

# EcoTrack: Turning Waste into Worth

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## 1. Project Overview :

- Objective: To minimize food waste by notifying users before food expiry, redistributing edible food, and directing non-edible waste to biogas plants and recycling industries.
- Target Users: Households, Restaurants, Supermarkets, Food Delivery Services, Recycling Industries, and Students (volunteers).

## 2. System Architecture :

### 2.1 High-Level System Flow

- 1. User Inputs Food Data: Users can scan barcodes or manually enter food details.
- 2. Expiry Alerts & Notifications: The system sends reminders 48 hours before expiration.
- 3. Decision Point:
  - If food is edible, users can donate it via integrated platforms like **Swiggy** or **Zomato**.
  - If food is non-edible, it is redirected to biogas plants or composting centers.
- 4. Plastic & Packaging Waste: Food packaging is collected separately and sent to recycling industries.
- 5. tracking & Reporting: Users can track donation, recycling, and impact metrics.

## 3. Features & Functionalities :

### 3.1 User Features

- Food Expiry Notifications– Alerts 48 hours before expiration.
- Barcode & Image-Based Food Tracking – Users can scan food barcodes or upload images to log items.
- Donation & Collection System–Connects users to food delivery apps for donation.
- Student Volunteer Program – Students can sign up for part-time participation.
- Gamification & Rewards – Incentives for donating or volunteering.

### 3.2 Admin & Industry Features

- Food Waste Collection Center Management– Tracks food donations and waste allocation.
- Industry Integration– Connects with biogas plants, recycling industries, and food banks.

- Analytics & Reports – Provides real-time data on food saved, waste managed, and environmental impact.

## 4. Technology Stack :

### Component -Technology Stack

- Frontend - Flutter (Dart)
- Backend - Node.js (Express)
- Database - Firebase / PostgreSQL
- Image Processing - OpenCV for food image analysis
- AI/ML - TensorFlow (for food spoilage detection, expiry prediction)
- Cloud Storage - AWS S3 / Firebase Storage
- API Integration - Swiggy, Zomato, Google Maps (for location-based donations)

## 5. Workflow & Integration :

### Step 1: Food Data Entry

- Users scan a barcode or enter food details manually.
- The system assigns an expiry date.

### Step 2: Notification System

- Push notifications are sent **48 hours before expiry** .

### Step 3: Action Based on Food Condition

- Edible Food → Sent to food banks via Swiggy/Zomato
- Non-Edible Food → Redirected to biogas plants, composting centers
- Packaging Waste → Sent to plastic recycling units

### Step 4: Incentives & Reporting

- Users earn points or rewards for donations.
- The app provides \*impact reports\* (e.g., CO2 reduction, meals donated).

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## **6. Industry Partnerships :**

### **Sector - Industry Partner (Example)**

- Food Donation-Swiggy, Zomato, Local NGOs
- Biogas/Biofuel- BPCL Biofuels, Indian Oil, Mahindra Waste-to-Energy
- Plastic Recycling-Bisleri's 'Bottles for Change', Recykal, Shakti Plastic Industries

## **7. Expected Outcomes & Benefits :**

- 30% reduction in food waste
- Millions of meals donated annually
- Increased student participation in sustainability projects
- Reduction in landfill waste & plastic pollution

## **8. Future Scope :**

- AI-powered food spoilage detection
- Blockchain for transparent food donations
- Expansion to rural areas & government integration

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