

TEAM EAST



AgroScope

Innovating Agriculture for a Sustainable Future

AgroScope is a platform that identifies, categorizes, and connects farm waste to the right industries at zero cost to farmers. We turn agricultural residue into profit while powering startups with sustainable resources.

PROBLEM STATEMENT

Every year, India produces massive amounts of crop residue, but without proper disposal and market access, this valuable resource is wasted - hurting farmers, the environment, and the economy.

Farmer's Burden

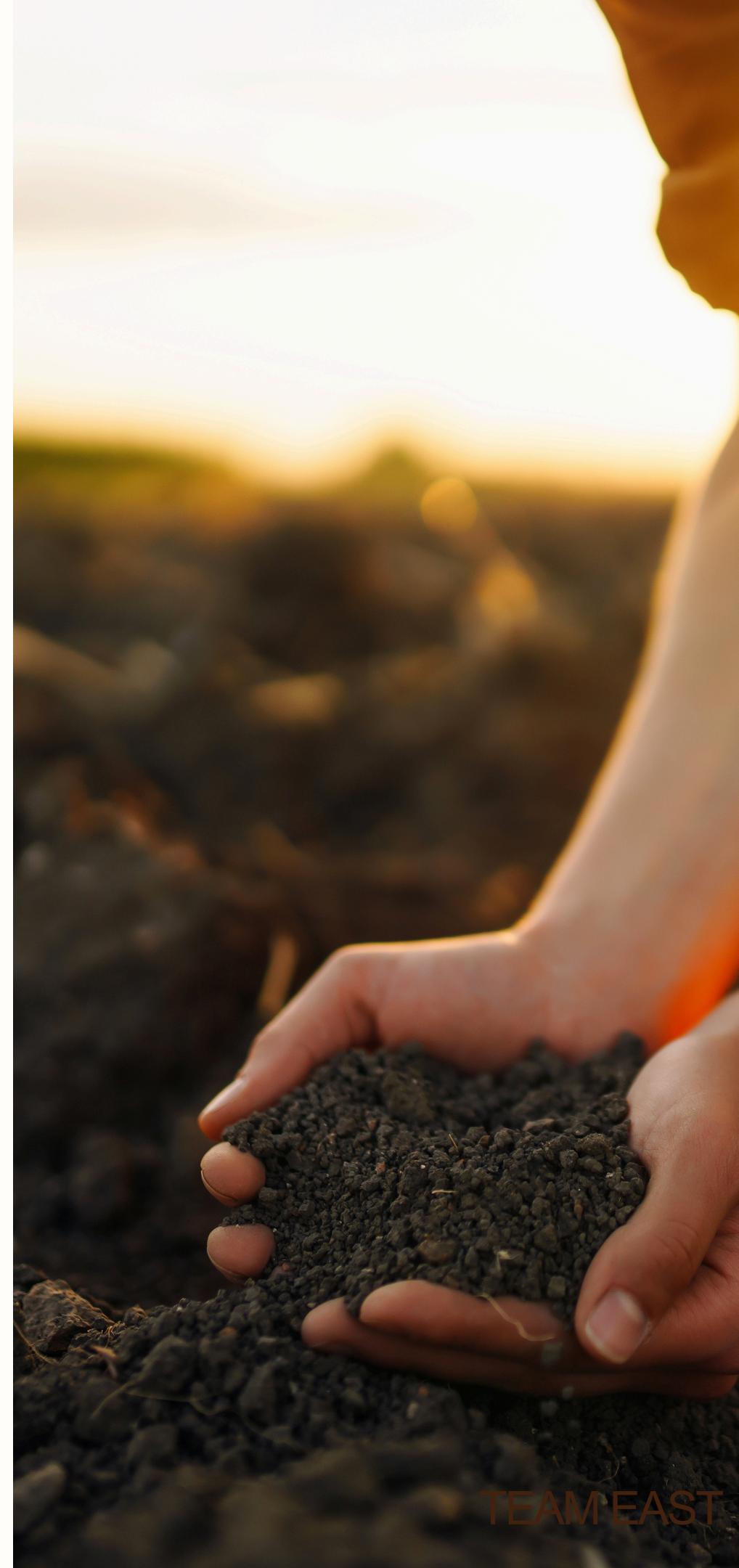
- **500 million tonnes** of residue produced yearly
- **92 million tonnes** burnt due to lack of buyers
- Lost income and disposal challenges

Environmental Crisis

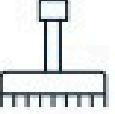
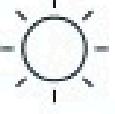
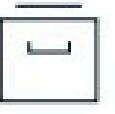
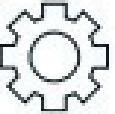
- Burning causes severe air pollution (PM2.5)
- Leads to **44,000–98,000 premature deaths** annually
- Damages soil and increases carbon emissions.

Market Inefficiency

- Industries need sustainable raw materials
- No direct platform connecting farmers and buyers
- Result: wasted value + supply gap.



PostHarvest losses

Value chain step	What causes losses at this stage?	Magnitude of losses for selected grains and regions, percentages up to
 Harvesting	Poor harvest timing (crop harvested before fully mature or when moisture content is too high)	 8 In areas of sub-Saharan Africa
 Threshing	Grain spillage, incomplete separation of grain from chaff, grain breakage, or moisture	 3 Maize threshing losses in areas of Africa
 Drying	Grain exposed to birds and insects, damage from rain, or contamination from dirt and insects	 3 0.4% with machine drying; 3.1% with open-sun drying (Bangladesh) ¹
 Storage	Exposure to pests, temperature variation, and moisture (leading to mycotoxin formation)	 40 1% in well-controlled environments; 40% in humid tropical conditions for maize ²
 Processing	Cracked kernels, introduction of foreign matter, and high moisture	 30 Losses of 5 to 30% depending on milling type (village milling or commercial milling)
 Transport	Spillage due to low-quality bags	 2.5 Up to 2.5% for cereals in Southeast Asia ³
 Marketing	The process of removing crops from the field	 2.5 Up to 2.5% if grain stored in poor conditions at the market in sub-Saharan Africa ⁴

Proposed Solution

We are building a web platform with an admin dashboard that connects farmers and startups. Farmers upload crop waste details, startups submit material requests, and the admin reviews and approves them. The system then maps and matches both sides, turning farm waste into profit while promoting sustainable reuse.



Farmer Input

Farmers can select the type of crop from the drop-down menu and provide a short description and upload the quantity of waste material which will make it easier to use the application



The Match

The system categorizes the crops into pre-defined types and recommends eco-products, local startups, or potential bulk buyers that can repurpose that exact material, complete with an estimated price range.



Proximity Focus

Integration of Google Maps API enables localized matches, minimizing transport costs and emissions.

Pillars

INNOVATION AND PRODUCT THINKING

The platform transforms agricultural waste into opportunity through transparent B2B links. With user-focused design and data-driven insights, it enhances efficiency, sustainability, and value creation for both farmers and industrial buyers.

WEB DEVELOPMENT

Built using the MERN stack—MongoDB, Express, React, and Node.js—the platform ensures scalability, speed, and seamless integration. MongoDB Atlas enables secure cloud storage, while React provides a responsive, real-time interface for smooth user interaction.

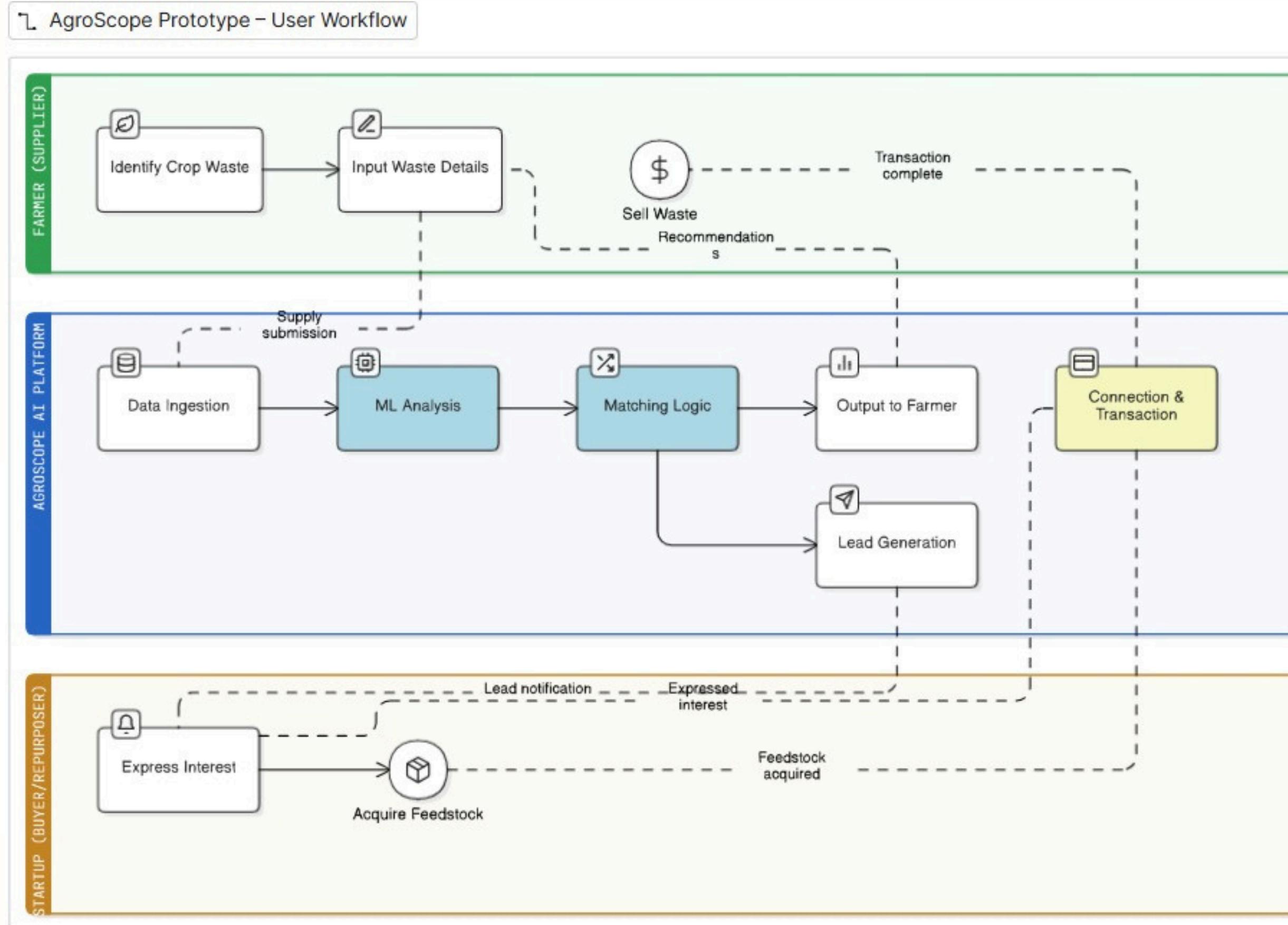
AI/ML

AI and machine learning automate key platform functions. The crop classification model identifies waste types, while the matchmaking engine predicts ideal farmer-buyer matches using Python and TensorFlow for accurate, data-driven, and sustainable decision-making.

CYBERSECURITY

The platform ensures security through JWT authentication, role-based access, and encrypted communication. MongoDB validation and Express middleware prevent attacks, while bcrypt and SSL safeguard data integrity, ensuring safe, reliable, and trusted transactions.

User workflow



TechStack

FRONTEND:

- HTML
- Tailwind CSS
- React

BACKEND:

- Node.js
- Mongodb
- MySql

Infrastructure:

- Github Actions (CI/CD)
- Docker
- Kubernetes

API's:

- Google Maps JavaScript API
- Geocoding API
- Stripe API



Why Choose AgroScope

Zero-cost model: Farmers earn from waste crops at no expense.

Reliable supply chain: Contract-based farmer network ensures consistent availability.

Patented sourcing system: Guarantees traceability and prevents duplication.

No inventory costs: Maximizes profit with minimal operational expense.

Sustainability-driven: Reduces crop burning and supports ESG goals.

Mutual benefit: Farmers gain income, companies get sustainable raw material.

Who are our Clients?



Takachar – Converts agricultural residue and crop waste into biofuels and biochar using portable, low-cost technology.

Punjab Renewable Energy Systems Pvt. Ltd. (PRESPL)
Aggregates and supplies agricultural biomass for renewable energy and industrial fuel use.

Bluecat Paper – Produces sustainable paper and packaging from agricultural residue instead of cutting trees.

Green Joules – Manufactures drop-in biofuels from agricultural and industrial waste for commercial and industrial use.

Revenue Model

Farmers: Our service is **FREE**, permanently. This crucial decision ensures we meet our social mission of supporting rural communities and drives maximum platform adoption. By removing the cost barrier, we guarantee a consistent, widespread supply of high-value waste materials, which is the foundational asset of the platform.

Startups/Buyers: This group is our primary revenue source, paying for guaranteed access to supply. We employ a ***Commission/Transaction Cut model***, taking a small percentage of the total transaction value when a match leads to a sale. This ensures our revenue scales directly with the platform's utility and the success of the circular economy we facilitate.

Value Proposition for Buyers: Startups and industrial buyers pay us because AgroScope removes their biggest sourcing challenges through verified, geo-localized feedstock leads. By matching them to the nearest suppliers via Google Maps API, we cut logistics and transport costs drastically. Our small commission delivers major savings, supply reliability, and efficiency making it a clear win for buyers.

Conclusion

AgroScope reimagines agricultural waste - turning a global challenge into local economic opportunity. We're not just addressing waste; we're empowering rural communities to create decentralized wealth and sustainable growth. With your support, we can scale this prototype into a platform that ensures every piece of crop residue adds value and makes a difference.

Thank You!