TRIBIOME

PRACTICE ABSTRACT

Cultivating Resilience and Protecting the Soil: Empowering Farmers through Data-Driven Decision Support

SUMMARY

This abstract explores the potential of a robust decision support platform to empower farmers in adopting sustainable agricultural practices and preserving soil health. The platform integrates real-time data from various soil sensors, including humidity, temperature, weather conditions, and more, to aid farmers in making informed decisions *(Gómez et al., 2019; Vallad et al., 2021)*. By addressing the challenges of modern agriculture through data-driven insights, the platform envisages improved crop resilience, resource efficiency, and environmental conservation. This innovation holds the promise of benefiting farmers, ecosystems, and the broader agricultural community (*Demeter Project, 2020).*

EXPECTED RESULTS

Informed decision-making: the decision support platform is expected to provide farmers with real-time data and actionable insights, enabling them to make well-informed decisions on planting, irrigation, and resource management.

Enhanced crop resilience: access to data-driven recommendations will help farmers optimize planting schedules, irrigation levels, and pest management ultimately leading to increased crop resilience in the face of changing environmental conditions.

Resource efficiency: farmers using the platform are likely to reduce resource wastage, such as water and fertilizers, by tailoring their practices to the specific needs of their crops, thus contributing to resource efficiency.

Soil health preservation: through data-driven soil management, farmers can implement practices that safeguard soil health, prevent erosion, and promote microbiome diversity.

PROBLEM

Contemporary agriculture faces multifaceted challenges, including climate variability, resource scarcity, and soil degradation. Farmers often lack access to real-time data and decision support systems *(Demeter Project, 2020),* hindering their ability to adapt to changing conditions and make informed choices. This knowledge gap can result in decreased productivity, resource inefficiency, and soil health deterioration.

SOLUTION

The proposed decision support platform offers a comprehensive solution by leveraging real-time data from soil sensors and meteorological sources *(Demeter Project, 2020; Vallad et al., 2021)*. It empowers farmers to make data-driven decisions related to planting, irrigation, and resource management, fostering resilience and soil protection. By integrating tools and methodologies for sustainable agriculture and microbiome preservation, the platform aims to address the challenges posed by modern farming.

APPLICABILITY BOX

Theme:, sustainable agriculture practices
Keywords : Decision support platform, soil health, resilience, sustainable farming
Geographical coverage: EU
Application time: year-round
Period of impact: on-going
Equipment: soil sensors, meteorological stations, internet communication tools

BENEFITS

Data-driven resilience: the platform enables farmers to respond promptly to environmental changes, enhancing the resilience of their farming systems. *(Demeter Project, 2020)*

Resource conservation: by optimizing resource use, farmers can reduce costs and minimize environmental impacts *(Demeter Project, 2020; Vallad et al., 2021),* contributing to sustainable agriculture.

Soil health: data-driven soil management promotes microbiome diversity, soil structure preservation, and erosion prevention, ensuring the long-term health of agricultural soils *(Demeter Project, 2020; Gómez et al., 2019).*

Environmental stewardship: the platform aligns with environmental goals by reducing overuse of resources and minimizing soil and water contamination *(Demeter Project, 2020).*

TARGETS

Farmers and agricultural communities: The primary target audience is farmers seeking to enhance their farming practices and resilience through data-driven decision support.

Agricultural extension services: Extension services can use the platform to educate and support farmers in implementing sustainable agricultural practices.

Research institutions: Researchers can benefit from the platform's data for studies related to climate adaptation, soil health, and sustainable agriculture.

Government agencies: Agriculture departments and environmental agencies can promote the platform to incentivize sustainable farming practices and soil protection.
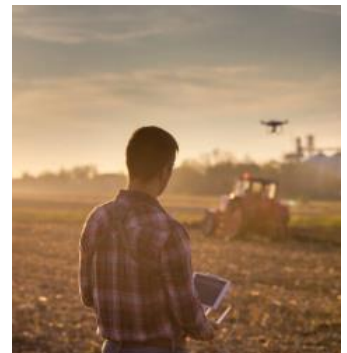
CONCLUSION

The decision support platform represents a transformative tool in the pursuit of sustainable agriculture and soil protection, as highlighted by various sources including the *Demeter Project, Gómez et al. (2019),* and *Vallad et al. (2021).* By providing real-time data and insights to farmers, it equips them to make informed decisions that enhance resilience, conserve resources, and safeguard soil health. This innovation has the potential to benefit not only farmers but also the environment and society at large by promoting responsible and data-driven farming practices.

FURTHER INFORMATION/ BIBLIOGRAPHY

Demeter Project. (2020). Demeter D6.3 – Decision Support System for Farmers. Retrieved from [https://h2020-demeter.eu/].

Gómez, E., Ferraz, A. I., & Ferreira, P. J. S. (2019). IoT-Based Decision Support Systems for Agriculture: A Review. Computers and Electronics in Agriculture, 157, 436–457. doi:10.1016/j.compag.2019.01.022

Vallad, G. E., Goodman, R. M., Kakar, K., & Rodrigues, F. A. (2021). Data-Driven Decision Support Systems for Sustainable Agriculture. In Smart Farming Technologies for Sustainable Agricultural Development (pp. 123–150). Springer. doi:10.1007/978-3-030-68241-3_5

ABOUT THIS PRACTICE ABSTRACT

Funded by the European Union