

# Assessing farmers' adoption process on the transition to agroecology by using social ecological system framework and bioeconomic modelling in Algeria

Seyhan Sevde CAGIRAN<sup>1</sup>, Amelie BOURCERET<sup>1</sup>, Sophie DROGUE<sup>1</sup>



## 1. Preface

- Current conventional agricultural systems do not seem to be able to sustainably respond to growing needs under the climate change and challenging conditions (Malik et al., 2023).
- Agroecology is a sustainable agricultural system based on and respects the ecosystem in which agriculture is practiced and the ecosystem elements within it (Wezel et al. 2009).
- Agroecology promises resilience and sustainability not only to the ecosystem, but also to farmers, consumers and managers, both socially and economically (Perfecto et al. 2010).



## 2. Study area



- The study takes place in the Living Lab of the NATAE project in Laghouat, with a high diversified cropping pattern in a peri-oasis system with the majority of the small-scale farms.
- The climate in the region is arid and traditionally and historically characterized by date palms and livestock, the wilaya has a growing trend towards mixed farming in order to meet the increasing demand on the local market with a variety of products.
- The local market is characterized by a high demand for a range of products, including fruits, vegetables, meat and poultry.



## 3. Methods

**Literature Review**  
About the study area, Social-ecological systems, and Bioeconomic modeling

**Data Collection**  
For bioeconomic model and SESF, through participatory methods and interviews with farmers and experts

**SESF**  
Ostrom's social ecological framework in order to analyze the production system in the region and the role of farmers and ecology in it

**Bioeconomic model**  
DAHBSIM, dynamic, bio-economic model of agricultural households, to investigate various economic, ecological and social indicators and different scenarios

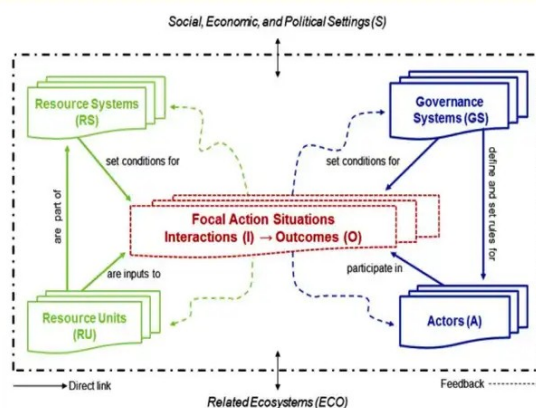


Figure 1: Revised social-ecological system (SES) framework from McGinnis and Ostrom (2014)



## 4. Expected outcomes

The results of the SESF, may allow us to identify the variables in the adoption of a new and more sustainable agronomic system by farmers in the region

The bioeconomic model make it possible to see how various indicators, not only farmer adoption, but also economic and ecological, change under different scenarios

Another expected result is to propose policies that are not only environmentally sustainable, but also socially equitable and economically viable

### Acknowledgments

This research has been carried out under the NATAE project (Horizon Europe: ID 101084647) funded by the European Union.

10<sup>th</sup> International Degrowth Conference and 15<sup>th</sup> Conference of the European Society for Ecological Economics

1 UMR MoISA, MoISA, University of Montpellier, CIHEAM-IAMM, CIRAD, INRAE, Institut Agro, IRD, Montpellier, France



### References

- Malik, S., Kishore, S., Dutta, A. K., & Chavanna, A. (2023). Sustainable agriculture approach through endophytes in Endophytic Association: What, Why and How (pp. 303-318). Academic Press.
- Ostrom, E. (2009). A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science*, 325(5928), 419-422.
- Perfecto, I. & Vandermeer, J. (2010). The agroecological matrix as an alternative to the semi-spraying/agriculture intensification model. *Proceedings of the National Academy of Sciences*, 107(11), 5786-5791.
- Wezel, A., Bellon, S., Doré, T., et al. (2009). Agroecology as a science, a movement and a practice: A review. *Agron. Sustain. Dev.*, 29, 303-313 (2009). <https://doi.org/10.1007/s10265-009-0004-4>

