**Terra Farmers** is a unified digital ecosystem designed to *empower farmers* with end-to-end tools for planning, monitoring, protecting, and selling their crops —sustainably and independently.

Built with AI, real-time data, and a *farmer-first approach*, Terra Farmers addresses key pain points in small to mid-scale agriculture through ***five interconnected services***:

**1. Smart Crop Recommendation**

Farmers input location, climate, soil type, land availability, and crop preferences. Using a rules-based engine with optional AI enhancement, the platform *recommends optimal crops* based on regional suitability. Each suggestion includes yield time, resource needs, and eco-practices. Selections feed directly into the crop growth tracker.

**2. Crop Growth Tracker**

A lifecycle tracker for each planted crop offering weekly insights like expected growth, water needs, harvest time, and sustainable packaging practices. Farmers receive *timely, stage-based care guidance* based on crop-specific data.

**3. Farm Dashboard**

A personalized dashboard *visualizes key metrics* such as:

* Number of crops currently tracked
* Estimated yield timelines
* Water usage trends
* Disease alerts & planting timelines

Built using lightweight visualization libraries (Chart.js / Recharts), the dashboard helps farmers make data-driven decisions quickly.

**4. Leaf Disease Detection**

An *AI-powered diagnosis* tool that identifies plant diseases from uploaded leaf images. If the system fails or the user wants assistance, the platform enables connection to *human experts*. Follow-up includes treatment suggestions with an emphasis on *organic solutions*.

**5. Verified Farmer Marketplace**

Verified farmers can list crops for direct sale. ***Verification*** is either automatic via crop tracking or manual through documentation.

Buyers can browse organic produce, view seller growth history, and message farmers directly to arrange sales — enabling transparent, commission-free trade.

**Government Schemes & Subsidy Information**

A dedicated section curates the latest agriculture-related schemes, subsidies, and certifications available by country or region. It helps farmers discover available financial support and understand eligibility and application steps, all in local languages if needed.

**Ecosystem Integration**

Terra Farmers works as a cohesive system:

* Crop planning flows into tracking
* Tracking enables marketplace participation
* Disease alerts connect to dashboard insights
* Dashboard + subsidy info = smarter, funded farming

**Technology Stack**

* Frontend: React.js + Tailwind CSS
* Backend: Node.js + Express
* AI Services: Python (Flask / FastAPI)
* Database: MongoDB / Firebase
* Visuals: Chart.js / Recharts
* Chat +Storage: Firebase Realtime DB, Cloudinary
* APIs: OpenWeatherMap (for weather alerts), government agri APIs (if available)

**Impact**

Terra Farmers gives *small farmers* access to tools typically reserved for industrial agriculture — enabling them to make better decisions, reduce crop losses, and access buyers and subsidies with ease.

The platform promotes sustainability, food security, and economic independence — aligned with real-world farming needs and government development goals.