and policy advocacy to foster environmental resilience. Through extensive data collection and analysis, the project

identifies key areas of concern, including plastic usage, carbon footprint, food wastage, soil waste, e-waste, solid waste, and chemical waste generated on our university campus. Innovative strategies, such as recycling plastic waste, soil waste management, using food waste for soil improvement, renewable energy adoption, reforestation programs, educational campaigns, workshops, and sustainable agriculture practices, are implemented to combat these issues.

Community involvement is a cornerstone of the project, with educational campaigns and workshops designed to raise awareness and promote environmentally friendly behaviors. Collaborations with local governments and organizations ensure that the project's initiatives are scalable and adaptable to various regional contexts. Policy recommendations based on empirical evidence are proposed to support long-term sustainability goals and enforce environmental regulations.

Preliminary results indicate a significant reduction in carbon footprint, increased plastic recycling, and reduced food wastage, along with a rise in community participation in sustainable practices. This project demonstrates the critical role of integrated efforts in addressing climate change and sets a precedent for future initiatives aimed at environmental preservation and resilience.

Introduction : Project Briefing



In response to the escalating challenges of climate change, our university has embarked on a comprehensive Climate Action Project designed to enhance sustainability and reduce our environmental impact. This initiative focuses on four critical areas: reducing plastic usage, minimizing carbon footprint, managing food waste, and improving soil waste management.

Plastic pollution has become a significant environmental issue, with detrimental effects on ecosystems and wildlife. Our project aims to drastically reduce plastic use across campus by implementing sustainable alternatives and promoting recycling practices, conducting workshops / seminars.

Food waste management is crucial in mitigating the environmental impact of discarded food. We are implementing strategies for better food

inventory management, composting programs, and educational initiatives to reduce waste and improve the efficiency of our food systems.

Lastly, soil waste management is integral to maintaining healthy campus grounds and reducing landfill waste. Our approach includes the promotion of composting, proper disposal of organic materials, and soil health improvement practices.

Through these targeted actions, our university aims to create a model of sustainability that not only addresses pressing environmental issues but also fosters a culture of ecological responsibility among students, faculty, and staff.

Problem Identification

1. **Plastic Waste:**

- There is no segregation of different category of waste generated in the campus like plastic waste, E-Waste, Solid Waste, paper waste at primary disposal level after disposing together, It's very hard to segregate later at field.

- Plastic packaging materials are being used in hostels-canteens for parcels which generate lots of plastic waste.

- Plastic waste is recycled by JINDAL waste management company for every once in 2 months which is not sufficient.

Water Treatment Plant Survey

- There is disposal of tiny shampoo packets, sachets, and small solid materials in the hostel which blocks the pathway of water flow in the water pipe which results in extra hard work for workers there.

2. Paper Waste

- Most of the waste generated in the form of Collected Question paper and answer sheets, they are being taken up and recycled by **ITC company,** however majority of records practical manuals, study materials and half return notebooks which are widely distributed among the students is not being recycled.

3. Solid Waste

- Clothes and shoes waste which cannot be used is not being recycled, it is just being dumped.
- There is lack of dedicated human resource to handle the segregation of waste which is being generated in our campus as said by officer of Waste segregation Area.
- There is no proper roof in Segregation unit, because of rain and open exposure to the atmosphere, The segregated waste is getting damaged before being taken by the vendors, so the vendors avoid taking dampened or rusted waste.

4. Food Waste

- As per the survey of the students there is a lack of quality in the food which is leading to the wastage of food in huge amount.
- There is time constraint among the students in lunch hour and also less no: of serving units which is also leading to the food wastage in campus.

- There is a lack of responsibility and attitude problem among the students while taking the food, which is leading to wastage of food.

There is Inadequate daily estimation of students in hostels and hence most of the food is being wasted. The problem in estimation is due to the time constraints students are facing. There is lack of awareness in students regarding the portion of food students must take.

Problem Analysis

Analysis of Waste Management Problems in the Campus

1. Plastic Waste

- **Lack of Waste Segregation**: The primary disposal system does not separate different types of waste, such as plastic, e-waste, solid waste, and paper. This lack of initial segregation complicates the sorting process later, leading to inefficiency and increased labor.

- **Hostel Waste Issues**: Disposal of small plastic items like shampoo packets and sachets in hostel water pipes causes blockages, necessitating additional labor for maintenance.
- **Excessive Plastic Packaging**: Hostels and canteens use a significant amount of plastic packaging for food parcels, contributing to large quantities of plastic waste.
- **Infrequent Recycling**: The current recycling arrangement with ZINDHAL Waste Management, which occurs once every two months, is insufficient to handle the volume of plastic waste generated.

2. Paper Waste

- **Recycling Gaps**: Although collected question papers and answer sheets are recycled by ITC, a significant portion of paper waste, including practical manuals, study materials, and partially used notebooks, is not being recycled.
- **Potential for Increased Recycling**: There is an opportunity to improve recycling rates by including all types of paper waste generated by students.

3. Solid Waste

- **Non-Recycled Waste**: Items such as clothes and shoes that are no longer usable are being dumped instead of recycled.
- **Lack of Human Resources**: The waste segregation process suffers from a lack of dedicated personnel, as noted by the waste segregation area officer.
- **Inadequate Facilities**: The segregation unit lacks proper roofing, exposing waste to rain and other environmental factors. This exposure damages the waste, making it less desirable to vendors and leading to further accumulation of waste.

4. Food Waste

- **Quality Issues**: Poor food quality leads to significant wastage, as students are reluctant to consume the provided meals.
- **Logistical Constraints**: Time constraints during lunch hours and an insufficient number of serving units result in food wastage.
- **Student Responsibility**: There is a lack of responsibility and awareness among students about taking only the food they need, contributing to excessive food waste.
- **Inaccurate Estimations**: Inadequate daily estimations of student numbers in hostels lead to over-preparation of food. The difficulty in estimation is compounded by the time constraints faced by students, causing further wastage.

Summary

The primary issues in campus waste management revolve around inadequate initial segregation, insufficient recycling processes, lack of infrastructure, and behavioral challenges among students. Addressing these problems requires a multi-faceted approach, including improving waste segregation practices, enhancing recycling efforts, investing in better facilities, and fostering a culture of responsibility and awareness among students regarding waste generation and management.

Solution:

Proposed Solutions to Campus Waste Management Problems

1. Plastic Waste

- **Implement Segregation Systems**: Introduce separate bins for plastic, e-waste, solid waste, and paper at primary disposal points across the campus. This will simplify later segregation and improve recycling efficiency.

- **Hostel Waste Management**: Install waste disposal systems in hostels to handle small plastic items, preventing blockages in water pipes. Educate students on proper disposal practices.
- **Reduce Plastic Packaging**: Encourage hostels and canteens to use eco-friendly packaging materials. Implement a program to reduce plastic packaging by promoting reusable containers and providing incentives for their use.
- **Increase Recycling Frequency**: Negotiate with ZINDHAL Waste Management to increase the frequency of plastic waste collection. Alternatively, seek additional waste management partners to handle the excess plastic waste.

2. Paper Waste

- **Expand Recycling Programs**: Partner with ITC or other recycling companies to include all types of paper waste, such as practical manuals, study materials, and partially used notebooks. Set up collection points for these items across the campus.
- **Awareness Campaigns**: Conduct campaigns to educate students and staff on the importance of recycling all paper products. Provide clear instructions and accessible recycling bins.

3. Solid Waste

- **Recycle Usable Items**: Establish partnerships with organizations that can recycle or repurpose clothes and shoes. Set up donation bins for items that can still be used.
- **Increase Staffing**: Allocate resources to hire additional personnel dedicated to waste segregation. Provide training to ensure effective waste management practices.
- **Improve Facilities**: Invest in proper infrastructure for the segregation unit, including roofing and secure storage areas to protect segregated waste from environmental damage. This will make the waste more acceptable to vendors.

4. Food Waste

- **Improve Food Quality**: Work with catering services to enhance the quality of food provided in hostels and canteens. Conduct regular surveys to get feedback from students and make necessary adjustments.
- **Optimize Serving Processes**: Increase the number of serving units during peak times to reduce time constraints. Implement a pre-order system where students can indicate their meal preferences ahead of time.
- **Student Education**: Run awareness campaigns to educate students on the importance of taking only the food they need. Introduce portion control strategies, such as offering different serving sizes.
- **Accurate Estimations**: Develop better methods for estimating the number of students dining in hostels daily. Utilize data analytics to predict attendance more accurately, reducing over-preparation and subsequent waste.

Implementation Plan

- **Segregation System Rollout**: Phase 1 - Install new bins and launch awareness campaigns (3 months).
- **Hostel Waste Solutions**: Phase 1 - Install disposal systems and educate students (2 months).
- **Plastic Packaging Reduction**: Phase 2 - Implement eco-friendly packaging and incentives (4 months).
- **Increased Recycling**: Phase 2 - Negotiate with ZINDHAL or find new partners (3 months).
- **Expanded Paper Recycling**: Phase 1 - Set up collection points and expand partnerships (3 months).
- **Solid Waste Management**: Phase 2 - Partner with recycling organizations and improve facilities (6 months).
- **Food Waste Reduction**: Phase 1 - Improve food quality and serving processes (4 months), Phase 2 - Implement pre-order system and portion control (3 months).

Monitoring and Evaluation

- **Regular Audits**: Conduct monthly audits to assess the effectiveness of waste segregation and recycling programs.
- **Feedback Mechanisms**: Set up channels for students and staff to provide feedback on waste management practices.
- **Progress Reports**: Publish quarterly reports detailing progress, challenges, and adjustments made to improve waste management practices.

By implementing these solutions, the campus can significantly improve its waste management practices, reduce environmental impact, and foster a culture of sustainability among students and staff.

Overview of the Food Waste Reduction Application Project

The proposed cross-platform application aims to reduce food wastage on campus by allowing students and staff to manage their meal preferences, report waste, and engage in a point-based reward system. This application will provide real-time information, promote responsible behavior, and streamline waste management processes. The key functionalities and modules of the application are detailed below.

Key Functionalities and Modules

1. User Profiles and Authentication

- **User Registration and Login**: Secure user registration and login system for students and staff.
- **Profile Management**: Each user has a personal profile containing their preferences, meal attendance records, and reward points.
- **Role-Based Access**: Different access levels for students, staff, and administrators.

2. Meal Attendance Management

- **Meal Menu Display**: Daily menus for breakfast, lunch, and dinner are displayed in the app.
- **Meal Attendance Marking**: Users can mark their presence or absence for each meal. This feature helps in accurate meal preparation estimates.
- **Notifications and Reminders**: Push notifications and reminders for users to mark their meal attendance.

3. Waste Reporting and Management

- **Micro/Precise Location Tagging**: Users can tag the exact location of waste materials within the campus.
- **Waste Reporting**: Users can upload pictures and descriptions of waste issues, which are then sent to the relevant waste management team.
- **Real-Time Alerts**: Waste management workers receive real-time alerts for reported waste, allowing for prompt action.

4. Reward System

- **Point-Based Rewards**: Users earn points for responsible behavior, such as regular meal attendance marking and waste reporting.
- **Profile Dashboard**: Users can view their points and reward history on their profiles.

- **Privileges and Incentives**: Points can be redeemed for various privileges and incentives within the campus, such as discounts at canteens or access to special events.

5. Data Analytics and Reporting

- **Meal Attendance Analytics**: Analysis of meal attendance data to optimize food preparation and reduce wastage.
- **Waste Management Analytics**: Reports on waste incidents and resolution times to improve waste management efficiency.
- **User Behavior Insights**: Insights into user engagement and reward system effectiveness.

6. Administration and Management

- **Admin Dashboard**: Comprehensive dashboard for administrators to manage users, view analytics, and configure system settings.
- **User Management**: Tools for adding, editing, and removing users and managing their roles.
- **System Configuration**: Settings for managing meal menus, notification preferences, and reward system parameters.

Workshop and Conferences: After figuring the problems of the KL University campus, After annlysis and brainstorming, We figured out that mostly problems lies among the students level.

So, We tried to solve through implementing the solutions in the University campus through Climate Action project, seminar, workshop and conferences.

Above is the glimpses of Workshop organized at KL Deemed To Be University to educate the students towards Climate Change, Waste management with experts from Water Treatment plant manager of KL University Mr. Gopal Sir, Assocoate Dean of Planning and Development Dr. Chhari Sir.

We all the team members have presented our solution in the workshop and got the insights from experts from different area.

Team of Climate Action Project

Vikash Vibhuti : Presenting the Project

Director Of CIIE : Dr. Narashimha Raju (Professor ECE)

The Director of the Centre for Innovation Incubation and Entrepreneurship (CIIE) addressed a workshop at L515 Seminar Hall as a resource person. During the session, he discussed the basics of climate change, emphasizing how human activities contribute to these changes. He outlined the impacts of climate change at both micro and macro levels, highlighting the importance of understanding these effects. Furthermore, he encouraged technology-driven scholars to take proactive steps in addressing climate change and shared methodologies for timely mitigation efforts.

Suggestions and Recommendations

1. Plastic Waste Management

- **Enhanced Waste Segregation:** Implement a more robust segregation system at the primary disposal points to ensure that plastic waste is separated from other types of waste. This will make recycling processes more efficient.
- **Education and Awareness Programs:** Conduct regular workshops and seminars to educate students and staff on the importance of proper waste disposal and the environmental impact of plastic waste. Encourage the use of reusable items.
- **Increase Recycling Frequency:** Collaborate with waste management companies to increase the frequency of plastic waste collection and recycling. Alternatively, seek partnerships with additional waste management companies to handle the volume of plastic waste.
- **Promotion of Eco-Friendly Alternatives:** Promote the use of biodegradable and eco-friendly packaging materials in canteens and hostels. Provide incentives for using reusable containers.

2. Paper Waste Management

- **Expand Recycling Initiatives:** Partner with recycling companies to include all types of paper waste, such as practical manuals, study materials, and partially used notebooks. Establish collection points across the campus for these items.
- **Awareness Campaigns:** Raise awareness among students and staff about the importance of recycling all paper products. Provide clear instructions and accessible recycling bins to encourage participation.

3. Solid Waste Management

- **Recycle Usable Items:** Establish partnerships with organizations that can recycle or repurpose clothes and shoes. Set up donation bins for items that can still be used.
- **Increase Staffing:** Allocate resources to hire additional personnel dedicated to waste segregation. Provide training to ensure effective waste management practices.

- **Improve Infrastructure:** Invest in proper infrastructure for the segregation unit, including roofing and secure storage areas, to protect segregated waste from environmental damage. This will make the waste more acceptable to vendors.

4. Food Waste Management

- **Improve Food Quality:** Work closely with catering services to enhance the quality of food provided in hostels and canteens. Conduct regular surveys to get feedback from students and make necessary adjustments.
- **Optimize Serving Processes:** Increase the number of serving units during peak times to reduce time constraints and food wastage. Implement a pre-order system where students can indicate their meal preferences ahead of time.
- **Student Education:** Run awareness campaigns to educate students on the importance of taking only the food they need. Introduce portion control strategies, such as offering different serving sizes.
- **Accurate Estimations:** Develop better methods for estimating the number of students dining in hostels daily. Utilize data analytics to predict attendance more accurately, reducing over-preparation and subsequent waste.

5. Community Involvement

- **Collaborate with Local Governments:** Work with local governments and organizations to scale and adapt the project's initiatives to various regional contexts. Ensure policy recommendations are based on empirical evidence to support long-term sustainability goals.
- **Engage the Community:** Foster community involvement through educational campaigns and workshops designed to raise awareness and promote environmentally friendly behaviors. Encourage active participation in sustainability efforts.

6. Monitoring and Evaluation

- **Regular Audits:** Conduct monthly audits to assess the effectiveness of waste segregation and recycling programs. Identify areas for improvement and make necessary adjustments.
- **Feedback Mechanisms:** Establish channels for students and staff to provide feedback on waste management practices. Use this feedback to continuously improve the program.
- **Progress Reports:** Publish quarterly reports detailing progress, challenges, and adjustments made to improve waste management practices. Share these reports with stakeholders to maintain transparency and accountability.

Conclusion

The Climate Action Project at our university demonstrates a comprehensive and integrated approach to addressing the critical issue of climate change. By focusing on key areas such as plastic waste, paper waste, solid waste, and food waste, the project identifies and tackles the root causes of environmental degradation on our campus.

Plastic Waste: The implementation of segregation systems and the promotion of eco-friendly packaging aim to significantly reduce plastic waste. Increasing the frequency of recycling efforts will further enhance waste management efficiency.

Paper Waste: Expanding recycling programs to include all types of paper waste and raising awareness among students and staff will improve recycling rates and reduce the volume of paper waste.

Solid Waste: Establishing partnerships for recycling usable items like clothes and shoes, increasing staffing, and improving facilities will address the challenges in solid waste management and reduce landfill contributions.

Food Waste: Enhancing food quality, optimizing serving processes, and educating students on responsible consumption are critical steps toward

minimizing food wastage. Accurate estimation of student attendance will also help in better food management.

Through community involvement, educational campaigns, workshops, and collaborations with local governments and organizations, the project promotes environmentally friendly behaviors and scalable, adaptable initiatives. Policy recommendations based on empirical evidence support long-term sustainability goals and enforce environmental regulations.

The preliminary results of the project show a significant reduction in carbon footprint, increased recycling rates, and reduced food wastage, along with greater community participation in sustainable practices. This project underscores the importance of integrated efforts in combating climate change and sets a benchmark for future initiatives aimed at environmental preservation and resilience.

By fostering a culture of ecological responsibility among students, faculty, and staff, the Climate Action Project not only addresses pressing environmental issues but also paves the way for a sustainable future. The ongoing monitoring and evaluation of the project's effectiveness ensure continuous improvement and adaptation to emerging challenges.

In conclusion, the Climate Action Project exemplifies the university's commitment to sustainability and serves as a model for other institutions to follow in the global fight against climate change.