ICSRF 2025 HACKATHON

TEAM: EcoMatrix

PROJECT: EcoGram Bharat

1. Key Functions and Features

Our solution is an **AI-powered, map-centric rural waste management ecosystem** that unites communities, scrap collectors, and local authorities under one digital platform. The distinguishing elements are:

- **Centralized Map Layer (Core Hub):** Every reported activity—waste dump alerts, item listings, DIY reuse guides—is geo-tagged and visualized on a village-level map accessible to citizens, collectors, and officials. This ensures transparency, traceability, and quick action.

- **Landfill/Garbage Dump Reporting:**
  - Smartphone users capture photos, add optional notes, and upload reports with auto-detected locations.
  - Ordinary phone users simply dial a number; their calls are transcribed and analysed by AI agents (multilingual support included).
  - All reports appear instantly on the shared map for community and authority response.

- **Item Exchange / Circular Economy Module:**
  - Users can list unwanted items (with photo + location) for donation, resale, or reuse.
  - Interested community members can claim items directly; if unclaimed after a set period, scrap collectors are notified for pickup.
  - Ordinary phone users access the same via call-in voice interface.

- **DIY Reuse & Upcycling Assistant (Smartphone-exclusive):**
  - Users upload an image of a waste item. AI suggests reuse projects or DIY crafts with clear instructions and material lists.
  - Missing materials can be located via the central map, fostering local resource exchange.
  - Users upload proof of completed projects; AI verification ensures authenticity before awarding points.

- **Gamification & Incentives:**
  - Every eco-action (reporting waste, reusing, exchanging items) earns reward points.
  - Points accumulate into leaderboards, visible at the community level.
  - Redeemable for tangible benefits like ration shop concessions, farm input discounts, or welfare scheme priority.

Together, these features turn waste from a **liability into a community resource**, while motivating long-term participation through real rewards.

2. Typical Usage Scenarios

- **Households:** A rural mother sees a plastic pile. Instead of burning it, she reports it via smartphone, logging it on the community map. Scrap collectors and panchayat officials are notified for cleanup.

- **Youth and Students (Smartphone users):** Schoolchildren upload photos of discarded bottles, receive DIY planter instructions, and earn leaderboard points after verification.

- **Farmers:** A farmer checks the map and connects with a neighbor offering compostable waste, reducing input costs.

- **Scrap Collectors:** Instead of roaming, collectors consult the live map to locate recyclables, saving fuel and boosting income.

- **Elderly / Non-smartphone Users:** An elderly villager dials a number in his local language to report a garbage heap. He contributes effectively to waste reporting, though without gamification or leaderboard access.

- **Panchayat / Authorities:** Local leaders monitor waste hotspots via the dashboard, plan targeted cleanups, and track community progress.

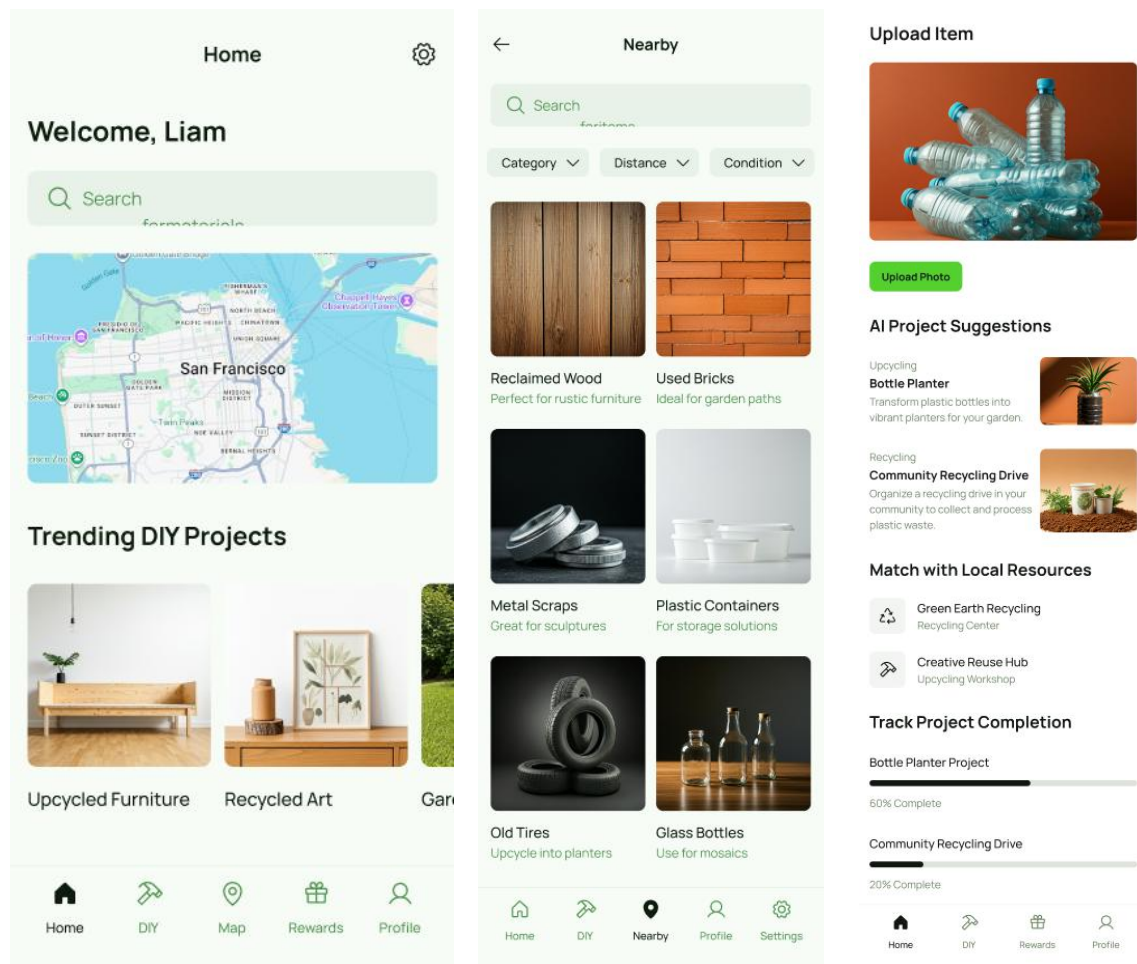This ensures smartphone users enjoy the full ecosystem (AI + gamification + DIY), while feature phone users still actively contribute through reporting and item exchange in an inclusive way.
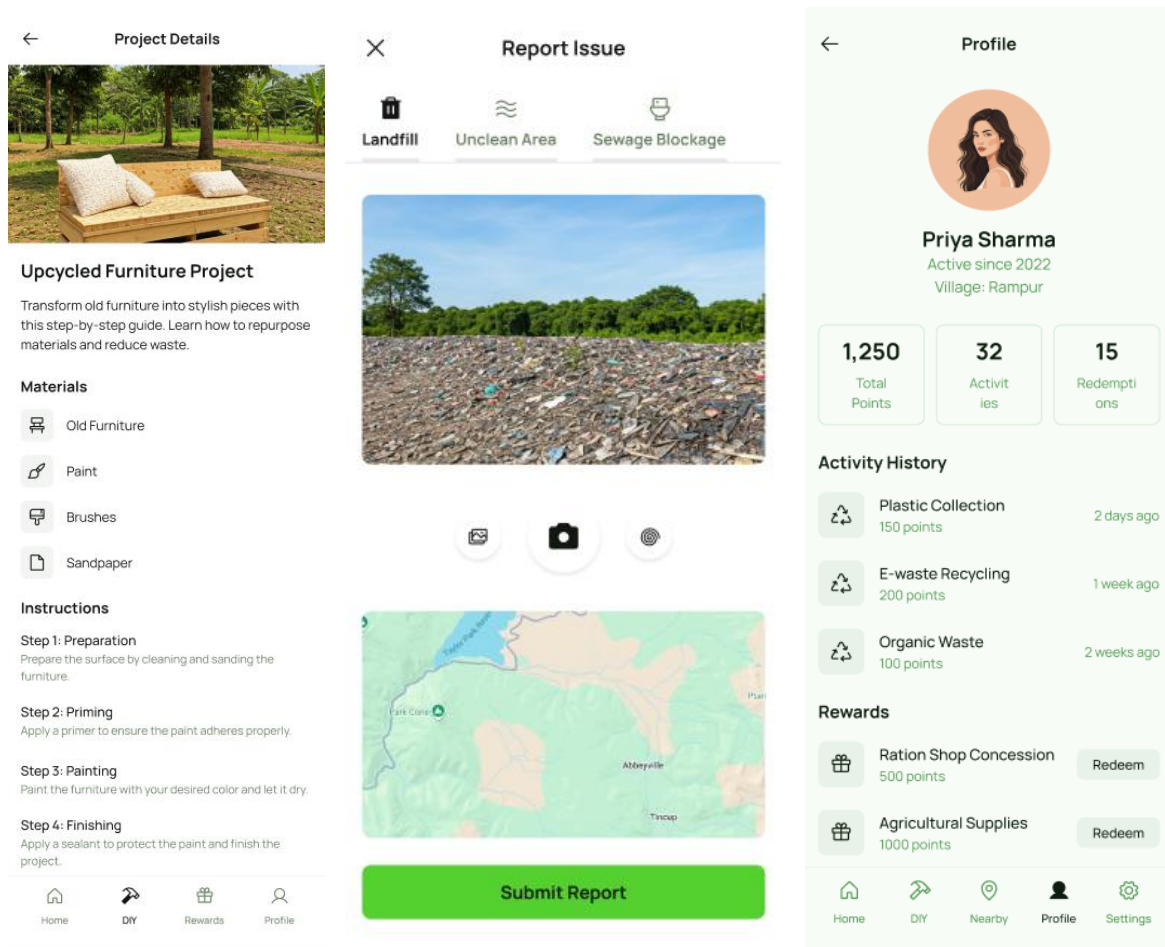
3. Current Progress & Mock-ups

For the frontend, we have finalized designs that prioritize user experience and accessibility. Several features have already been implemented using React Native, ensuring a smooth and intuitive interface.

On the backend, development is underway on the voice agent component, which forms the core of our solution. The agent has been successfully configured, and we are currently conducting latency tests to optimize performance.

For the material identification feature described in our earlier pipeline, we are leveraging a vision-language model from Hugging Face. This model accurately identifies materials and suggests creative reuse ideas. Our current focus is on integrating this functionality with the map and database systems to provide seamless end-to-end user interactions.

Project Details

Upcycled Furniture Project

Transform old furniture into stylish pieces with this step-by-step guide. Learn how to repurpose materials and reduce waste.

Materials

- Old Furniture
- Paint
- Brushes
- Sandpaper

Instructions

Step 1: Preparation
Prepare the surface by cleaning and sanding the furniture.

Step 2: Priming
Apply a primer to ensure the paint adheres properly.

Step 3: Painting
Paint the furniture with your desired color and let it dry.

Step 4: Finishing
Apply a sealant to protect the paint and finish the project.

Home   DIY   Rewards   Profile

Report Issue

Landfill   Unclean Area   Sewage Blockage

Submit Report

Profile

Priya Sharma
Active since 2022
Village: Rampur

1,250	32	15
Total Points	Activities	Redemptions

Activity History

Plastic Collection 150 points	2 days ago
E-waste Recycling 200 points	1 week ago
Organic Waste 100 points	2 weeks ago

Rewards

| Ration Shop Concession 500 points | Redeem |
| Agricultural Supplies 1000 points | Redeem |

Home   DIY   Nearby   Profile   Settings

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4. Hardware Components

Our solution is **fully software-based**. No additional hardware is required. Participation is enabled via:

- **Smartphones (full-feature access)** → AI vision, DIY guides, gamification, and leaderboards.

- **Ordinary phones (essential access)** → Voice-based reporting and item exchange (no gamification).

This makes the system **scalable, low-cost, and instantly deployable** without dependency on physical devices or IoT infrastructure.