

LIBRARY MANAGEMENT SYSTEM

A MINI-PROJECT REPORT

Submitted by

HARSHINI AKSHAYA A S (220701088)

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IN

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RAJALAKSHMI
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An AUTONOMOUS Institution
Affiliated to ANNA UNIVERSITY, Chennai

RAJALAKSHMI ENGINEERING COLLEGE

AUTONOMOUS, CHENNAI

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RAJALAKSHMI ENGINEERING COLLEGE

CHENNAI - 602105

BONAFIDE CERTIFICATE

Certified that this project report “**Feed - Food Donation and Sustainable Waste Management Platform**” is the bonafide work of “**Harshini Akshaya A S (220701088).**” who carried out the project work for the subject
CS19542 – Internet Programming

Dr. P Kumar

HEAD OF THE DEPARTMENT

Professor and Head

Department of

Computer Science and Engineering

Rajalakshmi Engineering College

Rajalakshmi Nagar

Thandalam

Chennai - 602105

Mr. K Deepak Kumar

SUPERVISOR

Assistant Professor (SG)

Department of

Computer Science and Engineering

Rajalakshmi Engineering College

Rajalakshmi Nagar

Thandalam

Chennai - 602105

Submitted to Project and Viva Voce Examination for the subject CS19542 - INTERNET
PROGRAMMING held on _____.

INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

Feed is a platform designed to foster community involvement and promote sustainable food waste management. It allows users to share and discover food donation events through interactive maps, enhancing community engagement. Additionally, users can submit recycling requests, specifying whether food waste will be picked up or dropped off at a biogas plant. The platform ensures a structured workflow with admin verification and approval by biogas plant administrators, facilitating eco-friendly practices.

Built with React, Leaflet, and Tailwind CSS, the frontend offers an intuitive and visually appealing user interface. The backend, powered by Node.js, Express, and MongoDB, provides secure and efficient data handling with JWT authentication and bcrypt-based password hashing. Tools like Multer and Recharts enhance functionality with file uploads and data visualization. By integrating modern technologies and a robust workflow, *Feed* addresses the dual goals of reducing food waste and fostering community participation.

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CHAPTER 1

1.1 INTRODUCTION

Feed is an innovative platform designed to promote community involvement and sustainable food waste management. The system provides users with an interactive space to share and participate in food donation events, enabling resource redistribution and reducing food insecurity. Additionally, it allows users to submit recycling requests for food waste, specifying either pickup or drop-off at biogas plants. By integrating features like admin verification and biogas plant approval, *Feed* ensures seamless coordination between users and administrators, fostering efficient food waste management and eco-friendly practices. With a robust technological foundation, the platform bridges the gap between community engagement and environmental sustainability.

1.2 SCOPE OF THE WORK

Feed addresses the challenges of food waste and community engagement by offering the following functionalities:

- **Food Donation Sharing:** Users can post and explore donation events via interactive maps.
- **Community Engagement:** Features like liking and sharing events encourage participation.
- **Recycling Requests:** Facilitates submission of pickup or drop-off requests for food waste.
- **Admin Verification:** Ensures authenticity of requests via admin oversight.
- **Biogas Plant Approval:** Enables biogas plant administrators to manage recycling requests.
- **Data Visualization:** Provides insights into participation trends for event optimization.

1.3 PROBLEM STATEMENT

Food waste is a critical issue, with substantial amounts discarded despite widespread food insecurity. The lack of structured systems for food donation and recycling results in inefficiencies and missed opportunities for sustainability.

Some common challenges include:

- Limited platforms for organizing food donation events effectively.
- Lack of streamlined processes for food waste recycling.
- Inefficient verification and approval workflows, reducing trust and participation.
- Poor community awareness and engagement due to absence of interactive tools.

1.4 AIM AND OBJECTIVES OF THE PROJECT

Aim:

To develop a comprehensive and user-friendly platform that fosters food donation and facilitates sustainable food waste management through technology-driven solutions.

Objectives:

- **Community Participation:** Enable users to organize and discover food donation events via interactive maps.
- **Optimize Recycling Processes:** Provide features for submitting and managing food waste recycling requests efficiently.
- **Ensure Secure and Transparent Workflows:** Incorporate admin verification and biogas plant approval mechanisms.
- **Promote Awareness Through Data Visualization:** Use graphs and trends to highlight engagement and impact.
- **Enhance User Accessibility:** Develop an intuitive interface for seamless interaction.
- **Facilitate Reporting:** Generate reports to assess food waste reduction and community involvement.

CHAPTER 2

SYSTEM SPECIFICATIONS

2.1 HARDWARE SPECIFICATIONS

- **Processor:** Intel Core i5 or higher
- **RAM:** 8 GB or higher
- **Storage:** 500 GB HDD or 256 GB SSD (minimum)
- **Display:** 15-inch monitor with a resolution of 1366x768 or higher
- **Input Devices:** Keyboard and mouse
- **Network Connectivity:** Ethernet or Wi-Fi for database connectivity

2.2 SOFTWARE SPECIFICATIONS

- **Operating System:** Windows 10/11, Linux (Ubuntu, Fedora), or macOS
- **Database:** MongoDB (for storing and managing data efficiently)
- **Programming Languages:** JavaScript for both client-side and server-side development using Node.js
- **Frameworks and Libraries:**
 - Express.js** for backend logic and API development
 - React** for building a dynamic and interactive frontend
- **Development Tools:**
 - Vite** for a fast development server and build tool
 - Visual Studio Code (IDE)** for coding and debugging
- **Web Technologies:** HTML, Tailwind CSS, and React for creating a responsive and visually appealing frontend
- **Mapping and Data Visualization:**
 - Leaflet & React-Leaflet** for interactive maps
 - Recharts** for creating graphs and charts
- **Authentication and Security:**
 - JWT (JSON Web Token)** for secure authentication
 - bcrypt.js** for password hashing.
- **File Handling:** Multer for managing file uploads (e.g., event images, documents).

CHAPTER 4

MODULE DESCRIPTION

4.1. User Management Module

- **Purpose:** Manage user-related operations.
- **Features:**
 - User registration and login with secure authentication.
 - Role-based access control (e.g., Admin, User, Biogas Plant Administrator).
 - Profile management for users.
- **Database Tables:**
 - users (fields: id, name, email, password, role).

4.2. Food Donation Management Module

- **Purpose:** Facilitate food donation event sharing.
- **Features:**
 - Allow users to post food donation events.
 - Display events on interactive maps with event details.
 - Like and share donation events to encourage participation.
- **Database Tables:**
 - donations (fields: id, title, description, location, date, user_id, likes)

4.3. Recycling Request Management Module

- **Purpose:** Streamline the process of food waste recycling.
- **Features:**
 - Users can submit recycling requests for pickup or drop-off at biogas plants.
 - Admins verify and approve requests.
 - Biogas plant administrators approve or reject verified requests.
- **Database Tables:**
 - recycling_requests (fields: id, user_id, type, status, location, timestamp).

4.4. Interactive Map Module

- **Purpose:** Display donation events and recycling requests.
- **Features:**
 - Real-time updates for food donation events.
 - Map-based filtering of recycling requests and events.
 - Display biogas plant locations for user convenience.

- **Libraries Used:**
 - Leaflet & React-Leaflet for map rendering.

4.5. Admin Dashboard Module

- **Purpose:** Provide admins with control over the platform's operations.
- **Features:**
 - Manage users, recycling requests, and food donations.
 - View statistics on food donation participation and recycling efficiency.
 - Assign roles and approve biogas plant administrators.
- **Database Tables:**
 - Utilizes data from all major collections for dashboard insights.

4.6. Biogas Plant Management Module

- **Purpose:** Assist biogas plant administrators in managing recycling requests.
- **Features:**
 - Approve or reject verified requests.
 - View request history and manage plant operations.
 - Monitor recycling trends and optimize processes.
- **Database Tables:**
 - biogas_plants (fields: id, name, location, admin_id, requests_handled).

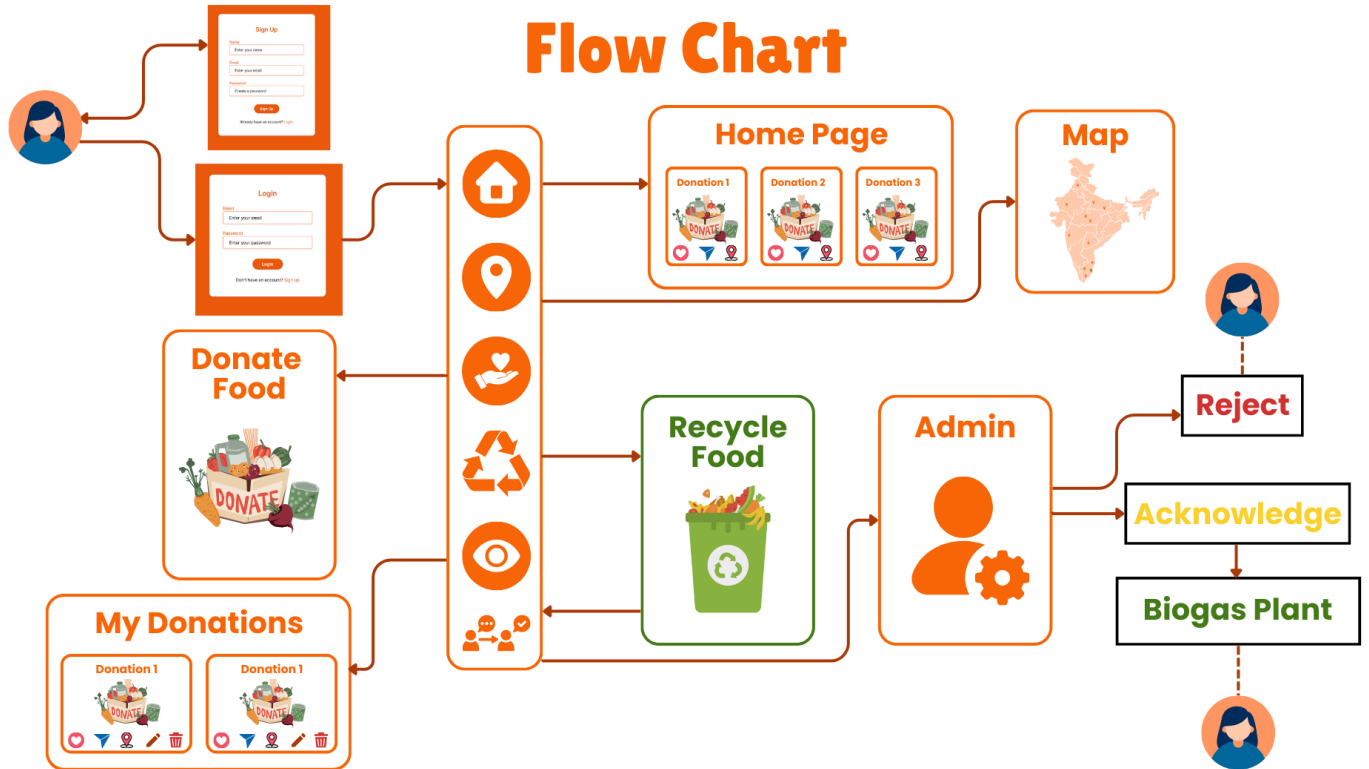
4.7. Notifications Module

- **Purpose:** Keep users informed about updates.
- **Features:**
 - Notify users of request approvals, rejections, or status changes.
 - Send reminders for upcoming food donation events.
 - Alert admins and biogas plants about pending actions.
- **Database Tables:**
 - notifications (fields: id, recipient_id, message, status, created_at).

CHAPTER 5

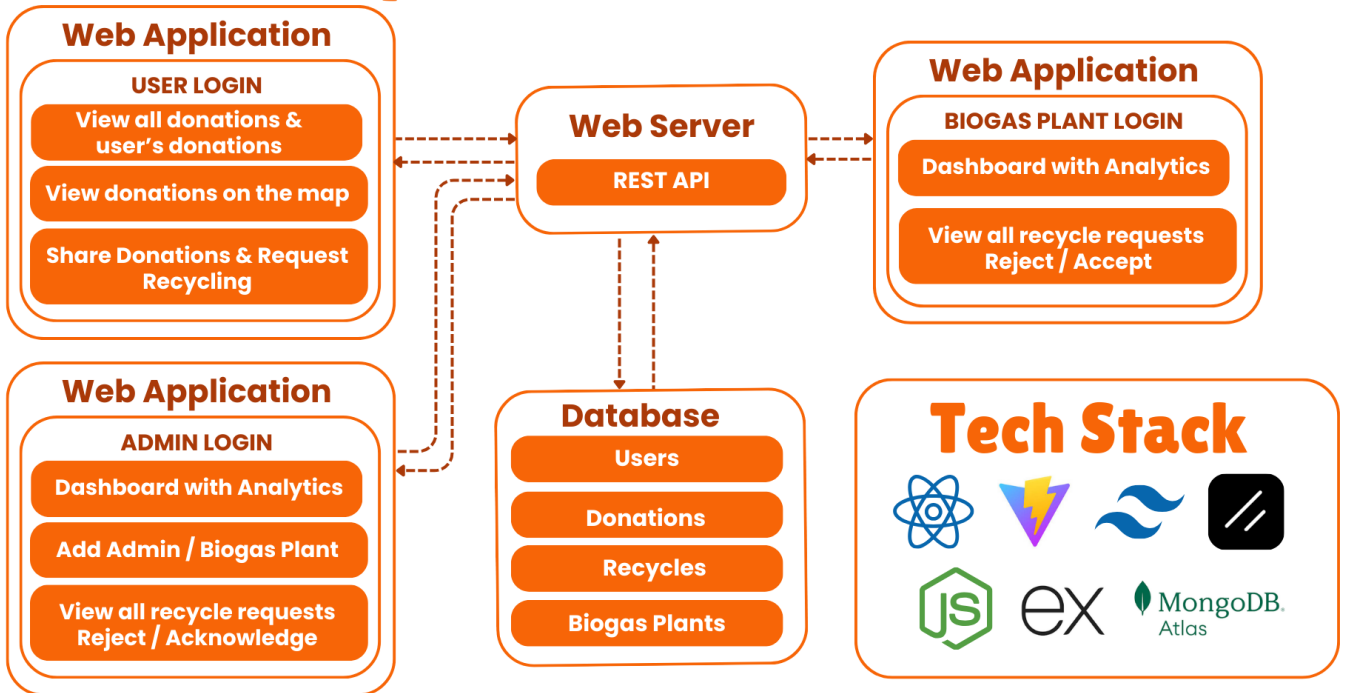
SYSTEM DESIGN

5.1 FLOW CHART



5.2 SYSTEM ARCHITECTURE

System Architecture



CHAPTER 6

SAMPLE CODING

App.jsx

```
import { BrowserRouter, Routes, Route, useLocation } from "react-router-dom";
import NavBar from "../components/custom/NavBar";
import Login from "../Pages/Login/Login";
import Signup from "../Pages/SignUp/SignUp";
import Home from "../Pages/Home/Home";
import Map from "../Pages/Map/Map";
import Recycle from "../Pages/Recycle/Recycle";
import DonateFood from "../Pages/Donate/Donate";
import { AuthProvider } from "../context/AuthProvider";
import { PrivateRoute } from "../context/PrivateRoute";
import MyDonations from "../Pages/MyDonations/MyDonations";
import RecycleRequests from "../Pages/RecycleRequests/RecycleRequests";

import Dashboard from "../Pages/Admin/Dashboard/Dashboard";
import ManageRequests from "../Pages/Admin/ManageRequests/ManageRequests";
import Manage from "../Pages/Admin/Management/Manage";
import ViewBiogasPlants from "../Pages/Admin/ViewBiogasPlants/ViewBiogasPlants";
import BiogasPlantDashboard from "../Pages/BiogasPlant/Dashboard/Dashboard";
import BiogasPlantRequests from "../Pages/BiogasPlant/ManageRequests/ManageRequests";

const RoutesComponent = () => {
  return (
    <div>
      <NavBar />
      <Routes>
        <Route path="/login" element={ <Login /> } />
        <Route path="/signup" element={ <Signup /> } />
        <Route path="/" element={ <Home /> } />
        <Route path="/map" element={ <PrivateRoute element={ <Map /> } /> } />
        <Route path="/donate" element={ <PrivateRoute element={ <DonateFood /> } /> } />
        <Route path="/recycle" element={ <PrivateRoute element={ <Recycle /> } /> } />
        <Route path="/donations" element={ <PrivateRoute element={ <MyDonations /> } /> } />
        <Route path="/requests" element={ <PrivateRoute element={ <RecycleRequests /> } /> } />

        <Route path="/admin/dashboard" element={ <PrivateRoute element={ <Dashboard /> }
        requiredRole="admin" /> } />
        <Route path="/admin/requests" element={ <PrivateRoute element={ <ManageRequests
        /> } requiredRole="admin" /> } />
      </Routes>
    </div>
  );
};
```

```
    <Route path="/admin/manage" element={<PrivateRoute element={<Manage />}
requiredRole="admin" />} />
```

```
    <Route path="/admin/viewplants" element={<PrivateRoute
element={<ViewBiogasPlants />} requiredRole="admin" />} />
```

```
    <Route path="/biogasplant/dashboard" element={<PrivateRoute
element={<BiogasPlantDashboard />} requiredRole="biogasplant" />} />
```

```
    <Route path="/biogasplant/requests" element={<PrivateRoute
element={<BiogasPlantRequests />} requiredRole="biogasplant" />} />
```

```
  </Routes>
```

```
</div>
```

```
);
```

```
};
```

```
const App = () => {
```

```
  return (
```

```
    <AuthProvider>
```

```
      <BrowserRouter>
```

```
        <RoutesComponent />
```

```
      </BrowserRouter>
```

```
    </AuthProvider>
```

```
  );
```

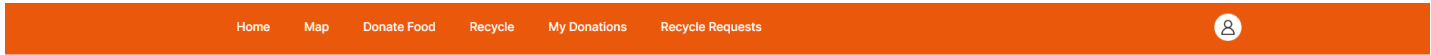
```
};
```

```
export default App;
```

CHAPTER 7

SCREEN SHOTS

USER INTERFACE



Hunger is not an issue of charity. It is an issue of justice. - Jacques Drouf

Donate Food

Latitude

13.0235087

Longitude

80.1888905

Street

Street address

City

City

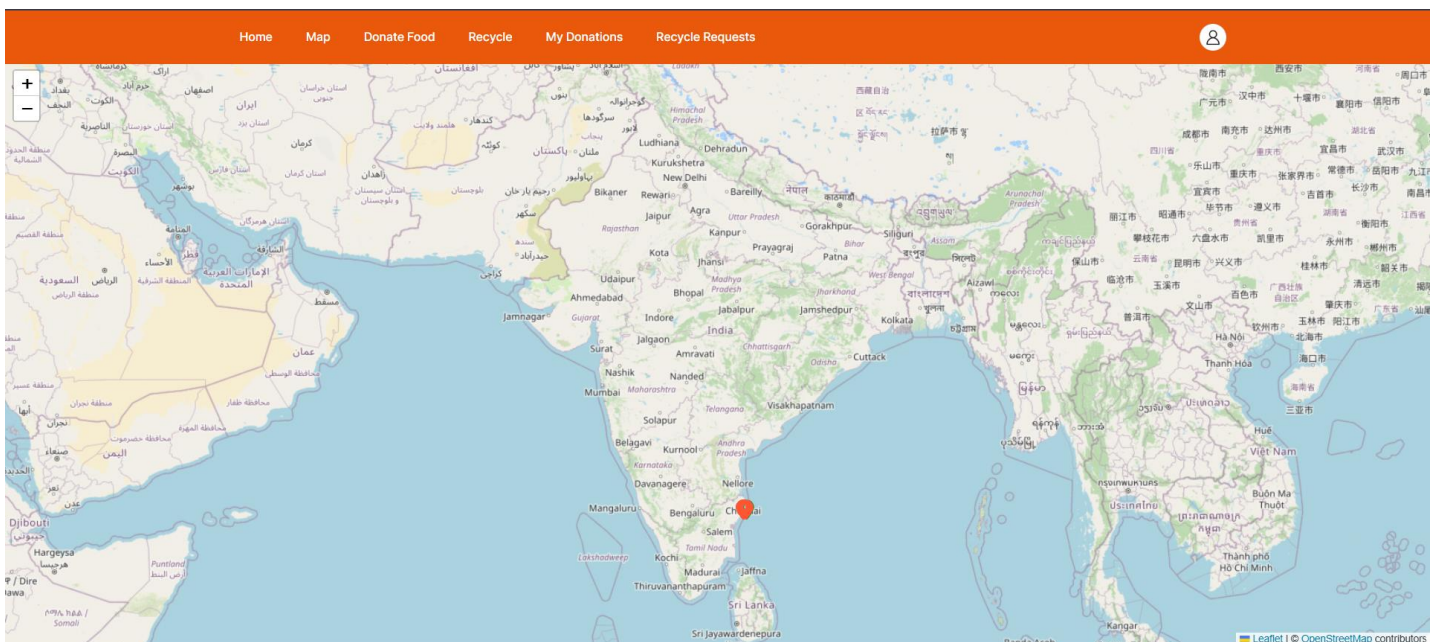
Pincode

Pincode

Type of Food

Select Food Type

Expiry Time



ADMIN INTERFACE

Dashboard

Year

2024



localhost:5173/admin/dashboard

| S.NO | USER | STREET | CITY | PINCODE | QUANTITY | DESCRIPTION | DELIVERY METHOD | BIOGAS PLANT | PICTURE | STATUS |
|------|------------|---------------|---------|---------|----------|-------------------------------------|-----------------|------------------------------|------------------------------|-------------------------|
| 1 | USR-899433 | Lakshmi Nagar | Chennai | 600093 | 2 | Garden waste | Drop-off | Green Energy Biogas | View Picture | <div>Acknowledged</div> |
| 2 | USR-531107 | Swathi Street | Chennai | 600045 | 5 | Food got wasted at a college event | Pickup | Green Energy Biogas | View Picture | <div>Accepted</div> |
| 3 | USR-531107 | Rajesh Street | Chennai | 600124 | 8 | Food got waste after marriage event | Drop-off | Sustainable Solutions Biogas | View Picture | <div>Rejected</div> |

localhost:5173/admin/requests

Add AdminAdd Biogas Plant

Add Admin

Admin Name

Enter admin name

Admin Email

Enter admin email

Admin Password

Enter admin password

Add Admin

localhost:5173/admin/manage

| Plant ID | Name | Status | Email | Contact Person | Phone | Street | City | State | Zip Code | Accepted Waste Types | Collection Methods | EDIT | DELETE |
|----------|------------------------------|--------|-----------------------------|----------------|------------|----------------|---------|------------|----------|---|--------------------|------|--------|
| BP000001 | Renewable Roots Biogas | active | rootsbiogas@gmail.com | Raj | 1478523695 | T.nagar | Chennai | Tamil Nadu | 600001 | Kitchen Waste Garden Waste Animal Manure Crop Residues Sewage Waste | Drop Off Pickup | | |
| BP000002 | Green Energy Biogas | active | greenenergy@gmail.com | Srinithi | 4567891256 | Serene Street | Chennai | Tamil Nadu | 600001 | Kitchen Waste Garden Waste Animal Manure | Drop Off | | |
| BP000003 | Sustainable Solutions Biogas | active | sustainablebiogas@gmail.com | Rithika | 4561238523 | Spencer Colony | Chennai | Tamil Nadu | 600001 | Kitchen Waste Garden Waste | Drop Off Pickup | | |


localhost:5173/admin/viewplants

BIOGAS PLANTS INTERFACE

Biogas Plant Dashboard

Year 2024



| DashboardManage Requests | | | | | | | | | |  | |
|--------------------------|------------|---------------|---------|---------|----------|-------------------------------------|-----------------|------------------------------|------------------------------|---|--|
| S.NO | USER | STREET | CITY | PINCODE | QUANTITY | DESCRIPTION | DELIVERY METHOD | BIOGAS PLANT | PICTURE | STATUS | |
| 1 | USR-531107 | Rajesh Street | Chennai | 600124 | 8 | Food got waste after marriage event | Drop-off | Sustainable Solutions Biogas | View Picture | Rejected | |

CHAPTER 8

CONCLUSION

The **Waste Management and Recycling System** developed for this project provides a comprehensive and efficient platform for managing food donations, recycling requests, and biogas plant operations. It simplifies the processes of event creation, request submission, and resource allocation, while ensuring role-based access for users, admins, and biogas plant operators.

The system offers an intuitive user interface that allows seamless navigation for users to donate food, request recycling services, and view real-time updates on an interactive map. The integration of role-based functionalities ensures that admins and biogas plant operators can manage tasks effectively.

The project has successfully met its initial objectives by providing a robust platform to address waste management challenges. This system is designed to reduce manual effort, promote environmental sustainability, and enhance community participation in food waste reduction and recycling efforts. In conclusion, the **Waste Management and Recycling System** acts as a crucial tool in streamlining waste management processes, promoting environmental responsibility, and encouraging efficient recycling practices among users, administrators, and biogas plant operators.

REFERENCES

- React and Node.js: www.reactjs.org, www.nodejs.org
- Firebase Authentication: firebase.google.com/docs/auth
- Leaflet Maps for React: react-leaflet.js.org
- Tailwind CSS: tailwindcss.com
- Shadcn UI Components: shadcn.dev
- PostgreSQL Database Management: www.postgresql.org
- SweetAlert2: sweetalert2.github.io
- Font Awesome Icons: fontawesome.com