

# PhD School on Agriculture, Environment and Bioenergy

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(XXXVII cycle, 2021-24)

## Project draft

### 1. Field of interest

*Indicare il/i settore/i scientifico disciplinari: AGR/02*

### 2. Project title

Practices and Innovative Agroecological techniques for the Modern Farm (AgroecolFARM)

### 3. Tutor: Prof. Stefano Bocchi

- **Eventually: co-tutor/s**

### 4. Relevance of the topic and state of the art:

Agroecology is considered as a new paradigm for the future agriculture, that is looking for a real sustainable development, as design by Agenda 2030. In the future-post-2023 UE Agricultural Policy, Agroecology is indicated among the agroschemes and this will imply the possibility to obtain funds for innovation, but the farm will have to show the ability to plan agro-ecological interventions and to implement them in a coherent efficient way. Agronomical research is urgently required at farming level, by including the participation of the farmers, in order to analyse and evaluate new rotations, new agroecological practices, new products for a real sustainable cropping systems management.

### 5. Layout of the project (draft)

#### 5.1. Materials & Methods:

The first step will be a complete and updated meta-analysis of the papers related to agroecological studies at farming system level in order to have a general picture of the state of art and the trends.

Two or three farms will be individuated for organizing the analysis of different farming systems producing cereals (i.e. rice) and other crops together with other ecosystem services. The field research will be carried out in order to evaluate and assess some products available for the crop stress management (weed competition, fungi attacks etc).

#### 5.2. Schedule and major steps (3 years):

The analysis of the scientific literature will be the first step followed by the organization and implementation of the field research dedicated to the comparison of different strategies of crop management (second and third year). The field (farming system scale) research carried out in two-three farms located in the Po Valley is considered crucial in order to obtain those data for the evaluation of the agroecological strategies carried out with different evaluation tools.

### 6. Available funds (source and amount)

The Ph.D. research will be completely supported by Terre Padane in terms of the so called Dottorato Industriale or Executive Ph.D program, so the collaboration form between Unimi and Terre Padane should be signed.

### 6. Literature:

Altieri M. 1989. "Agroecology: A new research and development paradigm for world agriculture", Agriculture, Ecosystems and Environment, n. 27, pp. 37-46.

- Bocchi S. (2017) The Yield in the Context of Industrial Versus Sustainable Agriculture. Chapter 1 in *More Food: Road to Survival*, 2017, 3-21 edited by Piloni and Gavazzi (Eds.) 2017 Bentham Science Publishers.
- Bocchi S. 2019. Is there any Italian specific model for Agroecology? In *Rules of Utopia, Policies to drive us out of the crisis*. Fondazione Feltrinelli. ISBN 978-88-6835-373-5
- Bocchi S. (2020). Agroecology: relocalizing agriculture accordingly to places. In *Bioregional Planning and design: vol.II*. Fanfani D. and Ruiz Mataran A. Springer Nature, 2020: 81 – 103.
- Bocchi S. Orlando F. 2020. Impact of agricultural practices on biodiversity of soil invertebrates. Editors: Bocchi S., Orlando F. MDPI
- Gliessman S. **2018**. *Agroecology: The Ecology of Sustainable Food Systems*, Third Edition. CRC Press, 405 pp
- Orlando F., Alali S. , Vaglia V., Pagliarino E., Bacenetti J., Bocchi S., organic rice network 2020. Participatory approach for developing knowledge on organic rice farming: Management strategies and productive performance. *Agricultural Systems* 178 (2020) 102739
- Wezel et al. 2015 Ecological territories: places for sustainable agricultural and food systems and biodiversity conservation, *Agroecology and sust. Food systems*, 40, 132- 144