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crea  
Consiglio per la ricerca in agricoltura  
e l'analisi dell'economia agraria

# Missione 4 Istruzione e Ricerca

# ECOWHEATALY

## Evaluation of policies for enhancing sustainable wheat production in Italy

### PRIN MUR 2022

Edmondo Di Giuseppe

Sara Quaresima



# ECOWHEATALY

## Programma dell'incontro del 30 Gennaio 2025

### Agenda

- 10.00 - 10.15 Scadenze amministrative e rendicontazione (Sara Quaresima - CNR)
- 10.15 - 10.30 Descrizione degli obiettivi raggiunti e prossime scadenze. Aggiornamento su comunicazione e disseminazione (Edmondo Di Giuseppe - CNR )
- 10.30 - 10.50 Politiche agricole per il grano ed Ecoschemi (Ilaria Zappitelli - CNR)
- 10.50 - 11.10 Risultati della Cluster Analysis (Alessandro Ceccarelli - UNICH; Arianna Di Paola - CNR)
- 11.10 - 11.30 Comfort break
- 11.30 - 11.50 Implementazione ABM (Gianfranco Giulioni - UNICH)
- 11.50 - 12.10 Progettazione della GUI ed aggiornamenti sul sito web (Marco Simonetti, Alessandro Manna - CNR)
- 12.10 - 12.50 Discussione (Massimiliano Pasqui, Piero Toscano, Simona Tarra, Leandro Rocchi - CNR; Antonella Del Signore, Antonio Gattone - UNICH; Stanislao Esposito - CREA)
- 12.50 - 13.00 Programmazione attività successive (Gianfranco Giulioni - UNICH; Edmondo Di Giuseppe - CNR)

[link to the meeting](#)

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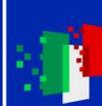
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# Financial aspects





# Financial aspects: costs and funding

Starting from  
28/09/2023

Duration: 24 months

it can be extended  
to 3 months ahead

27/12/2025

Project number:  
202288L9YN

CUP master:  
D53D23006260006

MUR Funding:  
193 602,00 €

Co-funding :  
90 200,00 €

Total grant:  
283 802,00 €

University  
"G. d'Annunzio" CHIETI-PESCARA

Principal Investigator : Gianfranco Giulioni

CUP D53D23006260006

The National Research Council of Italy

Associated Investigator : Edmondo Di Giuseppe

CUP B53D23009770006

113 160,00 €

49 200,00 €

162 360,00 €

MUR Funding

Co-funding

Total Grant

80 442000 €

41 000,00 €

121 442,00 €



# Financial aspects: Research grants

		2023				2024												2025											
		S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
U D A	<b>A.Ceccarelli</b> 01/05/24 12 months																												
C N R	<b>I.Zappitelli</b> 03/06/24 12 months																												



Project duration in months



Project extension



Fellowship term in months



# Financial aspects: Research grants

		2023				2024												2025											
		S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
U D A	<b>A.Ceccarelli</b> 01/05/24 12 months																												
C N R	<b>I.Zappitelli</b> 03/06/24 12 months																												
U D A	<b>01/03/25</b> 12 months																												



Project duration in months



Project extension



Fellowship term in months



New Fellowship term in months

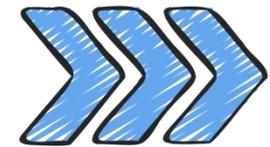


# Financial aspects: Research grants

Prior to the completion of the  
12-month period, every research fellow is  
required to submit a  
**final report**  
detailing their  
**research activities**



**extension  
of the  
research grant  
contract**





# Financial aspects: a final report

Starting from  
28/09/2023

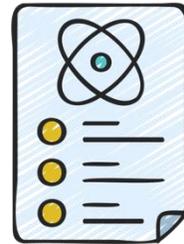
Duration: 24 months

it can be extended  
to 3 months ahead

27/12/2025

## Reporting documentation:

- ✓ Final technical and scientific report outlining the work carried out and outcomes obtained
- ✓ Financial statement



No interim financial reports  
or scientific progress reports  
are required

A final expenditure  
report must be  
submitted  
within 60 days

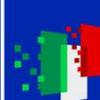




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# Financial aspects: a final report

Starting from  
28/09/2023

Duration: 24 months

it can be extended  
to 3 months ahead

27/12/2025



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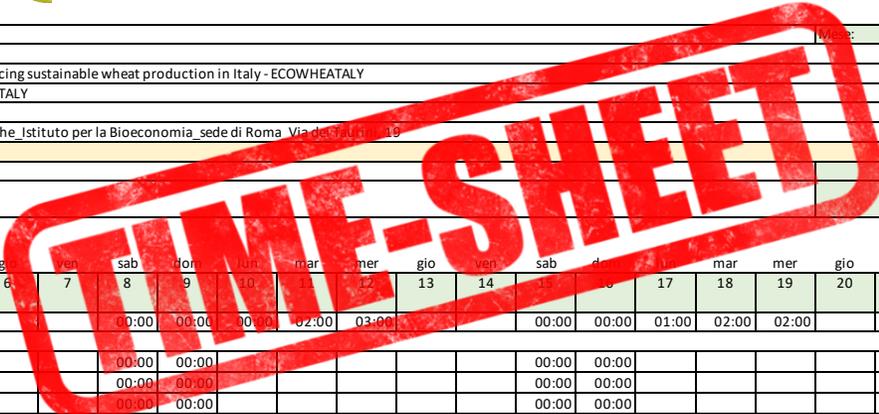
Consiglio Nazionale delle Ricerche

TIMESHEET PER RENDICONTAZIONE PERSONALE

Giugno Anno: 2024

Titolo del progetto:		Evaluation of policies for enhancing sustainable wheat production in Italy - ECOWHEATALY																													
CUP progetto:		B53D23009770006 ECOWHEATALY																													
Codice del progetto:		202288L9YN																													
Denominazione soggetto:		Consiglio Nazionale delle Ricerche_Istituto per la Bioeconomia_sede di Roma_Via del Quadraro 19																													
Nome:		Edmondo																										Cognome:		Di Giuseppe	
Codice Fiscale:		DGSND71L09H501K																										Ore totali rendicontate sul progetto per il mese in oggetto:		10:00:00	

DAY	sab	dom	lun	mar	mer	gio	ven	sab	dom	lun	mar	mer	gio	ven	sab	dom	lun	mar	mer	gio	ven	sab	dom	Totale	
Riferimento																									
Attività svolta sul progetto	00:00	00:00						00:00	00:00	00:00	02:00	03:00			00:00	00:00	01:00	02:00	02:00			00:00	00:00	00:00	
Attività svolte su altri progetti MUR																									
CUP 1: B53D23026590001 NEUTRALISE	00:00	00:00	03:00	03:00	04:00			00:00	00:00						00:00	00:00						00:00	00:00	20:00:00	
(Cup e acronimo progetto 2)	00:00	00:00													00:00	00:00								0:00:00	
(Cup e acronimo progetto 3)	00:00	00:00						00:00	00:00						00:00	00:00								0:00:00	
Attività svolte su altri progetti:	00:00	00:00						00:00	00:00						00:00	00:00								0:00:00	
Attività ordinaria	00:00	00:00	04:12	04:12	03:12	07:12	07:12	00:00	00:00	07:12	05:12	04:12		07:12	00:00	00:00	06:12	05:12	05:12		07:12	00:00	00:00	99:36:00	
Altro (Malattia, Ferie, Permessi)	00:00	00:00						00:00	00:00				07:12		00:00	00:00				07:12				14:24:00	
Totale ore	0:00:00	0:00:00	7:12:00	7:12:00	7:12:00	7:12:00	7:12:00	0:00:00	0:00:00	7:12:00	7:12:00	7:12:00	7:12:00	7:12:00	0:00:00	0:00:00	7:12:00	7:12:00	7:12:00	7:12:00	7:12:00	7:12:00	0:00:00	0:00:00	144:00:00





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# ICT Facilities

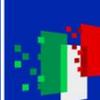




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# CNR Centro Servizi

Owing to the resources offered by the **CNR URS office**, we are presently utilizing a **virtual machine** to execute computational model for data processing, and the **project's website** is also hosted on the same machine



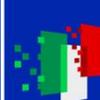
pm-01 (Uptime: 76 days 00:09:36)

CPU usage	2.48% of 128 CPU(s)	IO delay	0.01%
Load average	2.41, 2.43, 2.61	KSM sharing	0 B
RAM usage	19.63% (296.54 GiB of 1.48 TiB)	SWAP usage	0.03% (2.52 MiB of 8.00 GiB)
/ HD space	18.34% (17.22 GiB of 93.93 GiB)		

CPU(s) 128 x Intel(R) Xeon(R) Gold 5218 CPU @ 2.30GHz (4 Sockets)  
Kernel Version Linux 6.5.11-8-pve (2024-01-30T12:27Z)  
Boot Mode EFI  
Manager Version pve-manager/8.1.4/ec5affc9e41f1d79  
Repository Status Proxmox VE updates Production-ready Enterprise repository enabled

## Wheat production process coding

```
import bw2data as bd
#create a new dataset
ecowheatalydb = bd.Database("ecowheataly")
ecowheatalydb.register()
#create a new process called wheat_prod
wheat_prod=ecowheatalydb.new_activity(code='EcoWheataly production',
name="EcoWheataly production",unit = "ha")
#tell that 900 units of work of ag. tractor is used
wheat_prod.new_exchange(input=('usda_item','tractor_use'),amount=900,
unit="megajoule",type='technosphere').save()
#tell that 50 kg Nitrogen is used
wheat_prod.new_exchange(input=('bentrup_item','application of N fertilizer'),
amount=50,unit="kilogram",type='technosphere').save()
wheat_prod.save()
```



# Consortium HPC4DR (High Performance Computing for Disaster Resilience)

The consortium will have access to a high-performance computing infrastructure made available by the INFN Gran Sasso National Laboratories. This infrastructure includes 400 computers donated by CINECA, a leading Italian computing center, along with additional storage and network equipment funded by the Gran Sasso Labs



## 12 consortium partners:

- CNR, GSSI, INAF, INFN, INGV, University of L'Aquila
- University D'Annunzio - Chieti Pescara**
- University of Molise
- University of Camerino
- University of Macerata
- University Politecnica delle Marche
- University of Urbino

The PI Gianfranco Giulioni has asked to use this computer resource for about a year

DURATA DEL PROGETTO	Termine del progetto : 28/09/2025 possibile proroga di 3 mesi.
DATABASE DISPONIBILI PER IL PROGETTO	Banca dati RICA italia <a href="https://bancadatarica.crea.gov.it/default.aspx">https://bancadatarica.crea.gov.it/default.aspx</a>
RISORSE DI CALCOLO NECESSARIE E DURATA DI UTILIZZO DELL'INFRASTRUTTURA	3-5 nodi Durata: circa 1 anno (alcune ore a settimana)
SOFTWARE/HARDWARE NECESSARIO	Mpi4py Repast for python ( <a href="https://repast.github.io/repast4py.site">https://repast.github.io/repast4py.site</a> )



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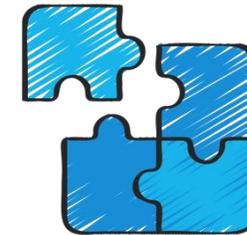


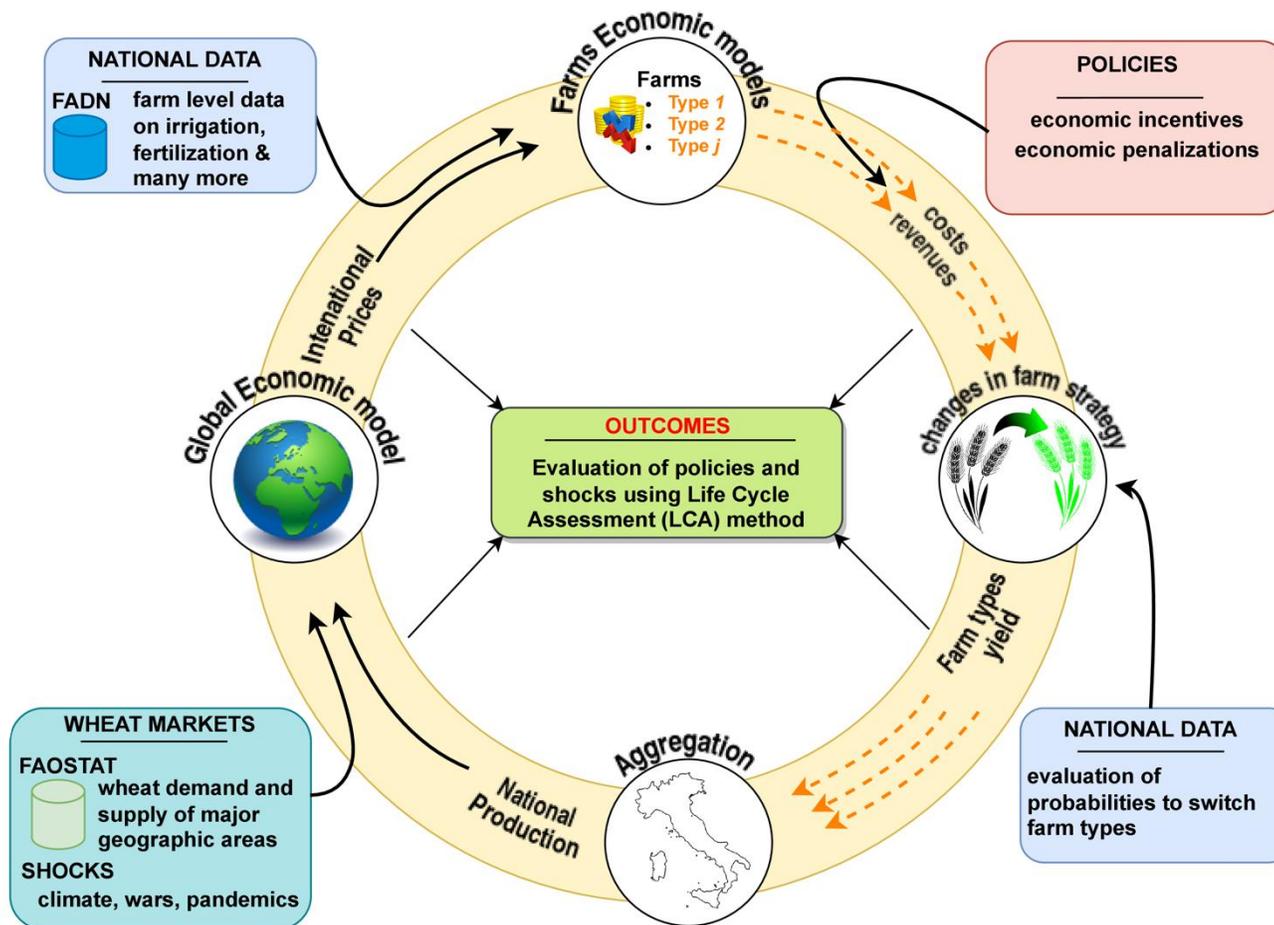
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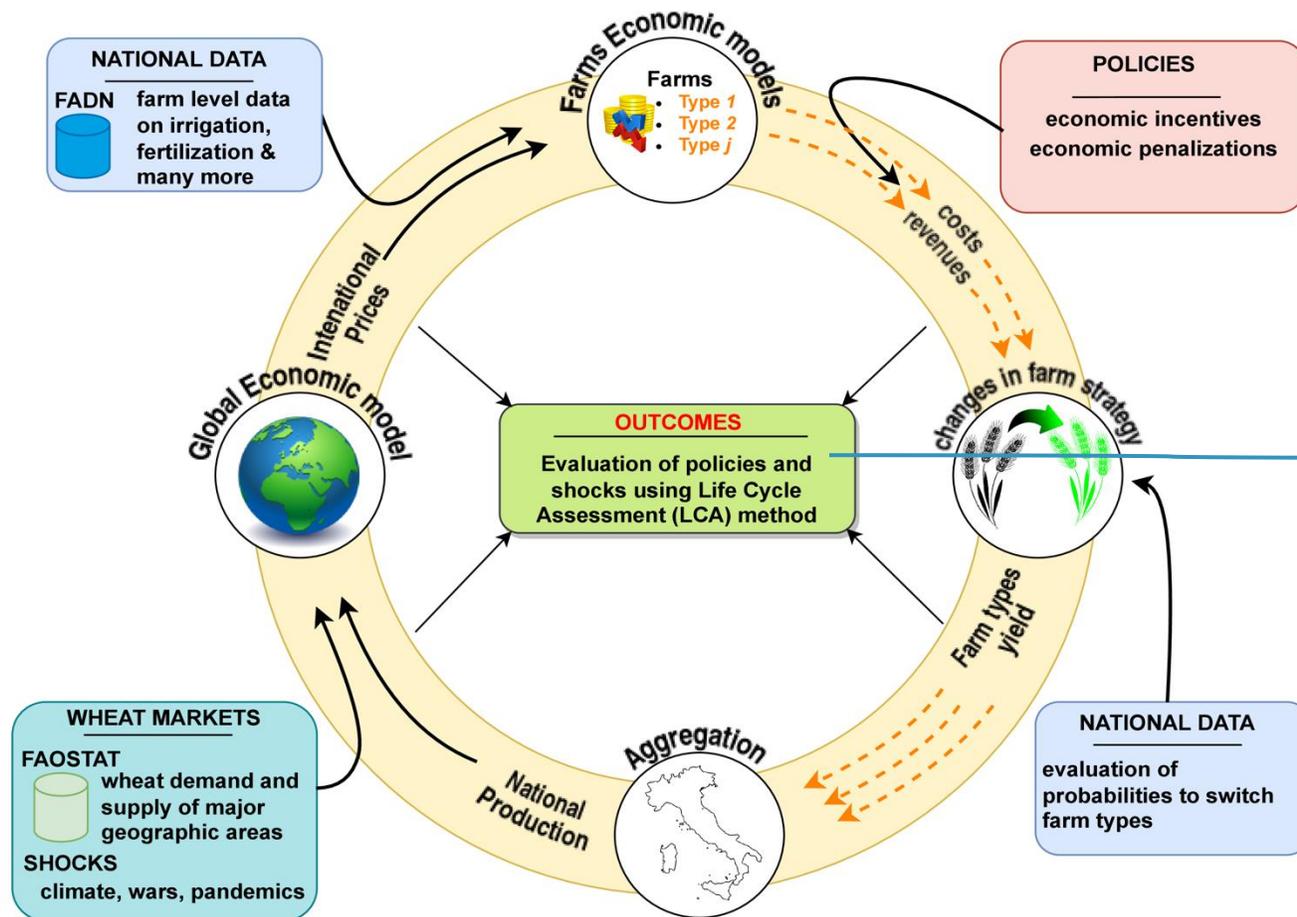
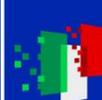
  
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# Tasks - State of the work

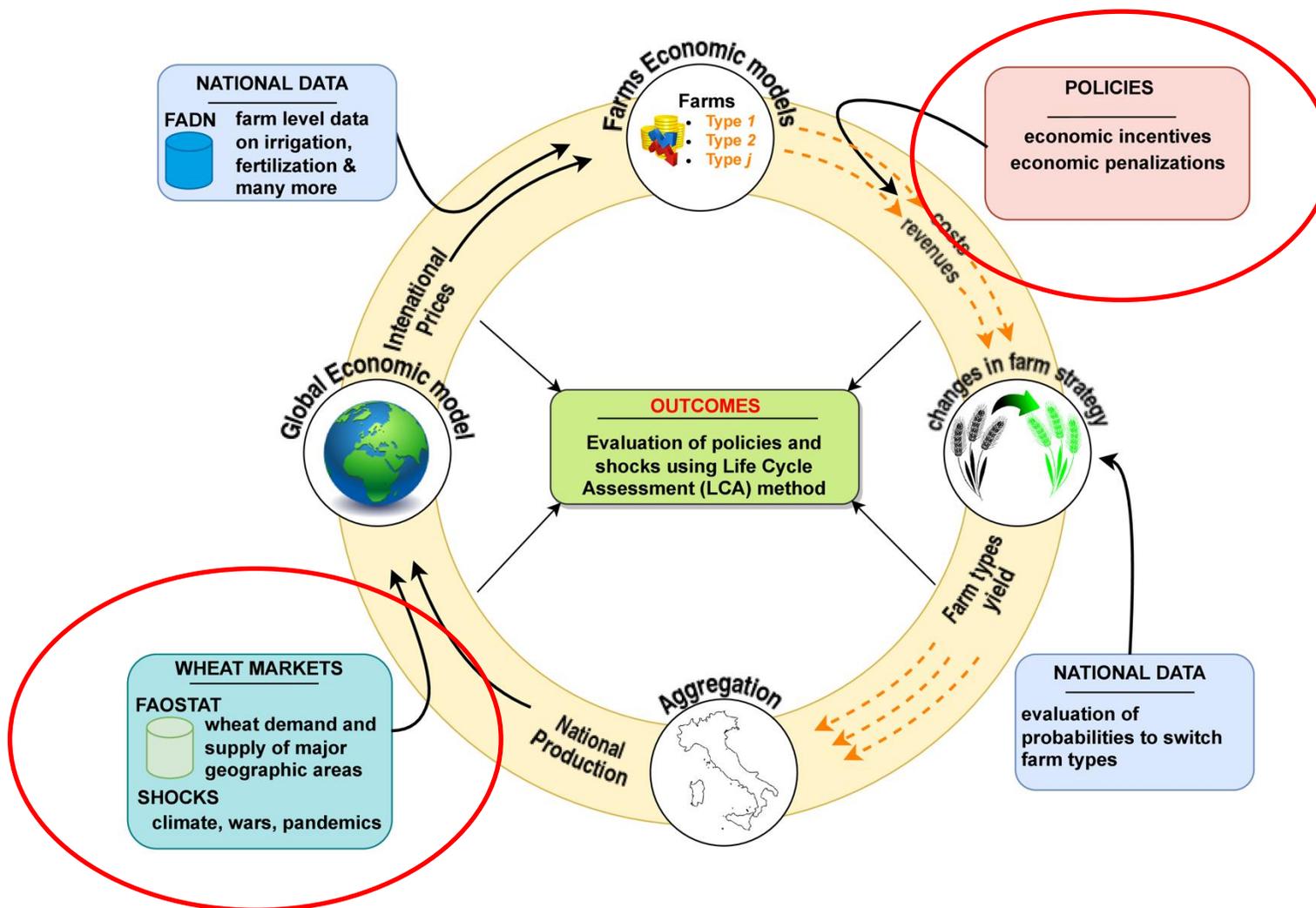
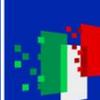






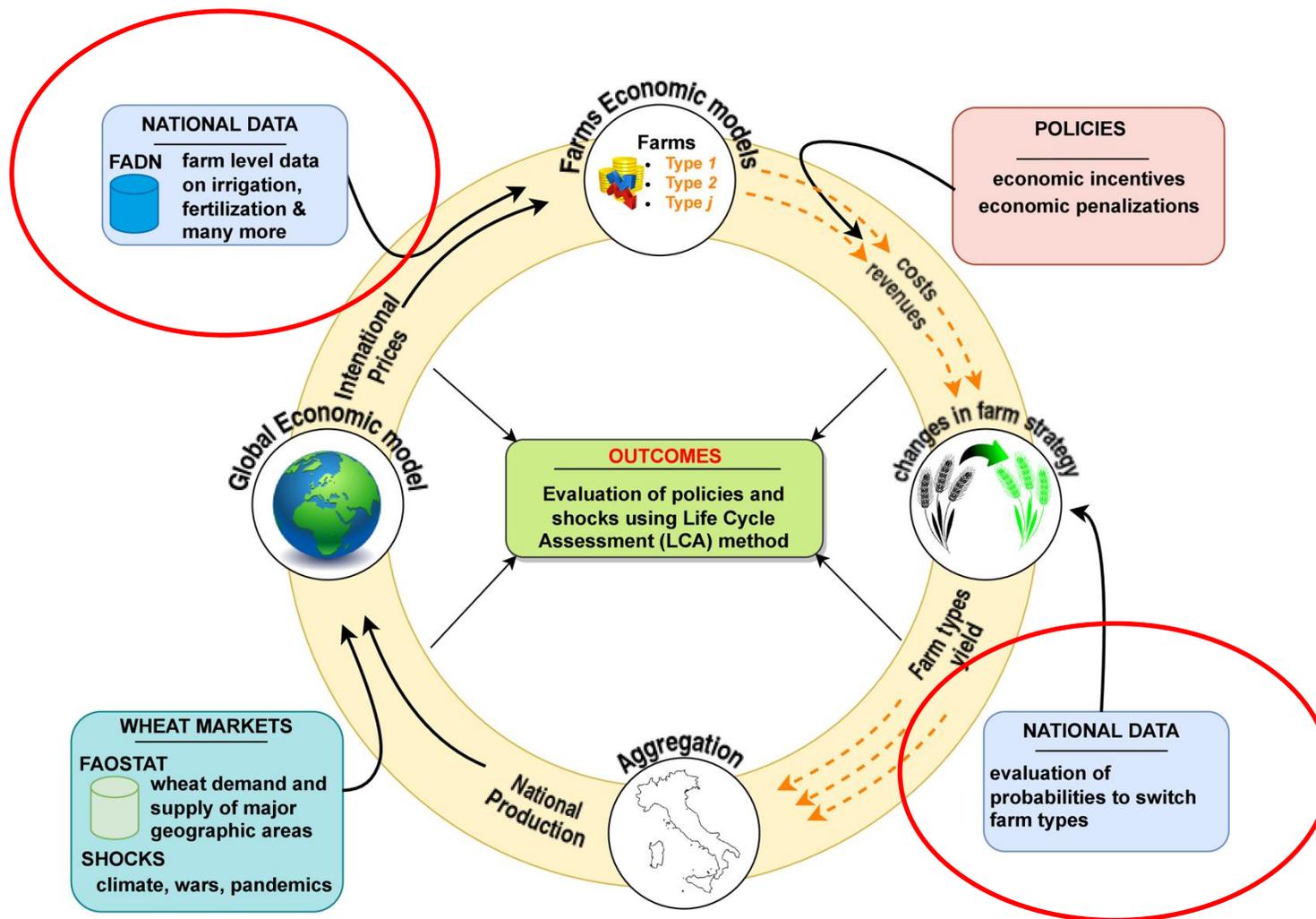
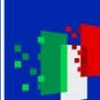
➤ **Task 1.2** Life Cycle Assessment (LCA)

- set up of the methodology for the wheat production system
- set up **Brightway** software



Ilaria's presentation

- **Task 1.1**
- Gathering information and data about the **Italian wheat production system** (IWS)
  - the list of national and EU regulations in terms of external inputs usually used



Alessandro's presentation

- **Task 1.1**
- Classification of farms according to the **care they take for the environmental and natural resources**



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10.30 - 10.50 Politiche agricole per il grano ed Ecoschemi (Ilaria Zappitelli - CNR)

10.50 - 11.10 Risultati della Cluster Analysis (Alessandro Ceccarelli - UNICH; Arianna Di Paola - CNR)



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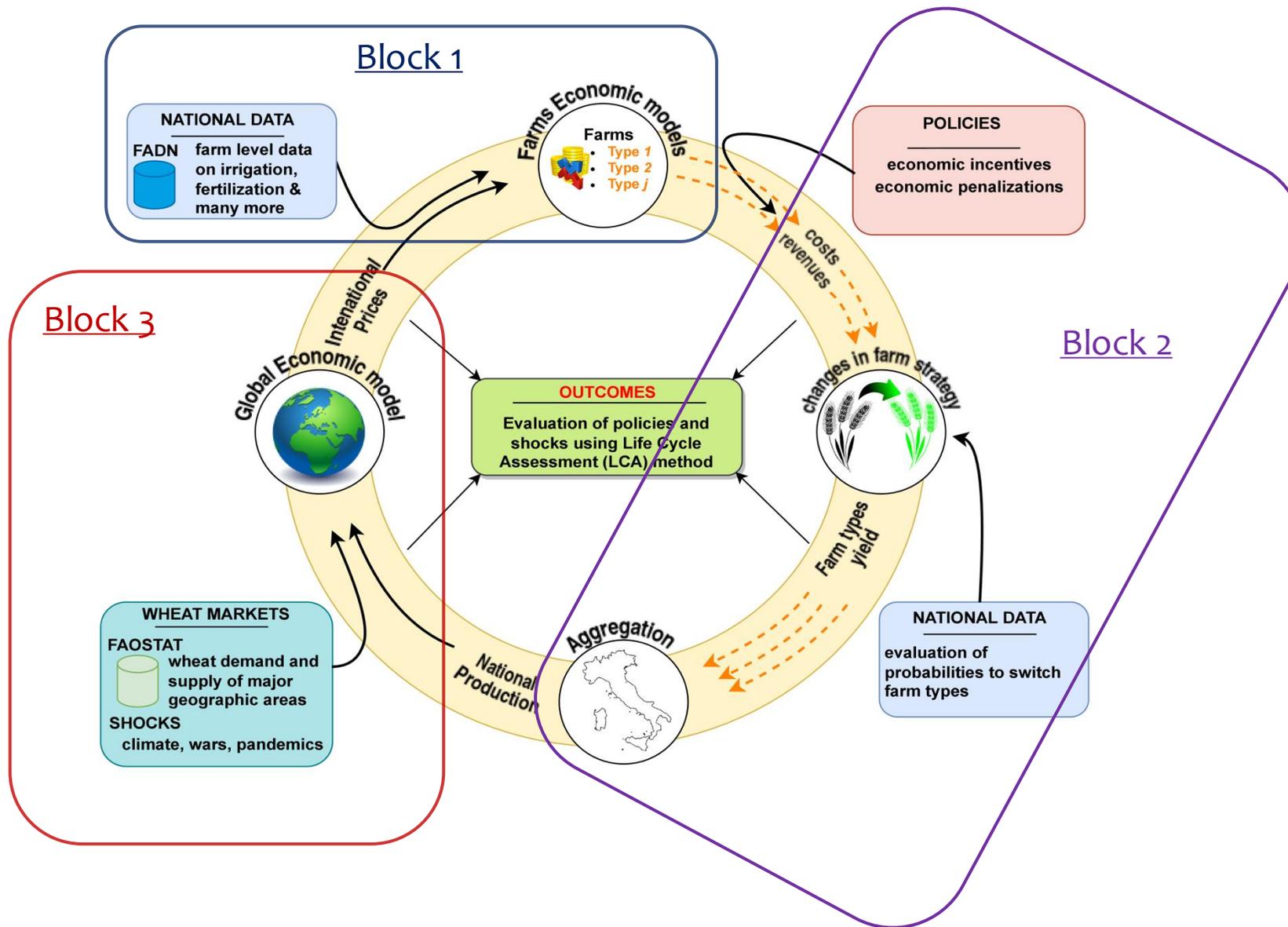
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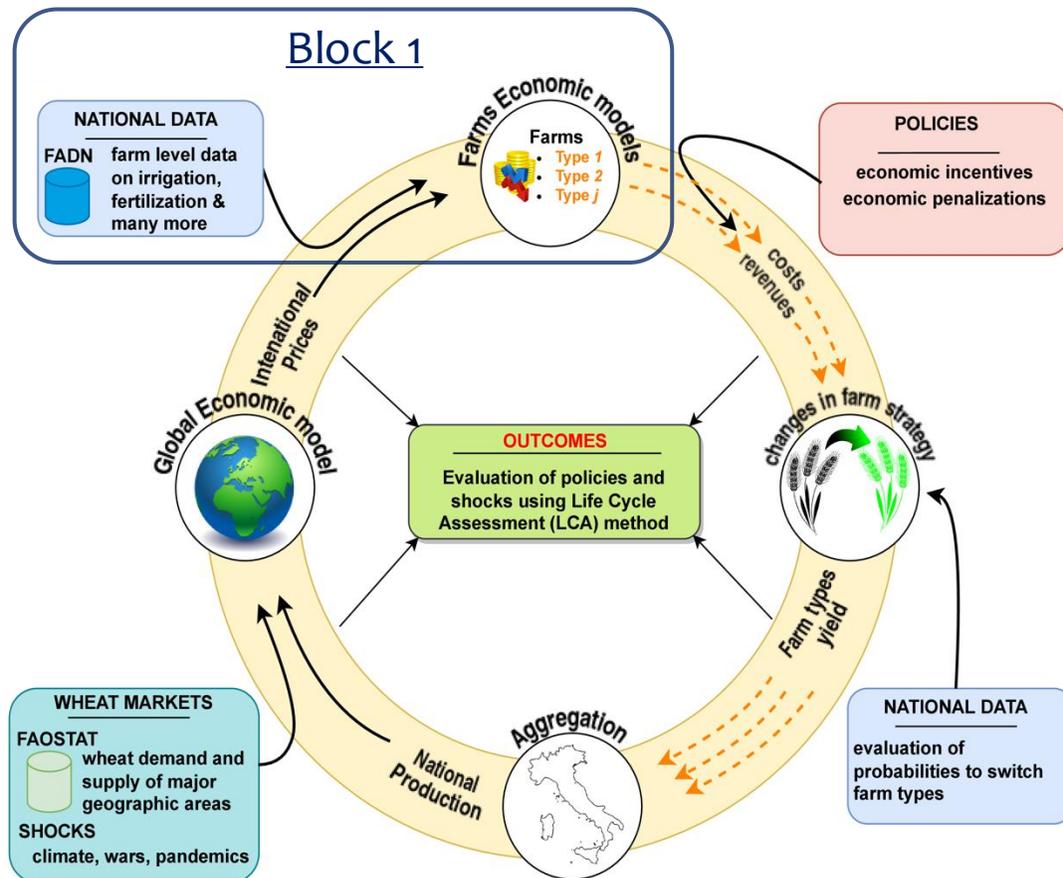
  
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# Comfort break





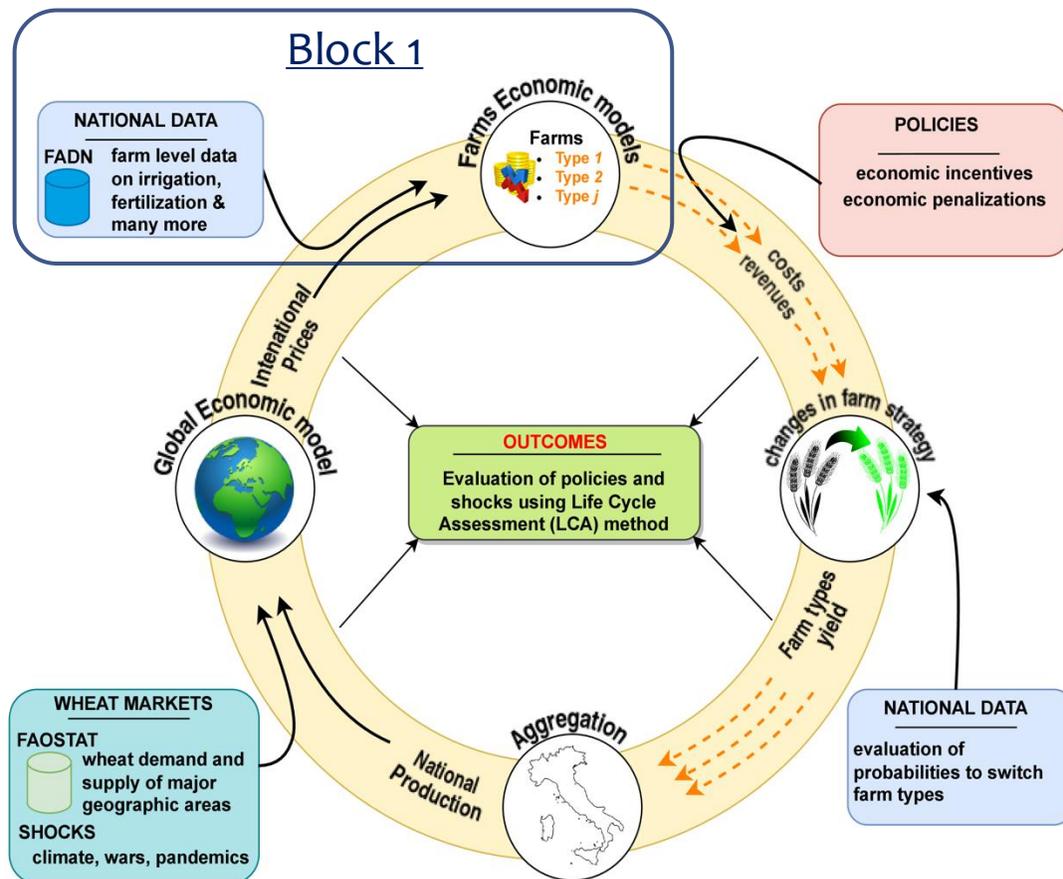


➤ **Task 2.2**

- design and implementation of an **agent-based model** for the IWS

Deliverable (D1)

January 2025

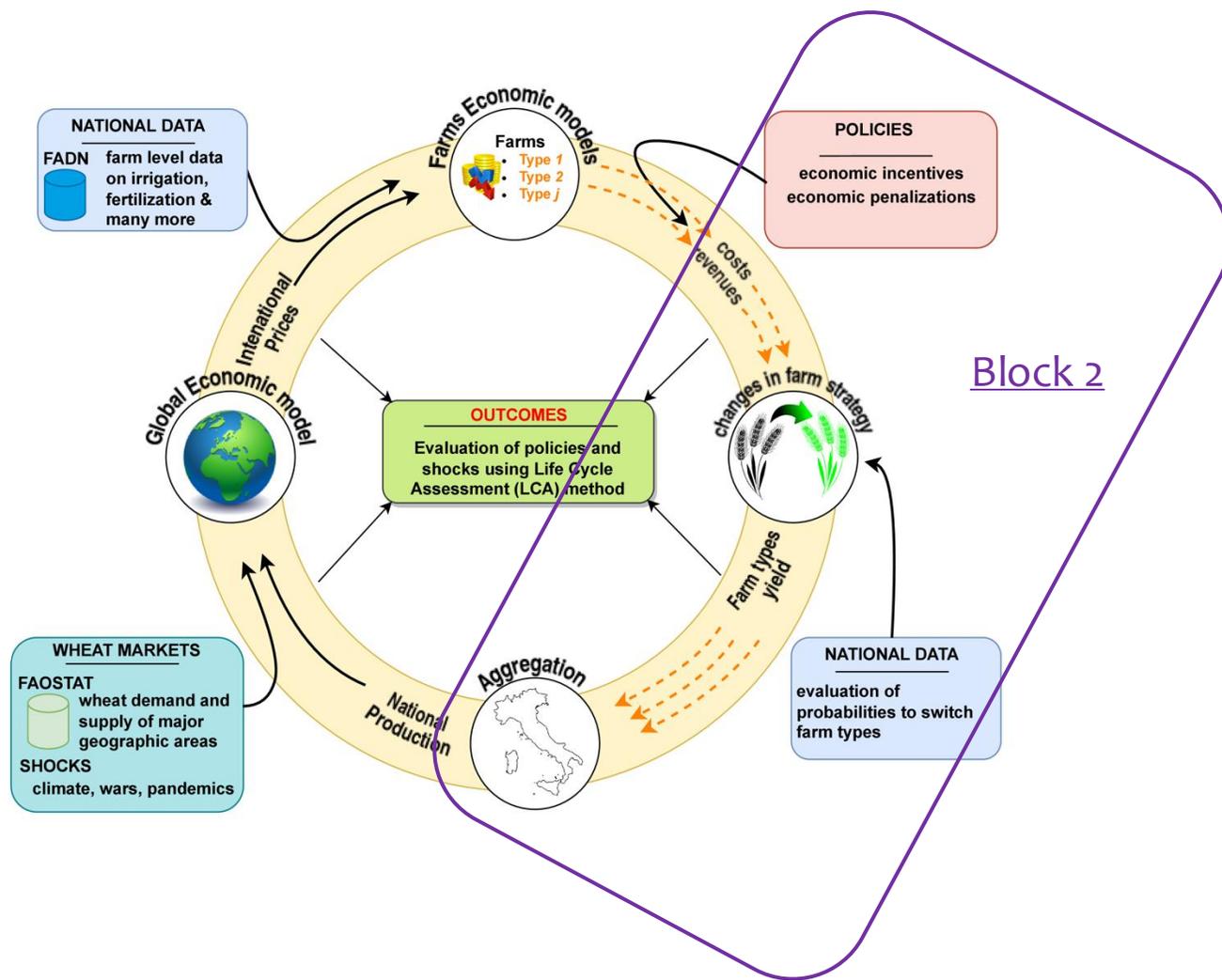
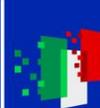


➤ **Task 3.2**

- improve farmers' awareness of sustainability
- **GUI 1:**  
farm economic model + LCA

Deliverable (D2)

April 2025

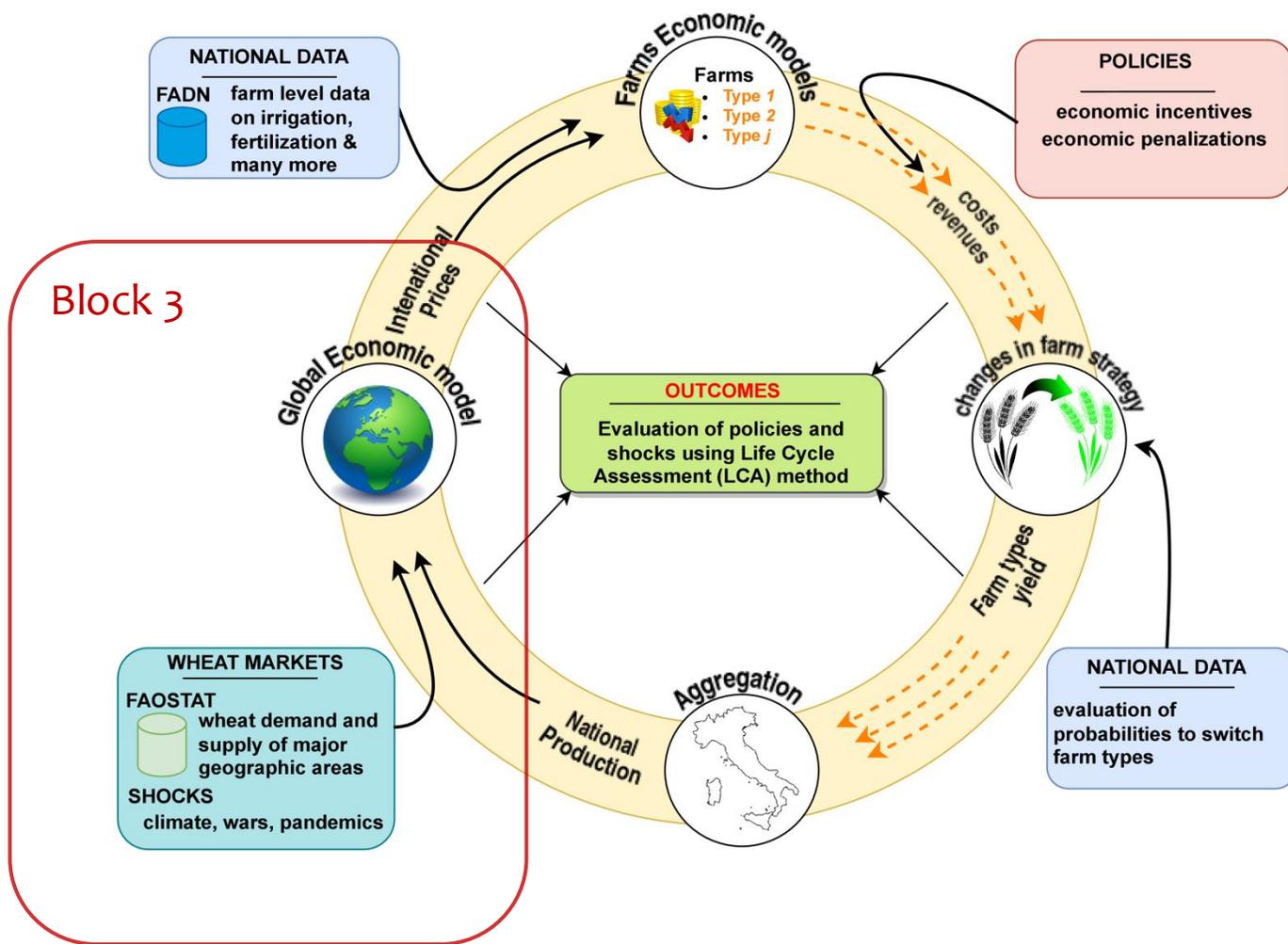


### ➤ Task 3.2

- improve policy makers' awareness of sustainability
- **GUI 2:**  
[green policies + farm economic model + LCA] \* ~320000 + aggregation =  
**Policy impact at the national scale**

Deliverable (D2)

June 2025



➤ **Task 2.3**

- Global and Italian model integration

Task report (I23)  
March 2025



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11.30 - 11.50 Implementazione ABM (Gianfranco Giulioni - UNICH)

11.50 - 12.10 Progettazione della GUI ed aggiornamenti sul sito web (Marco Simonetti,  
Alessandro Manna - CNR)



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EGU General Assembly 2024  
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## Towards Sustainable Agriculture: Classifying the Environmental Impact of Italian Wheat Farming

Gianfranco Giulioni<sup>1</sup>, Concetta Cardillo<sup>2</sup>, Antonella Del Signore<sup>1</sup>, Edmondo Di Giuseppe<sup>3</sup>, **Arianna Di Paola<sup>3</sup>**, Antonio Gattone<sup>1</sup>, Massimiliano Pasqui<sup>3</sup>, Sara Quaresima<sup>3</sup>, Marco Simonetti<sup>3</sup>, and Piero Toscano<sup>3</sup>

10/05/2024 Talk @Pescara



G. & L. E. R., Vol. X, No. X, 20XX

Antonella Del Signore\* - Ilaria Zappitelli<sup>‡</sup> - Concetta Cardillo<sup>†</sup> - Alessandro Ceccarelli\* - Edmondo Di Giuseppe<sup>‡</sup> - Arianna Di Paola<sup>‡</sup> - Antonio Gattone\* - Massimiliano Pasqui<sup>‡</sup> - Sara Quaresima<sup>‡</sup> - Marco Simonetti<sup>‡</sup> - Piero Toscano<sup>§</sup> - Gianfranco Giulioni\*

EVALUATION OF POLICIES FOR ENHANCING SUSTAINABLE WHEAT PRODUCTION IN ITALY

### Abstract

Reducing the environmental impact of food production is one of the greatest challenges to achieving sustainability. The ECOWHEATALY project focuses on the role of policies in providing economic incentives for farms to move from less to more sustainable wheat production techniques, both during stable economic times or periods of crisis. In this context, ECOWHEATALY addresses the complex interactions among socio-economic and environmental factors. This paper provides an overview of both the global and Italian frameworks for wheat production and trade. Additionally, it reviews EU and national regulations related to agricultural policies. Finally, the paper presents an example of how life cycle assessment is applied to illustrate the methodology used for evaluating sustainability.

**JEL CLASSIFICATION:** F18; Q02; Q11; Q18; Q56.

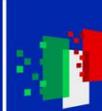
**KEYWORDS:** Intensification of agriculture; Ecosystems; Green policies; Life Cycle Assessment; Food prices.



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Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria

05-07/06/2024 Poster presentation @AIAM24

Atti del XXVI Convegno Nazionale di Agrometeorologia

Approcci innovativi a supporto delle produzioni agrarie in un contesto climatico in evoluzione

L'AQUILA, 5 - 7 Giugno 2024

AN ASSESSMENT OF FERTILIZER AND PESTICIDE TRANSITION TO SUSTAINABLE USE, PART OF THE ECOWHEATALY PROJECT



02/12/2024 Poster presentation @Berlin



Scaling Complexity: High-Performance Computing at the Intersection of Agent-Based Modeling and Complex Networks

AN ABM OF THE ITALIAN WHEAT PRODUCTION SYSTEM FOR GREEN POLICIES EVALUATION

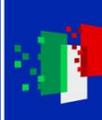
THE ECOWHEATALY TEAM



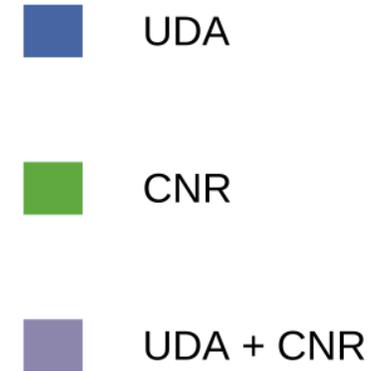
# Annual Modeling and Simulation Conference (ANNSIM)

May 26-29, 2025

Complutense University of Madrid, Spain



Task Name	Task #	Year 1	Year 2	Year 3
Identification of farm type and green policies	1.1	I11		
LCA setup	1.2	I12		
Global Economic Model adaptation	2.1	I21		
Modeling Italia wheat system	2.2	D1		
Global and Italian models integration	2.3	I23		
Simulation in tranquil times	3.1		D2	
LCA evaluation in tranquil time	3.2		D2	
Simulations with global shocks	4.1		D3	
LCA evaluation with shocks	4.2		D3	
Project coordination and amministration	5.1	GA	GA	GA
Communication, dissimination and exploitation	5.2	M1	M2	M3



30 January 2025

27 Sept 2025  
(project ending)

April 2025



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Consiglio per la ricerca in agricoltura  
e l'analisi dell'economia agraria

# Thank you for attending

Missione 4  
Istruzione e  
Ricerca

## ECOWHEATALY

Evaluation of policies for enhancing sustainable  
wheat production in Italy

PRIN MUR 2022