

# MangroveGuard: AI-Powered Participatory Monitoring

Mangroves: natural barriers, biodiversity hubs, carbon sinks.

Threatened by illegal cutting, land reclamation, pollution.

Government monitoring alone is not enough.

# Our Solution: Community-Powered Protection



## Locals Module

Upload geotagged photo/video or voice SMS.



## NGO/Police Module

Real-time alerts, incident dashboard.

AI-assisted validation for 95%+ accuracy.

Gamification for engagement and recognition.

# What Makes MangroveGuard Unique?

## **Citizen-Powered**

Beyond government alerts; bottom-up approach.

## **Multi-Channel Reporting**

Smartphone, keypad phone (SMS/voice), offline sync.

## **Accuracy-Focused**

3-layer validation (AI + GPS + crowd check).

## **Inclusive Design**

Accessible for tribal and local communities.

# Accuracy Pipeline: The MVP Core

01

## AI Content Check

Image detection (mangroves, cutting tools), audio recognition (chainsaw sounds).

02

## Geo Validation

GPS auto-captured, cross-checked with mangrove GIS zones.

03

## Crowd & Authority Check

Multiple reports, NGO verification loop. Reports get a **Confidence Score**.

Only High Confidence reports sent instantly.

# System Architecture



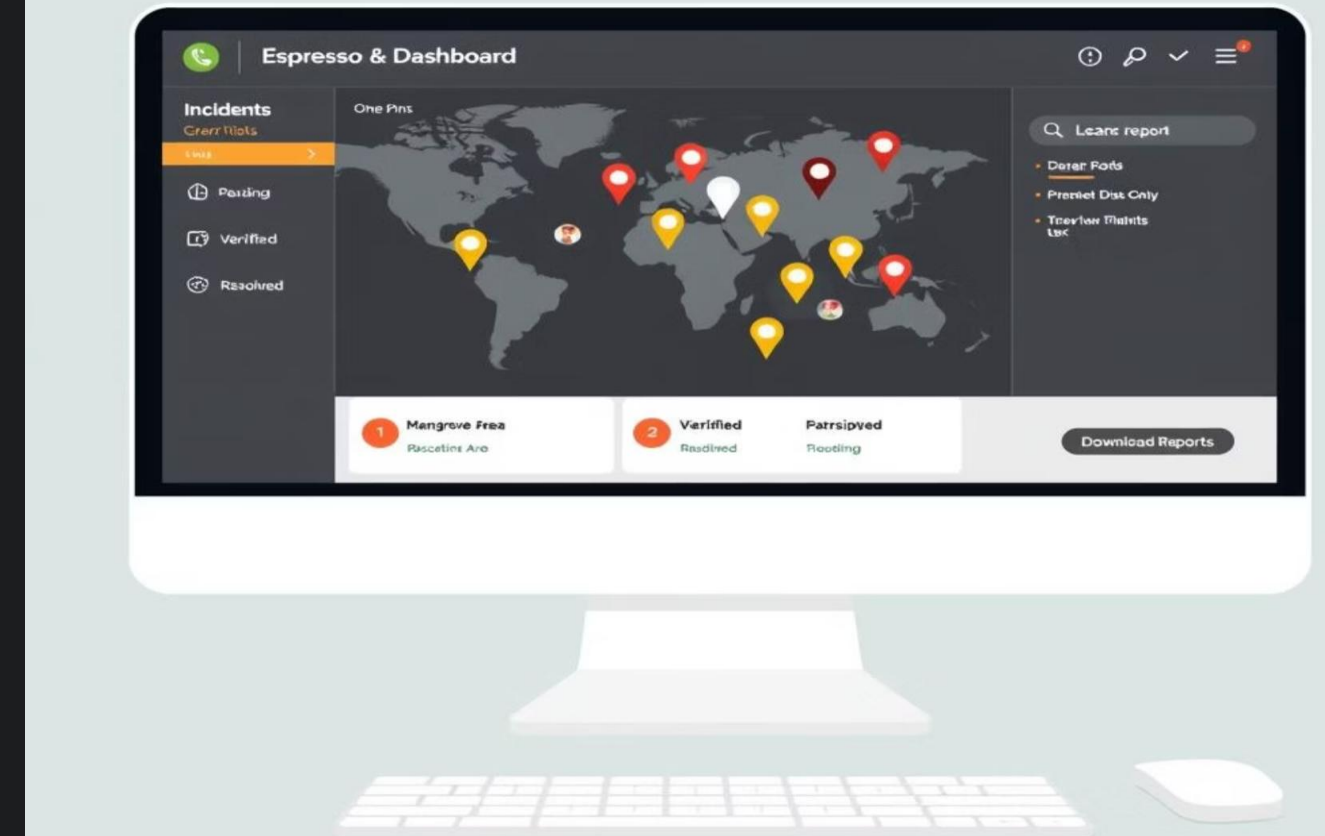
Seamless flow from community report to decisive action.

# Intuitive UI/UX Design



## Locals App

- One-tap reporting (photo capture, auto GPS, send).
- Icon-driven, local language, offline mode.



## NGO Dashboard

- Map view with live incident pins 📍.
- Incident status tracking.
- Downloadable reports for legal action.

# Gamification & Engagement



## Points System

Earn 🌱 for verified reports.



## Badges

"Mangrove Protector," "Eco Warrior" 🏆



## Leaderboards

Village-wise recognition.



## Community Rewards

Certificates, NGO rewards, local events.

# Robust Tech Stack

## Frontend

React Native (App) React + Tailwind (Dashboard)

## Backend

Node.js + MongoDB

## AI Models

YOLOv5 (Image) CNN (Audio) GPS Cross-Check

## Maps & Integration

Mapbox/Leaflet SMS/IVR for basic phones

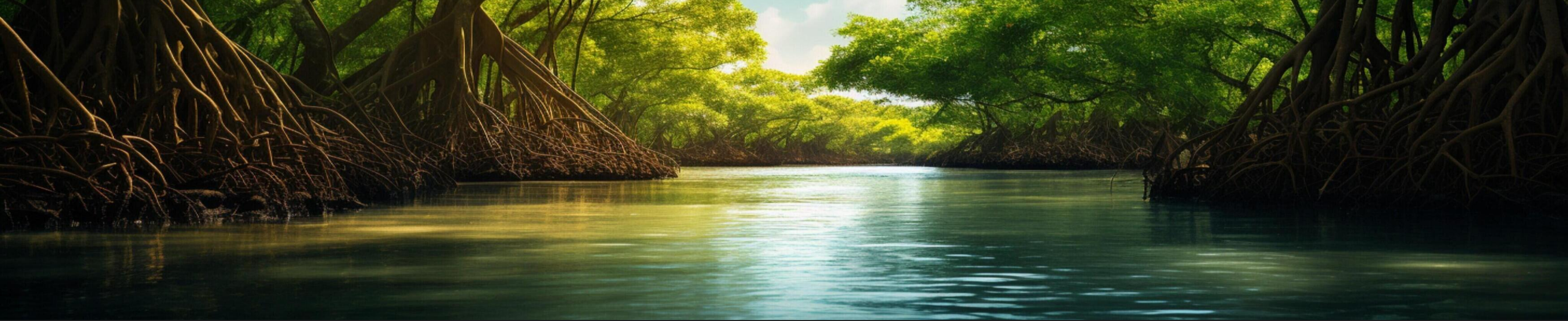


# Impact & Scalability



- Protects mangroves: biodiversity, storm protection, carbon storage.
- Empowers locals & tribals: ownership in conservation.
- Scalable: adapt for forests, rivers, wildlife.
- Future scope: Drones, IoT sensors, carbon credit tracking.





# MangroveGuard: The Future of Conservation

"Turning every villager into a guardian of nature with AI accuracy & community power."

## Real-World Problem

Solved with innovation.

## Accurate Validation

95%+ precision.

## Inclusive & Scalable

For all communities.