



Enhancing Rice Traceability and Authenticity: A Digital Approach with Field Data and QR Code Integration

TRACING RICE AND VALORIZING SIDE STREAMS ALONG
MEDITERRANEAN BLOCKCHAIN

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Objective & Approach



Develop and implement a **digital traceability system** linking **field data** to end-consumers through **QR code** technology.

- App for field data record
- Provide consumers with reliable, real-time information on product origin and farming practices.

1 The Importance of Rice Traceability and Authenticity

2 Regulatory Context (CAP)

3 Our Digital Solution: A Field Data Recording App

4 Key Features of the App

5 QR Code Integration for Enhanced Traceability

6 Pilot Study: Field Data Collection in 2023 Harvest

7 Scaling Up: 2024 Harvest Caravela Rice Field Data

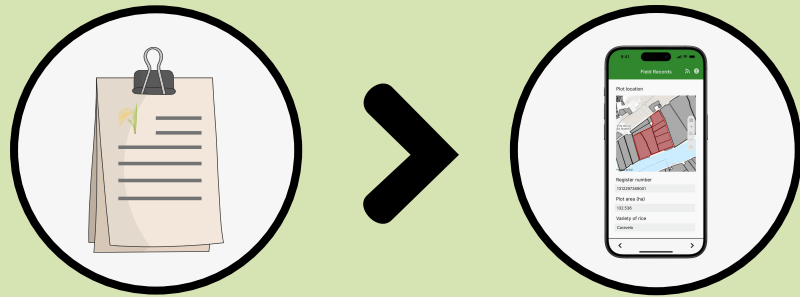
8 Future Directions/ Blockchain Integration for Data Security

The Importance of Rice Traceability and Authenticity



- Rice is one of the most important food crops worldwide;
- Given its scale of production and crucial role in diets, it is essential to establish robust **traceability systems**. These systems ensure **food safety**, promote **sustainable agricultural practices**, and address the **growing consumer demand for transparency**.

Regulatory Context (CAP)



The European Union's **Common Agricultural Policy (CAP)** for 2023-2027 emphasizes:

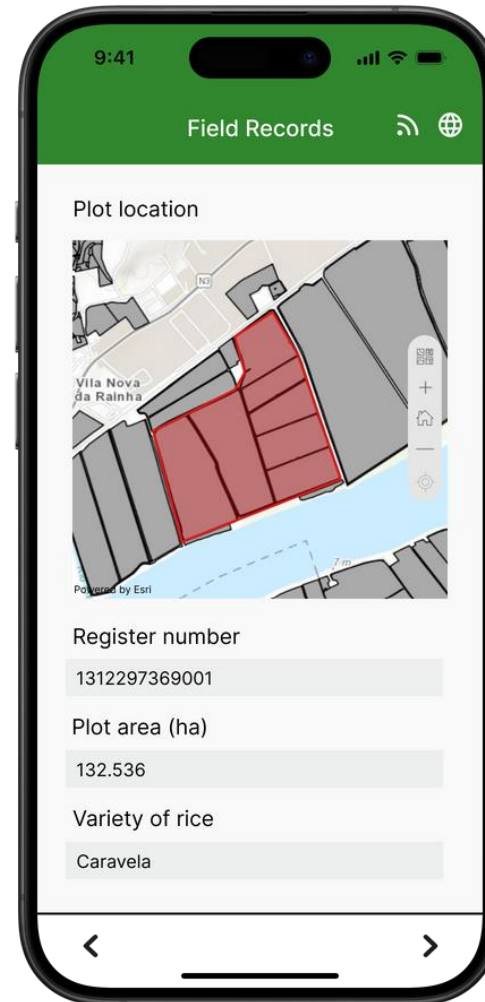
- 1 **Product differentiation** based on quality;
- 2 **Transparency** in food origin;
- 3 **Clarity** in transactions and actors along the supply chain.

A key regulation is the mandatory **Digital Farm Book** for farmers receiving specific subsidies (e.g. for implementing integrated production), ensuring detailed record-keeping and compliance with agricultural practices.

Our Digital Solution: A Field Data Recording App

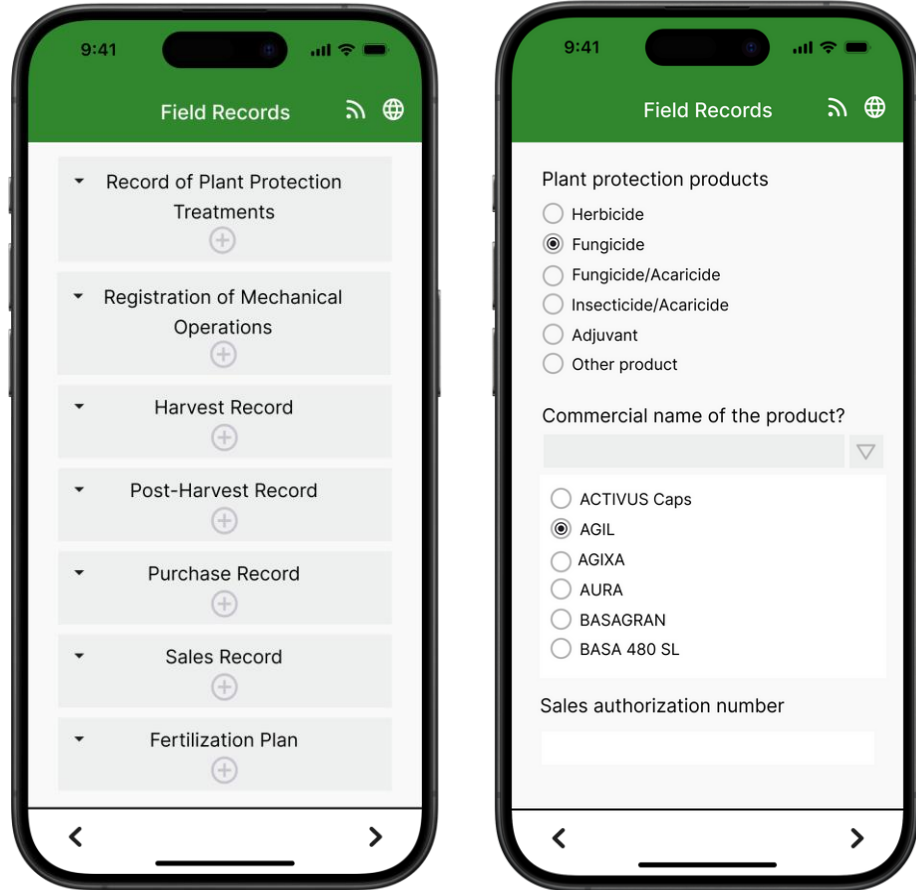
Mobile App for recording field data in integrated rice production.

Built using **ArcGIS Survey123**, a Geographic Information System (GIS) software.



It is user-friendly, compatible with both **Android** and **iOS** devices.

Key Features of the App



➤ **Comprehensive data collection;**
Geographic location, crop phenological stage, plant protection treatments, fertilization, mechanical operations, and harvest dates in accordance with Integrated Production principles and CAP regulations.

➤ **Simplified registration;**
Pre-loaded forms ease data entry
- Integration of a rice plot database created in ArcGIS, utilizing data from farmers' registrations within the payment authority (IFAP in the Portuguese version).

➤ **Offline functionality.**
Ensures data can be recorded in remote locations without internet access

Expanding Usability



Available in multiple languages, including **Portuguese, English, Spanish, and Arabic.**



Supports rice production in Portugal, Spain, Egypt, and beyond.



Waiting approval to publish the survey app template as **open access** on the **ArcGIS Survey123** platform.

Detailed Reports for Stakeholders

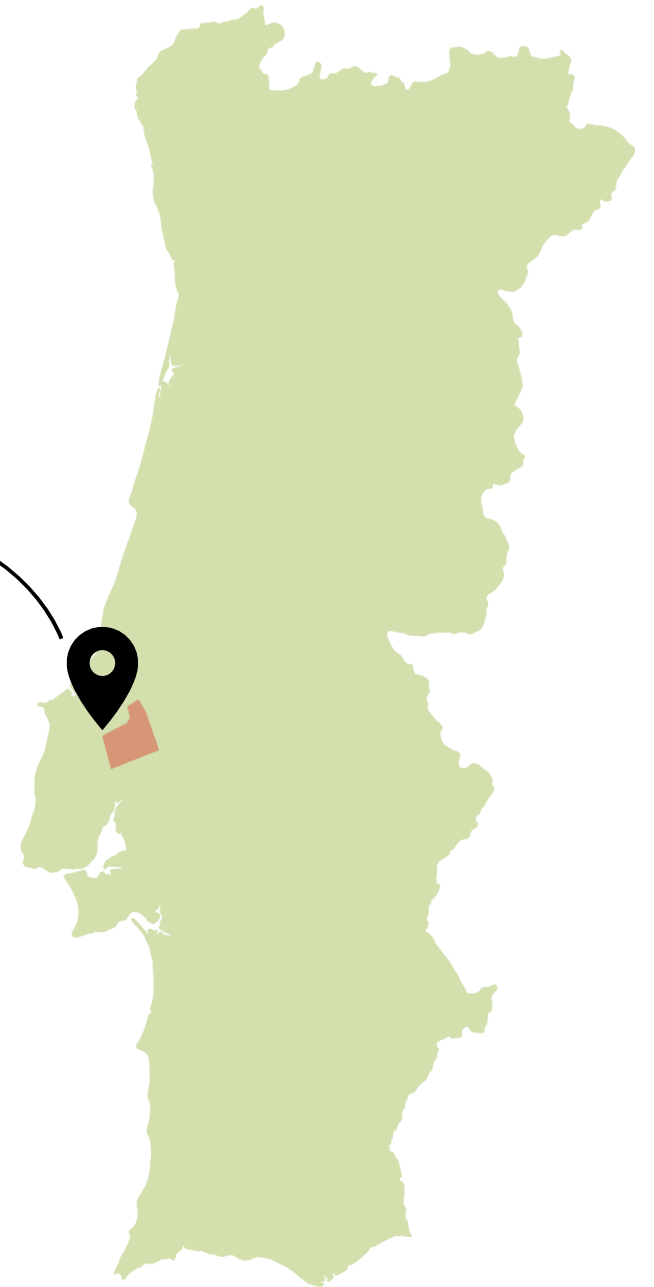
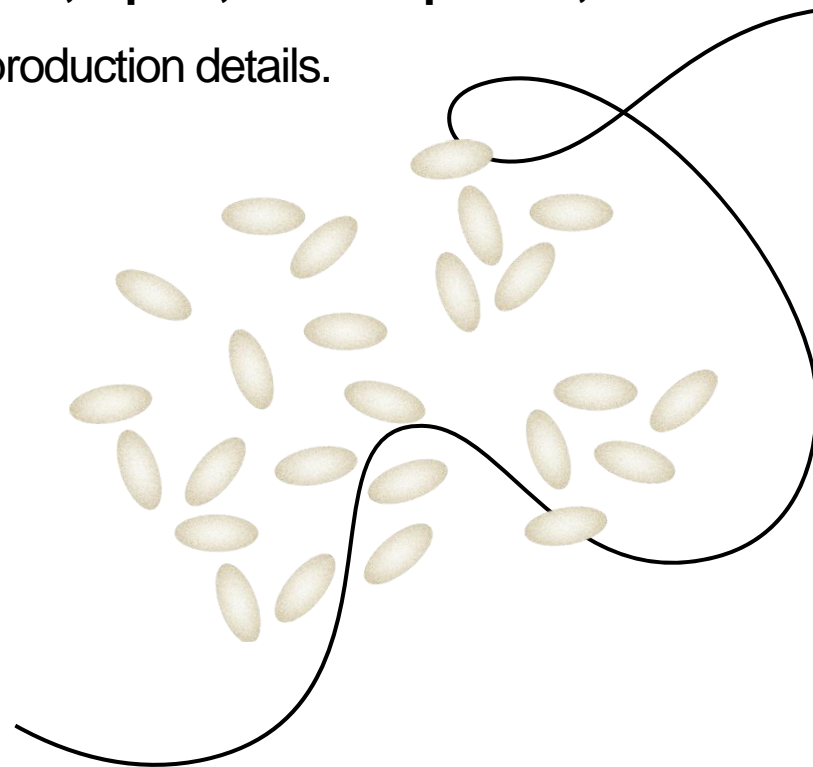
The app generates detailed reports that can be used by stakeholders across the rice production chain.

- Chronological view of all activities;
- Crucial for auditing and regulatory compliance;



QR Code Integration for Enhanced Traceability

- Unique **QR codes** for each rice batch;
- Holds information on **farm location, inputs, and compliance;**
- Consumers scan to access full production details.



Pilot Study: Field Data Collection in 2023 Harvest

- A rice plot in Mondego, acquired by **Ernesto Morgado**, was selected.
- Field data was imported into the app, and a **unique QR code** was generated for each rice package linked to that **specific field**;
- **Full traceability** allowing consumers to access detailed information about how that rice was grown.

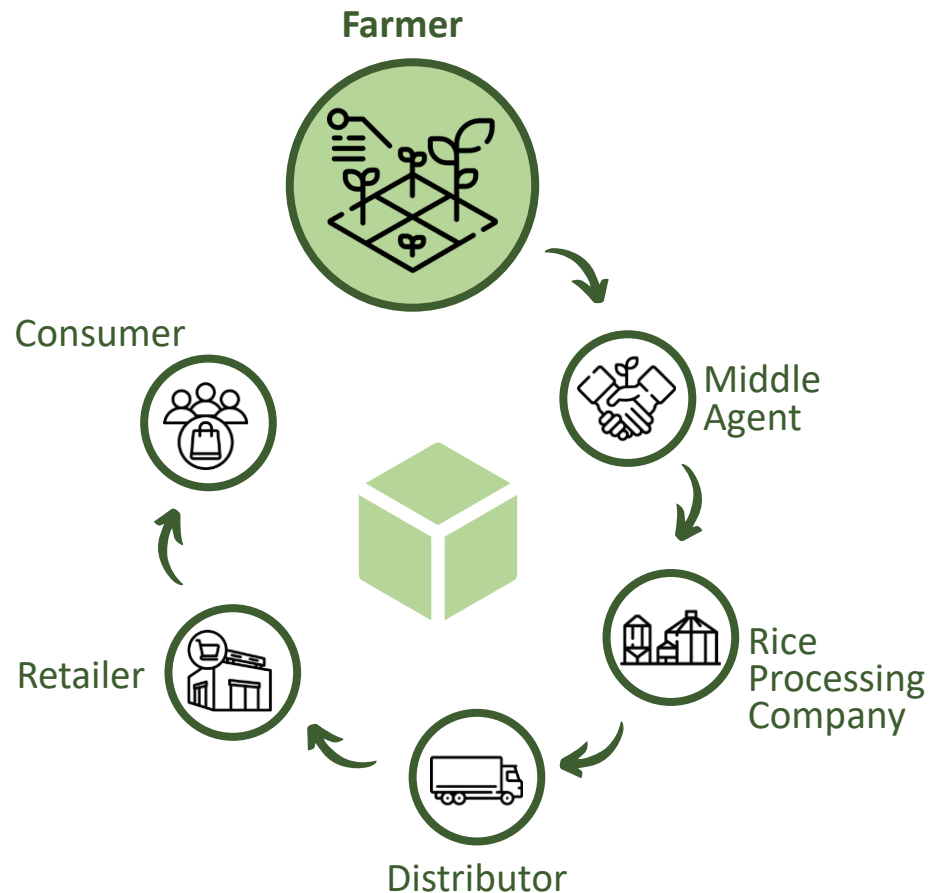


Scaling Up: 2024 Harvest Caravela Rice Field Data

- We monitored 3 plots in Mondego of **Caravela rice**, collecting detailed field data;
- **Future Work:** In addition to traceability, we aim to analyze the relationship between field data variables and rice quality parameters. This research will provide insights into how specific field conditions impact the final product quality, supporting more informed and optimized production decisions.



Future Directions/ Blockchain Integration for Data Security



Potential integration of blockchain technology.

- Ensure **data security** and **immutability** throughout the supply chain;
- **Blockchain** offers a tamper-proof solution, safeguarding against data manipulation and ensuring complete transparency, from the field to the consumer.

Conclusion

- Our digital approach to rice traceability and authenticity **simplifies** field data recording for farmers and provides a **secure, transparent** system for tracking rice through the entire supply chain;
- By integrating technologies like QR codes, we ensure that consumers and stakeholders can **trust** the **safety, quality, and origin** of the rice they consume.



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thank you!

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