# Evaluation of the RDP contribution to the ‘sustainable management of natural resources and climate action’ in Greece

## Lessons learned from the enhanced AIR submitted in 2019

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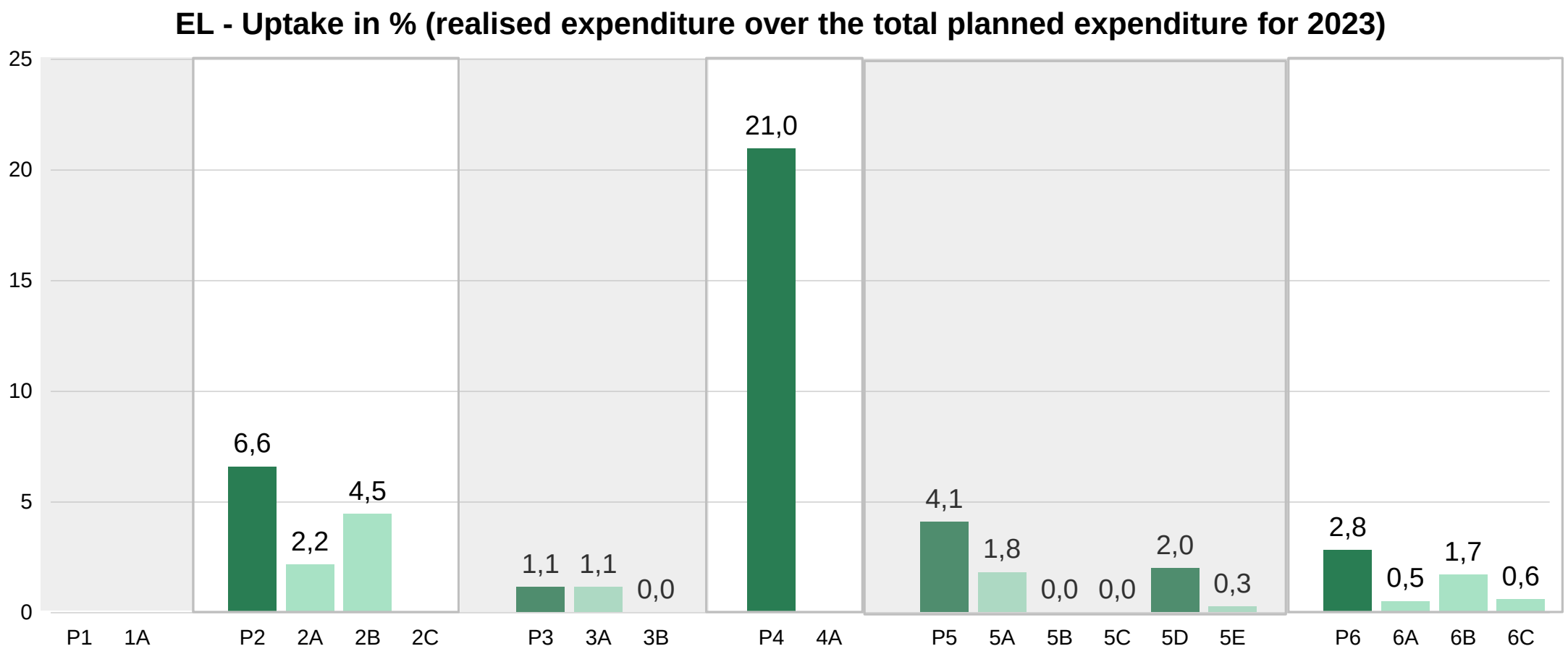
HOW TO DEMONSTRATE RDP ACHIEVEMENTS AND IMPACTS: LESSONS LEARNED FROM THE EVALUATIONS REPORTED IN THE AIRS SUBMITTED IN 2019. 11-12 DECEMBER 2019. SEVILLA (SPAIN)

# Background

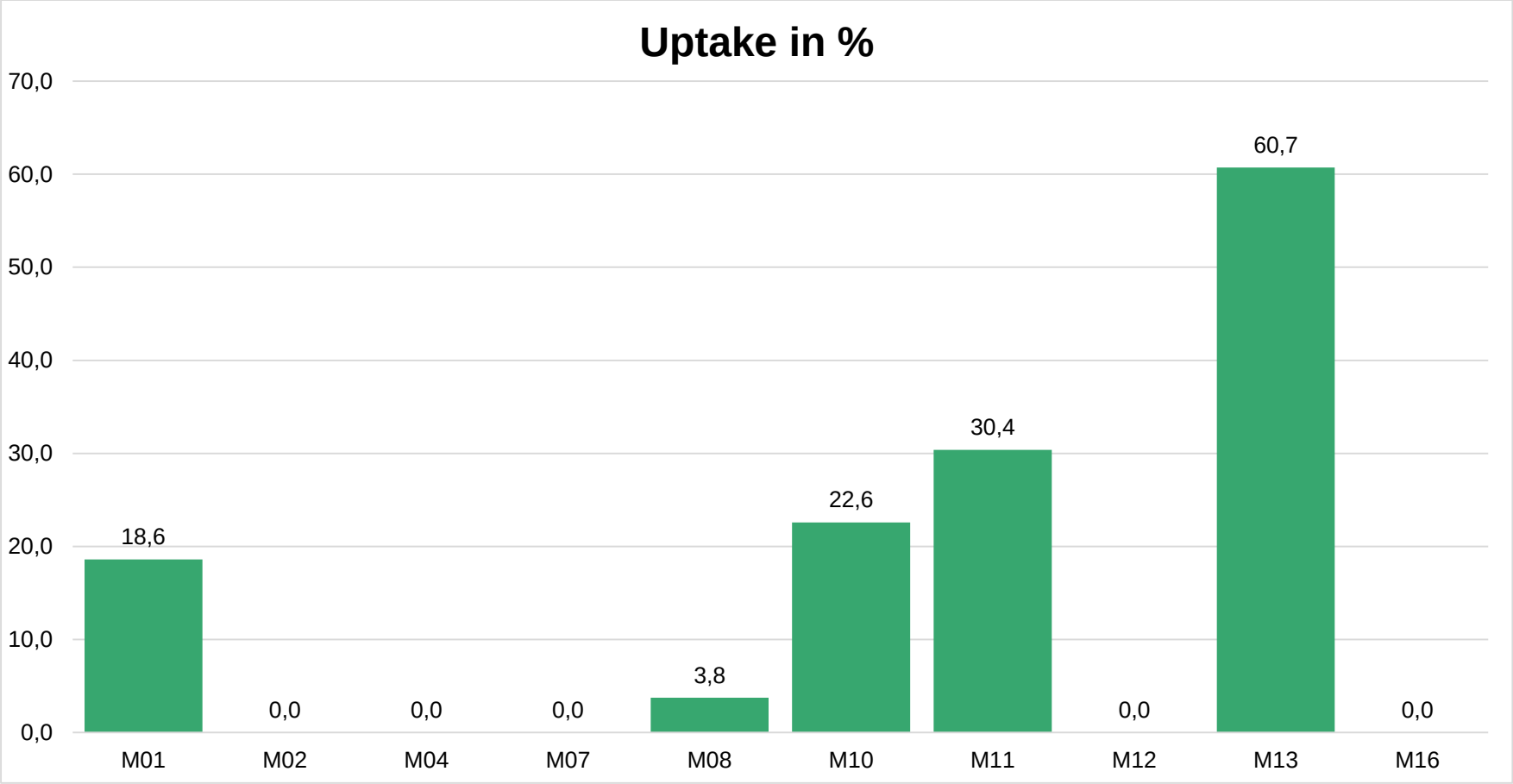
- RDP 2014 -2020 Budget → **5,36 Billion €**
- RDP 2014 -2020 Uptake (%) in Greece → **35,6 %**
- Level of uptake up to 2018 of the Priority P4 (FA: 4A – 4B – 4C) → **40.7%**
- Level of uptake up to 2018 of the Priority P5 (FA: 5A – 5B – 5C – 5D – 5E) → **23.2%**
- Synthesis of the answers of **CEQ 8, 9, 10, 11, 12, 13, 14, 15**
- Inputs from 4 thematic evaluations ( FBI , HNV, WATER , SOIL) carried out at the same time with the RDP 2019 Evaluation ( October 2018 – May 2019)
- Close cooperation and communication among evaluators under MA's coordination
- The methodology was selected on the data availability according to the HD Guidance guidelines

# RDP 2014 -2020 Uptake (%) in Greece



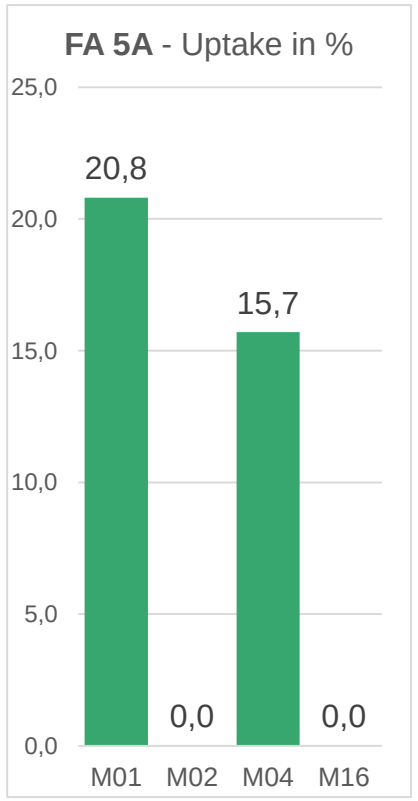
# PRIORITY - P4

Planned expenditure for the **P4: 2.761,56 million euro**

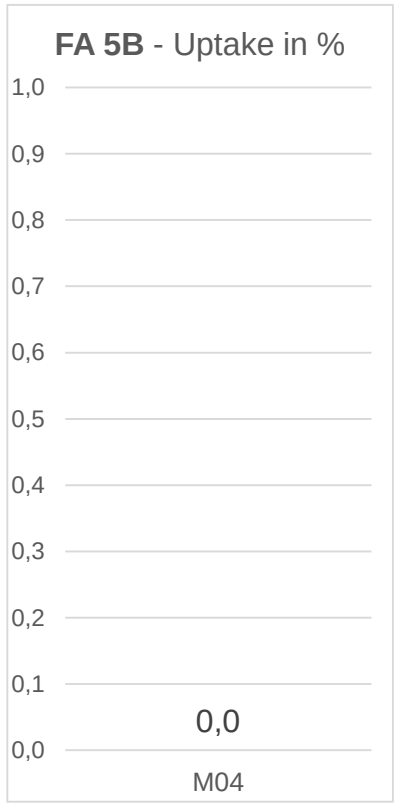


# PRIORITY – P5

Planned expenditure
**FA 5A: 629,72 million Euro**

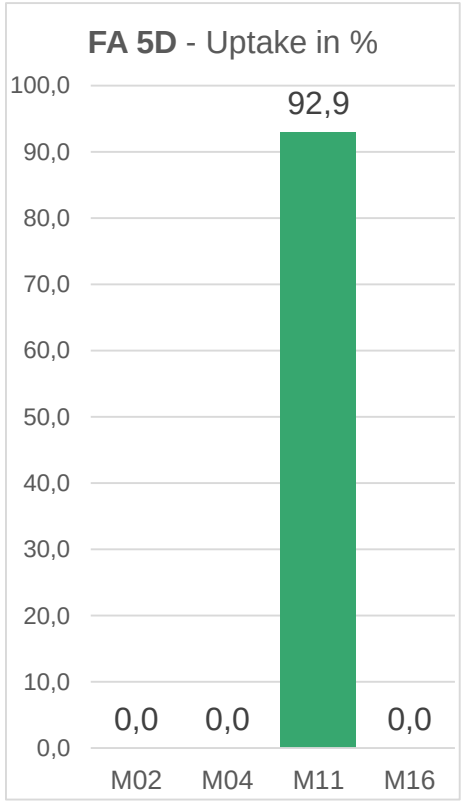



Planned expenditure
**FA 5B: 12,48 million Euro**

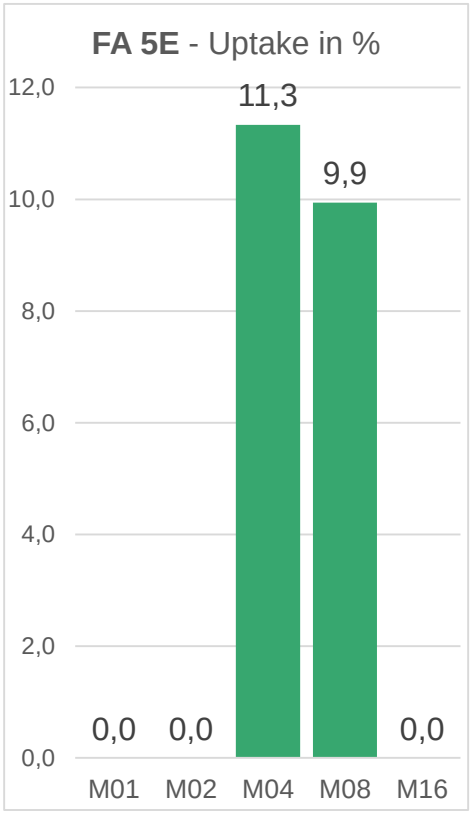



Planned expenditure
**FA 5C: 37,51 million Euro**


Planned expenditure
**FA 5D: 119,29 million Euro**




Planned expenditure
**FA 5E: 147,51 million Euro**

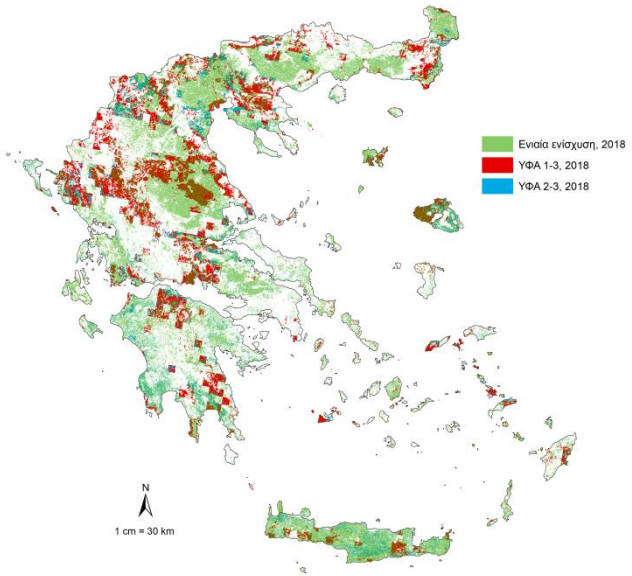


# Approach used to answer CEQ28

| Judgment Criteria | Indicator | Methods | Data |
|---|---|---|---|
| The % of HNV farming land has increased or maintained | I.09 “High Nature Value (HNV) Farming” | Application of GIS to estimate naïve comparison of HNV before and after using shift-share analysis | CORINE, LPIS, Soil Map, Hydrographic Network Map, Habitats Map, Birds Directive Map |
| Water abstraction in Agriculture has been reduced | I.10 “Water Abstraction” | (a) Distributed model for estimating irrigation volumes (b) Matching methods for ATE | Distributed Meteorological Data, Soil Map, LPIS, CORINE, DEM |
| Water quality has improved | I.11 ‘Water Quality” | Naïve calculation of GNB based on cultivations before and after | Water needs (irrigation and precipitation), soil maps, LPIS, Agronomic practices per cultivation |
| The content of organic carbon in soils has increased | I.12 “Soil Organic Matter in Arable Land” | Simulation methods based on the PESERA Model | Land cover, land use, land management (combination of LPIS and CORINE), Climatic and meteorological data, soil and relief data |
| The share of agricultural area affected by soil erosion by water has been reduced<br>Soil loss by water erosion has been reduced | I.13 “Soil Erosion by Water” | Simulation methods based on the PESERA Model | Same as above |
| Farmland bird index has increased or maintained | I.08 “Farm Bird Index” | Not estimated due to lack of data | |

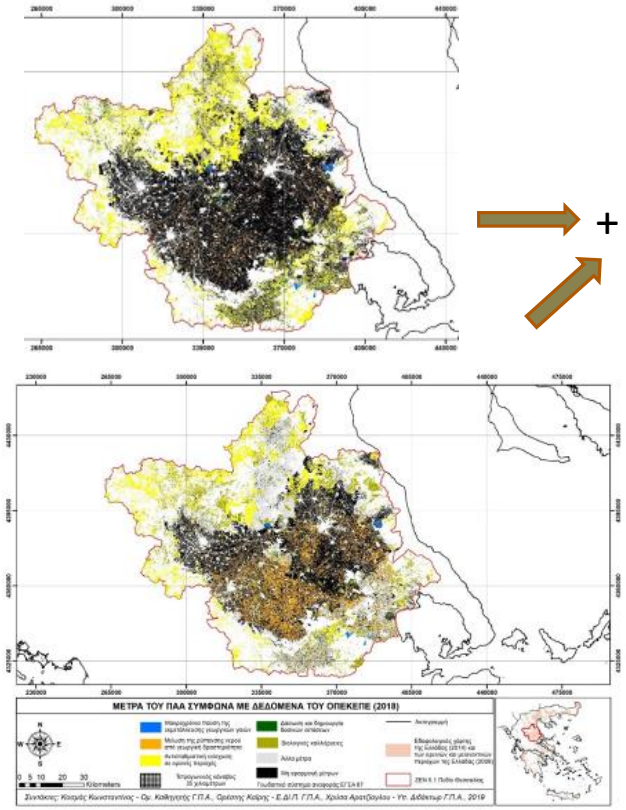
# Short summary of the main findings (1)

**I.09 'High Nature Value (HNV) Farming'**




HNV decreased from 69.04% (2014) to 67.72% (2018) of UAA

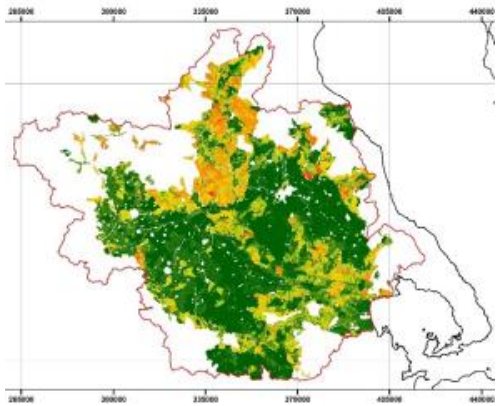
RDP contribution: HNV would have been 7.97% lower without the RDP support




Distribution of RDP measures affecting erosion in 2015 (top panel) and 2018 (bottom panel)

**I.13 'Soil Erosion by Water'**

+ Data → PESERA →



Estimation of Rsoil (risk to soil erosion classes)

Soil erosion decreased from 4.1715 t/ha/year to 4.12 t/ha/year

Soil organic matter increased by 1.52% per year (RDP net contribution at 1.37%) to reach 191.16 megatons in 2018.

# Short summary of the main findings (2)

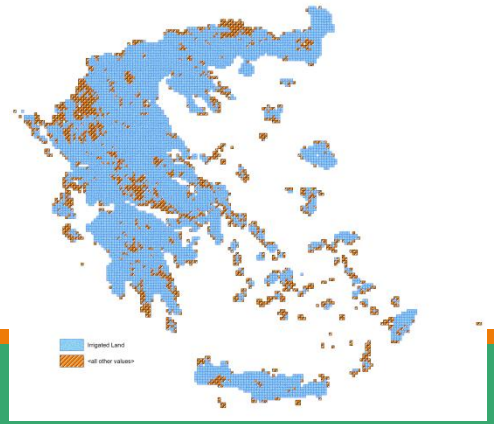
**I.10 'Water Abstraction'**

Data

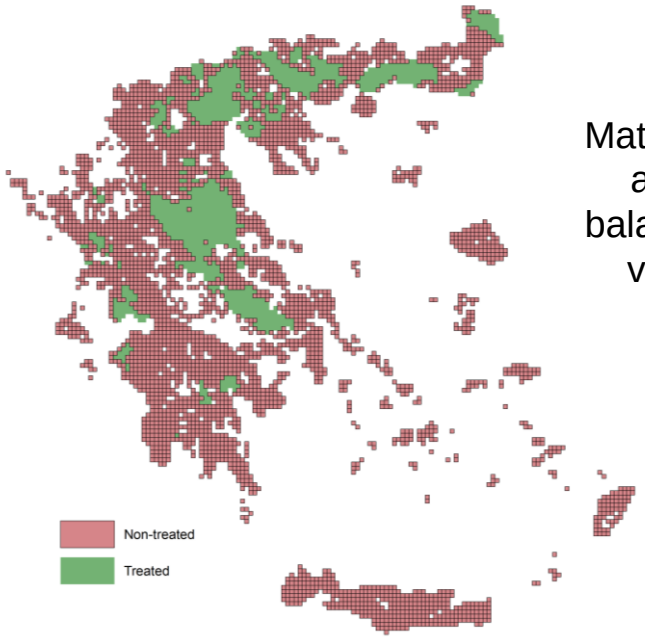
Estimation of Water Needs

Estimation of Irrigation Needs

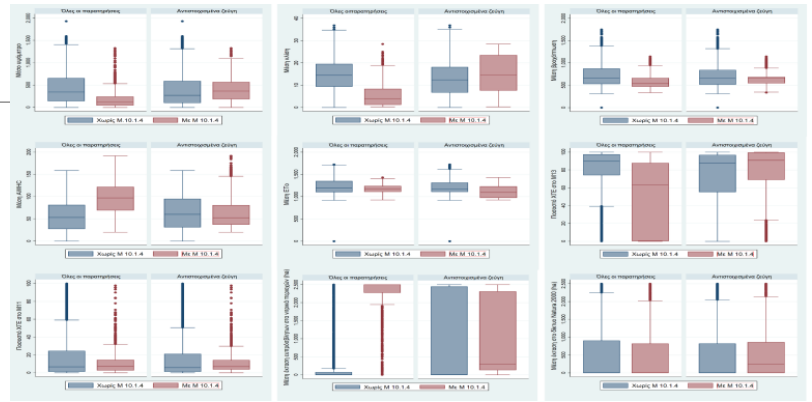
Application to a nation-wide grid of 6,418 squares of 25Km$^2$ each



Eliminate non-irrigated land (4,897 grids) and differentiate between treated (1,044 grids under Measure 10.1.4) and non-treated (3,853 grids)




Matched pairs are fairly balanced on 9 variables



Treatment-effects estimation Number of obs = 4,897
Estimator: propensity-score matching
Outcome model : matching
Treatment model: logit

| Impact Indicator m$^3$/ha | Estimate | Std. Error | z | P>z | 95% CI | |
|---|---|---|---|---|---|---|
| ATE | | | | | | |
| (1=Treated vs 0= Not-Treated) | -852.4591 | 55.3692 | -15.40 | 0.000 | -960.9808 | -743.9375 |

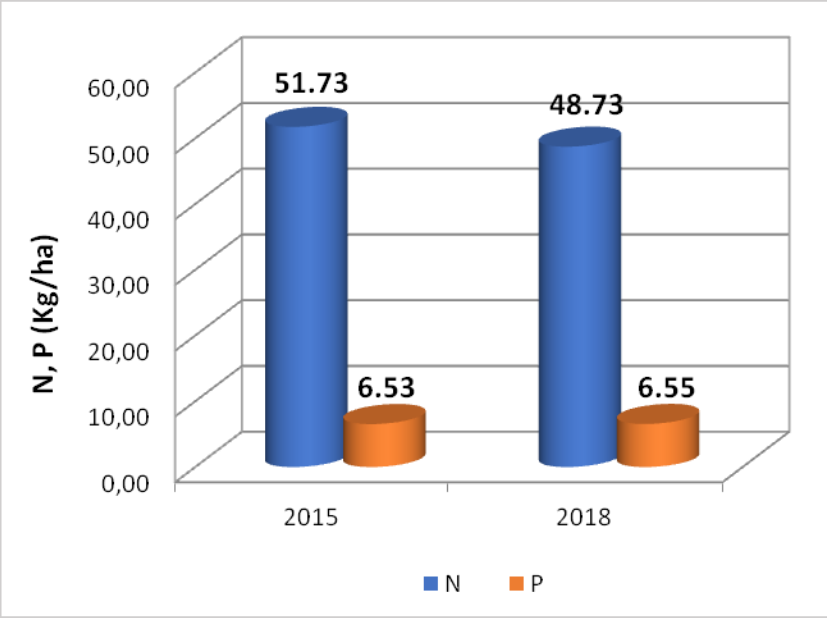
Net contribution of -852.46 m$^3$/ha per year for the beneficiaries in comparison to non beneficiaries (control grids).

Total contribution of 121,331,910.49 m$^3$ per year or 2.6% less of the estimated total irrigation needs (4.683,02 million m$^3$ )

# Short summary of the main findings (3)

I.11 ‘Water Quality’

I.11 ‘GNB – N and P’




The Agricultural University of Athens researchers, using the exact methodology described by Eurostat, found significant deviations between their estimates and what is reported by C.I. 40

I.11 ‘Water Quality - Surface and Groundwater’

| **Groundwater % of Stations** | | |
|---|---|---|
| High quality (<25) | Moderate quality (>=25 and <50) | Poor quality (>=50) |
| 2015 | | |
| 65.32 | 17.76 | 16.92 |
| 2018 | | |
| 70.21 | 14.69 | 15.1 |
| 2015-2018 Difference | | |
| **+4.89** | **-3.07** | **-1.82** |
| | | |
| **Surface water % of Stations** | | |
| High quality (<2.0) | Moderate quality (>=2.0 and <5.6) | Poor quality (>=5.6) |
| 2015 | | |
| 84.05 | 12.58 | 3.37 |
| 2018 | | |
| 84.58 | 13.55 | 1.87 |
| 2015-2018 Difference | | |
| **+0.54** | **-0.97** | **-1.50** |

# Main limitations of the approach

**Data limitations in Greece**

- FBI is not regularly measured. FBI is sensitive to climatic and weather variations and need to be measured yearly in order to extract average 3-year or 5-year moving measurements and smooth variation;
- No regular soil survey and incomplete soil maps especially for non-arable land. These data are essential for the application of the PESERA model;
- Different values for context indicator estimations between 'Eurostat' and national experts. (e.g. GNB, Water Abstraction)

**Methodological limitations of matching methods**

- Difficult to differentiate between RDP and non-RDP recipients due to the widespread adoption of certain measures. However, widely adopted measures such as M.13 can be included in the covariates of matching algorithms;
- In certain situations (e.g., water abstraction) the treatment may not be dichotomous, i.e., recipient of support vs. non-recipient but it may be continuous, i.e., area under an agri-environment measure. In this case, a DRF (Dose Response Function) model framework is statistically more appropriate but more demanding.

# Recommendations for the RDP ex post evaluation in 2023

- Nitrate control programs could have even greater impact if they sought external and internal synergies:
  - External synergy is a joint action with other non-RDP-dependent actions in vulnerable areas. (It is ineffective to spend money on reducing nitrates of agricultural origin, when in the same areas, there are extensive settlements operating on problematic sewers);
  - Internal synergy means common action with other RDP actions (i.e. nitrate pollution measures save water, they could also be combined with biodiversity measures).
- For climate change and biodiversity, analyse the intervention logic of the relevant measures for actions related to the reduction of ammonia emissions and apply/adjust the evaluation methodology for impact assessment based on the available data.

# Thank you!

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