Policy brief

Building a FAIR Future in Agroecology: Data Strategy Recommendations for Living Labs and European Research Infrastructures

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The results of the ALL-Ready project emphasize the importance of rigorous data management guidelines, such as compliance with FAIR principles and ethics.

The All-Ready project provides a detailed framework for agroecology data management, advocating for FAIR principles and ethics.

Setting ethical and replicable data management procedures, having specialized data management teams and developing FAIR- compliant collaborative repositories are essential to maximize the impact of research and advance faster towards sustainable agriculture in Europe.

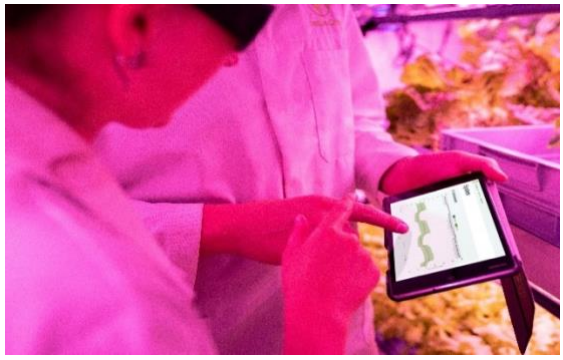

Figure 1. "Scientists Checking Data" by ThisIsEngineering from Pexels. license by BY CC 2.0.

Introduction

The complexity of agroecological system and the amount of data they generate urge for an integrated approach for data management to improve informed decision making. The future Horizon Europe Partnership AGROECOLOGY will support a European Network of Agroecology Living Labs and Research Infrastructures.

This initiative aims, among other objectives, to create a cohesive framework for managing agroecological data across Europe, applying a set of FAIR principles (Findable, Accessible, Interoperable, Reusable), ensuring ethical data collection, and open science practices.

Data management in agroecology extends beyond academic concerns, becoming a matter of societal urgency due to escalating environmental and agricultural challenges. Effective data management is pivotal for guiding sustainable agricultural practices across Europe. Poorly managed data will jeopardize our collective sustainability goals, while a well-executed strategy offers manifold benefits. It can enable farmers to optimize resources, aid policymakers in informed decision-making, and assist researchers in developing effective, sustainable solutions. This makes data management not just an issue of scientific integrity but a cornerstone for societal resilience in an uncertain future. Human expertise is critical, especially in managing large and complex datasets. The ALL-Ready project is an urgent advancement that not only enriches scientific research but also provides tangible societal benefits by leveraging data for more sustainable farming.

Approach and results

Understanding the Landscape

In the evolving world of agriculture, where climate change and environmental protection are growing concerns, data-driven decision-making has become imperative. To navigate these complex issues, we engaged in a comprehensive study to streamline how data can be effectively gathered, managed, and utilized across the agricultural ecosystem. Our mission was clear: to create a robust data strategy that would aid in research, inform policymakers, and empower farmers.

Research Design and Execution

ALL-Ready started with a thorough assessment of the existing data management practices in agriculture, particularly in the areas of agroecology and sustainability. We assembled a dedicated team of experts to dissect the current state of the art and identify gaps and opportunities. Our team assessed all stages of data management cycle, from initial data collection to long-term data preservation.

To that end, various methodologies were utilized. Firstly, informative meetings with all project partners were held to discuss the Data Management Plan (DMP). Secondly, a comprehensive questionnaire was designed aimed at understanding existing data management practices, attitudes towards data sharing, and areas that required improvement in a Pilot Network of Agroecology Living Labs and Research Infrastructures. This questionnaire was distributed across all the partners of the project and members of the Pilot Network.

The combination of these two methods provided us with a holistic view of the current state and helped us identify the necessary steps for an effective data strategy implementation.

Additionally, legal consultations were held to navigate the complicated waters of data governance and ethics.

Discovering the Goldmine: Benefits and Opportunities

The work uncovered enlightening results. We learned that data, when harnessed correctly, could be a powerful tool in promoting sustainable agricultural practices. It'll provide farmers with insights into soil health, crop rotation, and resource allocation, thus leading to better yields with lower environmental impact.

Capacity building on data management is also key in this process. Training sessions have the potential to equip farmers and local communities with the skills to be active participants in data collection and interpretation. This democratization of data could boost community engagement and pave the way for data-driven decision-making at the grassroots level.

ALL Ready

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000349 (ALL-Ready).

Valuable Insights: What We Learned

The most significant result was the understanding that data could serve as a common language, bridging the gap between researchers, policymakers, and farmers. We found that a well-implemented data strategy will:

1. Enhance transparency and reproducibility in research.
2. Provide actionable insights for sustainable farming.
3. Foster a culture of continuous improvement and adaptation.

Additionally, our data-sharing policies and governance frameworks ensure that all data would be handled ethically and securely, respecting legal frameworks and individual privacy.

The Road Ahead

Our study shows that a robust data strategy is not just a bureaucratic necessity but a catalyst for change. Moving forward, we will regularly review and update the strategy based on feedback and emerging needs.

This effort is not just a step but a leap towards creating a more sustainable, equitable, and data-driven agricultural ecosystem. With this data strategy, we are sowing the seeds for a future where agriculture works in harmony with our planet.

"A well-implemented data strategy bridges the gap between researchers, policymakers, and farmers, fostering transparency and sustainable farming"

Conclusions

Robust data management is not merely an administrative requirement but an engine for transformative change in agroecology. This work revealed that a well-crafted data strategy serves as a conduit between researchers, policymakers, farmers, advisors, and participants in living labs, fostering collaboration, transparency, and sustainability. It underscores the need for a standardized, ethical framework for data governance. Data, when utilized judiciously, could significantly advance sustainable farming practices, enhancing crop yields while minimizing environmental impact. The data thus legitimizes the need for a dedicated team of experts and standardized protocols for maintaining data integrity. In essence, strategic data management is not an option but a necessity for advancing sustainable agricultural practices in the era of climate change and ecological vulnerability.

Implications and recommendations

By adopting some targeted actions, policy makers, research infrastructures and living labs and stakeholders in general can significantly advance agroecology data management, creating a more effective, collaborative, and impactful research environment. The following recommendations are provided:

1. Strengthen Internal Data Management Units: Each organization or institution should consider establishing or bolstering an internal team focused solely on implementing and overseeing the data management plan.

2. Create a Shared Data Repository: Stakeholders should collaborate to establish a centralized, secure, and easily accessible data repository. This repository should adhere to FAIR principles and enable efficient data sharing among partners.

3. Collaborate on Standardized Protocols: Given the global nature of agroecological challenges and to ensure data integrity and comparability, stakeholders should work together to develop standardized data collection and analysis protocols.

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4. Support Open-Source Platforms:
Funding agencies should prioritize grants or subsidies for projects that aim to develop open-source data management platforms. This would democratize access to tools and technologies, making it easier for various stakeholders to contribute to agroecology research.

5. Implement Regulatory Guidelines:
Policymakers should establish clear regulatory guidelines for data management in agroecology. These guidelines could set the standard for FAIR compliance, ethical practices, and data sharing, providing a cohesive framework that organizations and living labs can follow.

6. Build capacity in data management:
Regular workshops and training sessions should be conducted among stakeholders to disseminate the best data collection, storage, and analysis practices and raise awareness of its importance.

7. Provide clear guidance on ethical practices:
Foster leadership of organisations and members participating in research and innovation activities to act as a leader in ethical data management practices and emphasising the importance of data in agroecology research and application.

Additional reading

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About ALL-Ready: ALL-Ready is a Coordination and Support Action (CSA) funded by the European Commission (EC) with the aim of preparing a framework for a future European network of Living Labs (LL) and Research Infrastructures (IR) that will enable the transition towards agroecology throughout Europe. Based on the premise that agroecology can strengthen the sustainability and resilience of farming systems, the project will contribute to addressing the multiple challenges that they are facing today including climate change, loss of biodiversity, dwindling resources, degradation of soil and water quality.

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