🌍 EcoSnap: Citizen-Led Plastic Waste Reporting App

✅ Project Overview

EcoSnap is a cross-platform mobile app built using Flutter that empowers everyday citizens to fight plastic pollution. With just a few taps, users can:

Snap a photo of plastic waste.

Auto-tag its GPS location.

Add a quick note.

Submit the report to a centralized cloud database.

All submissions are displayed live on a map-based dashboard powered by Firebase and Google Maps, enabling NGOs, city cleaners, and environmental researchers to take real-time action.

Goal: Turn every smartphone into a powerful reporting tool for plastic pollution, transforming civic participation into environmental impact.

🎯 Problem Statement

Plastic waste often goes unreported and ignored. Authorities, NGOs, and research bodies lack reliable data on its location and scale. EcoSnap aims to solve this through a decentralized, citizen-driven approach.

Objectives:

Create environmental awareness through participation.

Build an open platform for plastic waste reporting.

Assist municipalities and NGOs with crowdsourced data.

🔧 Tech Stack

Component	Tool/Platform
Frontend (Mobile)	Flutter
Location Services	Google Maps API
Storage	Firebase Cloud Firestore
Image Storage	Firebase Cloud Storage
Authentication (optional)	Firebase Auth (email/anon)
Admin Dashboard	Could be a simple Flutter Web, React, or Streamlit app

📱 App Features (MVP)

👤 User Side:

Photo Capture - Upload or snap a picture of visible plastic waste.

GPS Location Tagging - Auto-detect and embed current GPS location.

Add Note - Optional comment describing the waste.

Submit Report - Sends metadata to Firestore and image to Storage.

Success Screen - Confirmation message and share option.

🗺️ Admin Side (Optional):

Live map view of reports.

Filter by date, area.

Export to CSV for research or municipal action.

📊 Firestore Data Structure

```
/reports (collection)
  └─ reportID (doc)
      ├─ imageUrl: string
      ├─ lat: double
      ├─ lng: double
      ├─ note: string
      ├─ timestamp: DateTime
      └─ userId: string (optional)
```

🔬 Architecture & Workflow

User Workflow:
Snap Photo → Auto-fetch GPS → Add Note → Submit Report

Backend Flow:
Firebase Storage (photo) + Firestore (metadata) → Admin dashboard visualizes in real time.

✏️ UI Flow

Page

Features

Home Page

Title, Capture Waste button

Capture

Camera/Image picker, Map preview

Details

Add optional note, Submit button

Success

Thank You message, Social Share option

⏱️ 8-Hour Hackathon Plan

Time Slot

Task

0–1 hr

Firebase setup, security rules

1–3 hr

Flutter UI (Camera, Forms, Map)

3–4 hr

Firestore + Storage integration

4–5 hr

Test complete submission flow

5–6 hr

(Optional) Build admin dashboard

6–7 hr

UI polish, add snackbars and validation

7–8 hr

Final testing, prepare demo, slides

🚀 Tips to Impress Judges

Live Demo: Show a real report being submitted on-site.

Map Dashboard: Display multiple live submissions.

Vision Pitch: Talk about city-scale, SSIP, NGO partnerships.

Gamification Angle: Future addition of points, badges.

Research Value: Exportable data for policy analysis.

🚀 Future Enhancements

Feature

Impact

AI-based Waste Classifier

Detect type of plastic from image

Rewards System

Points/leaderboards to engage users

Language Support

Regional language accessibility

Municipal Alerts

Notify local cleaning services directly

Open API

Allow NGOs to access and use collected data

🤝 Final Words

EcoSnap turns passive observation into environmental action. It’s a scalable, community-powered solution that bridges everyday tech and sustainability. Perfect for civic hackathons and a real-world impact story in the making.

Slogan: "Snap the Waste. Save the Planet."

Help the planet? Let's build EcoSnap! 🌿📱🌍