



# AI Crop Insurance Agent

Autonomous weather monitoring. ML disaster detection. Automatic blockchain payouts.

## The Problem

# 500M farmers have zero crop insurance



### Slow Claims

Traditional insurance takes weeks to months to process payouts after a disaster



### Too Expensive

Premiums are unaffordable for smallholder farmers earning < \$2/day

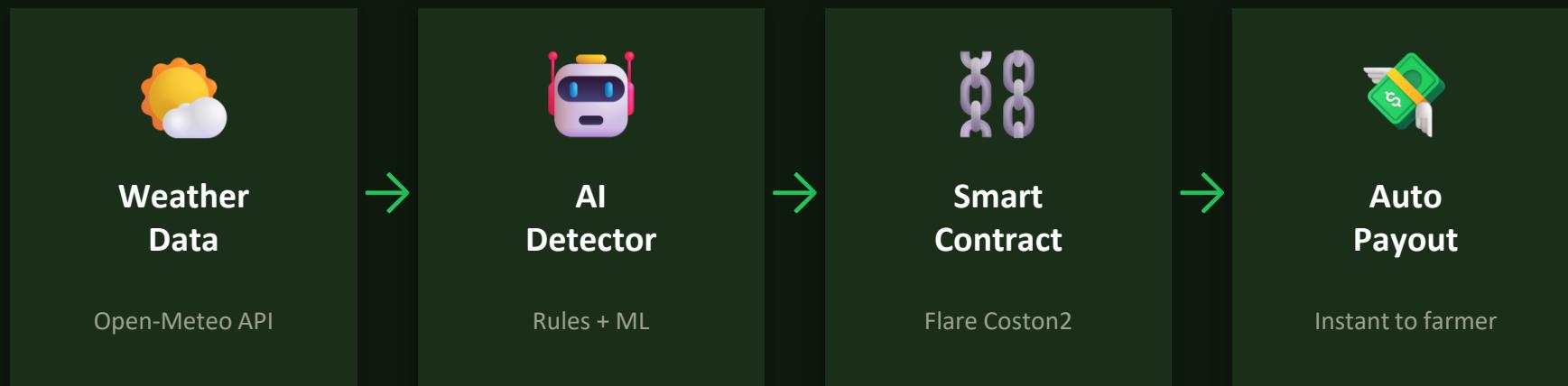


### Manual Process

Requires adjusters to physically visit farms, making it impractical at scale

## The Solution

# An AI agent that watches weather and pays farmers automatically



*Agent runs 24/7 — no human intervention needed*

# Ensemble: both detectors must agree



## Rule-Based Detector

- Drought: < 2mm rain over 10 days
- Flood: > 50mm current rainfall
- Frost: Temperature < 2°C
- Heat Wave: Temperature > 45°C



## Isolation Forest (ML)

- Trains on 14 days of history
- Features: temp, rain, wind speed
- Flags statistical anomalies
- scikit-learn, 100 estimators

Both agree → disaster declared → payout triggered. Reduces false positives significantly.

## Live Demo

# Watch the agent detect a disaster in real time

- 1 Dashboard shows live weather** Real-time temp, rainfall, humidity, wind for Nairobi
- 2 AI runs assessment** Rule-based detector + Isolation Forest both analyze conditions
- 3 Simulate drought** Click button → AI flags disaster → both detectors agree
- 4 Blockchain payout** Smart contract auto-sends C2FLR to insured farmer on Flare  
**[ SWITCH TO STREAMLIT DASHBOARD FOR LIVE DEMO ]**

## Why Flare?

# Built for exactly this use case



### FDC (Data Connector)

Brings verified external data (weather APIs) on-chain with cryptographic proofs — no trusted middleman



### FTSO (Price Feeds)

Native decentralized price oracle for denominating insurance policies in USD



### Fast & Cheap

Coston2 testnet deploys in seconds, transactions cost fractions of a cent



### Real-World Data Focus

Flare is the blockchain designed for connecting real-world data to smart contracts

## Tech Stack



### Weather Data

Open-Meteo API (free, no key)



### ML / AI

scikit-learn Isolation Forest + rule engine



### Smart Contract

Solidity ^0.8.20 on Flare Coston2



### Agent

Python + web3.py (autonomous loop)



### Dashboard

Streamlit + Plotly (real-time charts)



### Deployment

Hardhat + TypeScript



# AI Crop Insurance Agent

Protecting farmers with AI + blockchain — no paperwork, no delays, no middlemen.

## Next Steps

- FDC integration for cryptographically verified weather data on-chain
- FTSO price feeds for USD-denominated policies
- LSTM time-series forecasting for early warning predictions