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Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA

UNIVERSITÀ DEGLI STUDI DELLA TUSCIA — DIPARTIMENTO DI SCIENZE AGRARIE E FORESTALI

Missione 4 Istruzione e Ricerca

Economic analysis using FADN data

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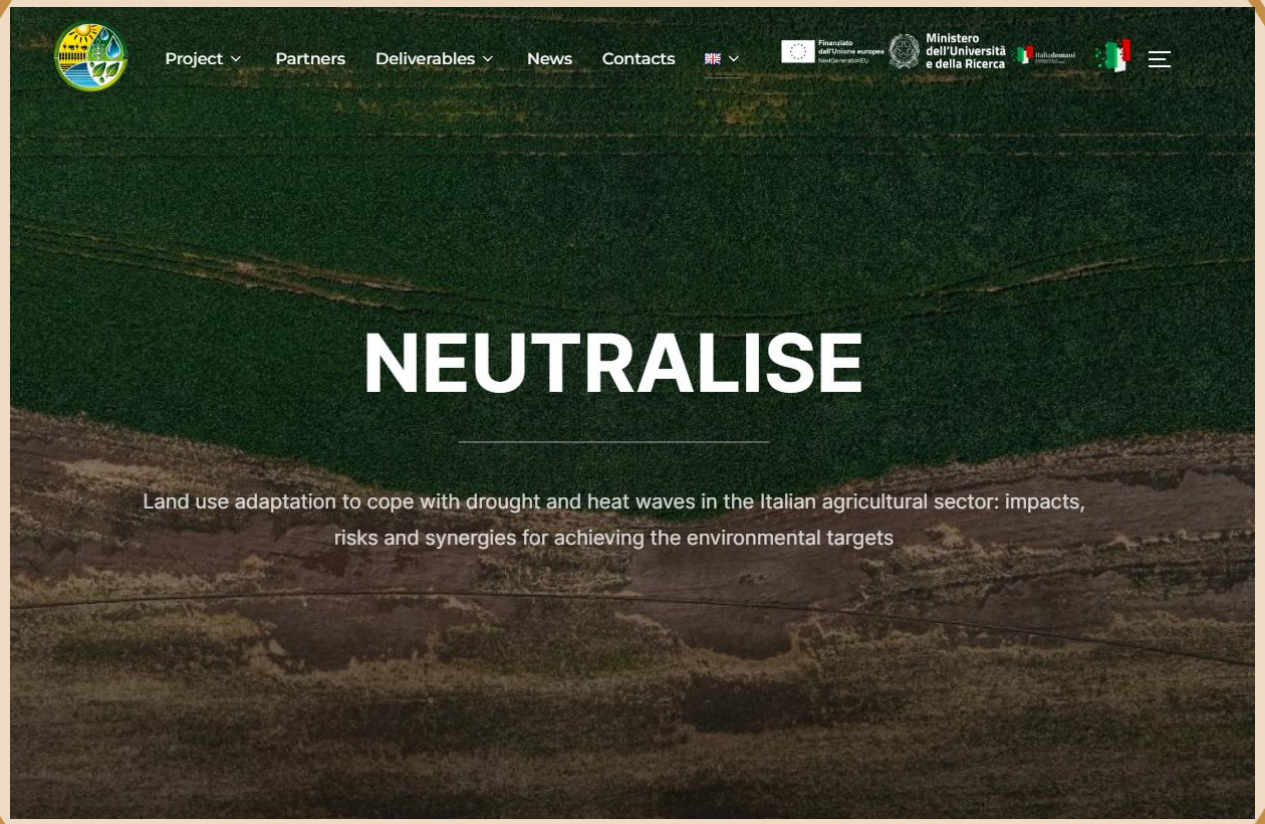


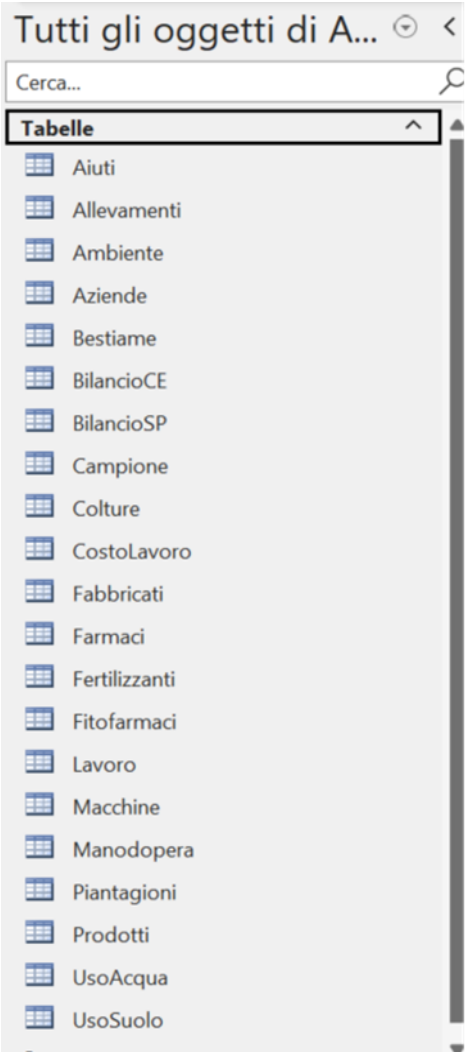
Types of economic analysis

1. Statistical and descriptive (farms, sector, regions, areas,…)
2. …

n-1. Econometric: economic relations from observed data

n. **Ex-ante evaluation by way the use of mathematical programming models: reconstruction of situations with observed data and then simulations of at least one change**

- ✓ **short-medium term economic analysis to assess the impacts on current farms and evaluate possible strategies and policies**



FADN - Farms Accounting Data Network

Structural, productive and economic data of farms

- prices and quantities (output ed input)
- depreciation
- payments and rules of policy
- use and availability of resources
  - land
  - labour (manual, mechanic)
  - labour (farm, external)
  - water (for different sources)
  - ...
- feeding of animals

AGRITALIM model

Simulated scenario 1
⋮
Simulated scenario n

- Land use and agricultural productions
- Economic, environmental and social indicators

Total Italy | Geographical areas | Regions | Farm Types

Key words	Description
AGRIcultural	ALL FADN FARMS – AGRICULTURAL SECTOR
Territori**AL**	NUTS (1, 2 and 3) – ALTIMETRIC LEVELS
t**I**me	2015 – 2022 PERIOD
econo**M**ic	INCOME – EFFICIENT ALLOCATION OF RESOURCES

Main components of the objective function: parameters (market, production function, policy) and variables

Components	Market	Production function	Policy	Variables
Gross Saleable Production - crops	prices	yields		hectares of crops
Gross Saleable Production - animals	prices	yields		number of animals
CAP coupled payments			payments	hectares of crops, number of animals
CAP decoupled payments			payments	
Complementary activities	total revenues			
Variables costs - crops	prices	quantities		hectares of crops
Variables costs - animals	average costs			number of animals
External labour	prices			hours of labour
Feed purchased	prices			quantity of feed
Pumped water	prices			quantity of water pumping
Depreciation rates observed	costs			
Depreciation rates - tree crops	costs			additional area of tree crops
Depreciation rates - animals	costs			additional area of stables and facilities

Structure of the constraints: left-hand and right-hand sides, involved variables.

Types	Matrix coefficients	Availabilities	Variables
Land		farm land	hectares of crops
Labour	manual and mechanical labour needs	family labour, permanent employment temporary employment, external labour	crops (hectares), animals (number), external labour (hours)
Water	water needs	WUA, natural, artificial, pumped waters	crops (hectares), quantity of water pumping
Tree crops		tree crops area	tree crops (hectares), additional area of tree crops
Stables and facilities	area per animal	Area of stables and facilities	animals (number), additional area of stables and facilities
Feeding	feed needs	Feed produced on farm	crops (hectares), animals (number), purchased feed (quantity)
Productive and non-productive animals	ratio		productive and non-productive animals (number)

Observed situations (Baseline)

Years 2021 and 2022:

- last 2 years in the database
- representations of market conditions and production techniques that are still observed
- “drought” scenarios and therefore large group of irrigated crops and irrigation techniques
- last years of application of the 2014-2020 CAP and therefore full implementation (e.g. convergence of decoupled payments)
- especially for farms at constant sample, the aspect relating to crop rotation is considered
- …

Baseline: farms, UAA, % Irrigated UAA

		2021	2022
n° of farms	North West	2,354	2,343
	North Eastern	2,515	2,500
	Center	1,944	1,937
	South	3,047	3,093
	Islands	1,178	1,210
	Total	11,038	11,083

		2021	2022
UAA in ha	North West	93,586	92,377
	North Eastern	69,236	70,626
	Center	64,834	66,232
	South	75,144	77,092
	Islands	50,121	48,798
	Total	352,922	355,125

		%	%
% of irrigated UAA	North West	48.7	46.9
	North Eastern	36.8	40.1
	Center	9.6	8.9
	South	16.5	16.4
	Islands	9.8	10.0
	Total	26.1	26.1

High presence of non-irrigated crops: pastures, meadows, cereals, herbage,…

Baseline with estimated irrigation needs

water use in M m3	2021	2022	%
North West	66.2	74.1	27.2
North Eastern	66.5	84.2	29.2
Center	27.0	26.4	10.4
South	58.0	60.3	23.0
Islands	26.6	26.0	10.2
Total	244.3	271.0	100.0

irrigation needs in m3/ha	2021	2022	+ % vs North
North West	1,392	1,640	
North Eastern	2,606	2,964	
Center	3,771	3,938	94.3
South	4,119	4,261	111.2
Islands	4,905	4,851	145.9
Total	2,449	2,715	

Simulated scenarios

Variation of irrigation needs according to climate data in different scenarios

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- CAP 2023-2027: reform of first pillar
- volumetric pricing
- reduction of available water