

PhD Thesis Defense

On **Wednesday February 26th 2025 at 3.00 pm**, in the classroom **G**, Via Santa Sofia 100

Mariarita Cammarata (XXXVII cycle)

Will discuss her PhD theses titled

International
Doctor
Candidate

THE DYNAMICS OF VOLUNTARY CARBON MARKET IN AGRICULTURE: A COMPREHENSIVE ANALYSIS OF ENVIRONMENTAL, SOCIAL, AND ECONOMIC PERSPECTIVES

Thesis Abstract

The urgent need to achieve climate neutrality and counteract the effects of climate change requires the agricultural sector to reduce greenhouse gas emissions and capture carbon through natural sinks. Carbon farming has emerged as a key model for achieving these goals, contributing to the development of Carbon Markets in which carbon credit trading aims to offset emissions from different economic sectors. This thesis adopts a multidisciplinary approach to analyze the environmental, social and economic implications of carbon sequestration in agricultural soils and participation in the Carbon Market. The study involves two citrus farms in Sicily, managed under conventional and regenerative methods, respectively, along with a sample of farmers from the region. After a thorough *review of the available literature* on the subject, the environmental assessment was conducted by quantifying the Carbon Balance using the *Carbon Footprint* methodology and the SALUS crop model. The results paved the way for analyzing Sicilian farmers' intentions to participate in the Voluntary Carbon Market through the application of the *Extended Theory of Planned Behavior*, highlighting the influencing factors. Finally, the economic evaluation was carried out by compiling *farm balance sheets* for both types of citrus management and assessing three scenarios: “business as usual”, in which farmers receive Common Agricultural Policy aid; “participation in the Voluntary Carbon Market”, through the generation of offset credits; and the hypothetical “inclusion of the agricultural sector in the Compliance Carbon Market”, from which it is currently excluded in Europe. The results of the study highlight that, unlike a well-established Compliance Carbon Market, the European Union is still in the early stages of establishing a Voluntary Carbon Market. The agricultural sector, particularly the citrus sector, has significant potential for carbon sequestration in soils. However, the high costs associated with implementing sustainable agricultural practices and developing sequestration projects pose a significant barrier to farmers' participation. This work offers substantial insights for policymakers, farmers, and researchers in the field, and serves as a foundational reference that calls for further investigation to fully explore the opportunities offered to the agricultural sector by Carbon Markets.

Advisors:
Prof. Alessandro Scuderi

Co-advisor:
Prof. Giuseppe Timpanaro