# A multicriteria model for rational water management through the new Common Agricultural Policy rules

A. Kouriati[1], C. Moulogianni[1], E. Lialia[1], A. Tafidou[2], A.Prentzas[1], E. Dimitriadou[1] and T. Bournaris[1],*

1Department of Agricultural Economics, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece
2Department of Mathematics, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece
*Corresponding author: E-mail: tbournar@agro.auth.gr

This study aims to present a decision-making model for rational water use and increased profitability in farms under the new Common Agricultural Policy (CAP) rules.

## The Aim Fulfillment Process

A Multicriteria Model was applied within the 'Measure 16: Cooperation' project.

Data from: **5** farmer groups in nothern Greece → **3** utilize irrigation techniques; **2** rely on drylands

**The model was developed considering:**

a) the new CAP rules
b) proper water management
c) the real producers' objectives

**multi-criteria analysis method** was applied to determine the new land use changes that fulfill the model objectives for each of the five farmer groups.

## Model Specification

**1 VARIABLES**

Each farmer group has a set of variables Xi representing its crops → production year: 2023

**2 4 OBJECTIVES for farmers' decision making process:**

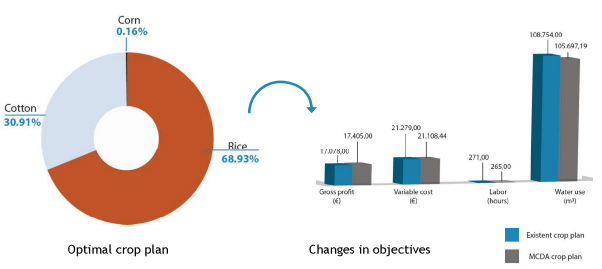
- Profit maximazation: MaxGM = Σ GMi x Xi
- Variable cost minimization: MinGC = Σ GCii x Xi
- Labor minimization: MinLAB = Σ LABi x Xi
- Water use minimization: MinWAT = Σ WATi x Xi

**3 CONSTRAINTS**

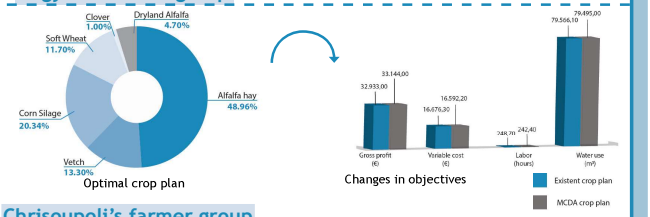
- Total cultivation land: **Σxi = 100**
- Common Agricultural Policy (Fallow Land): **SA=0.1* Σxi**
- Irrigation: **ΣWATi ≤ 0.2 * WATi**
- Market constraints-Other constraints

## Results

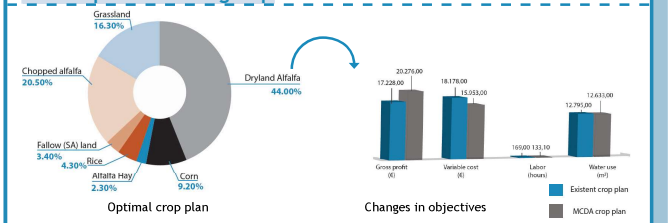
### Chalastra's farmer group



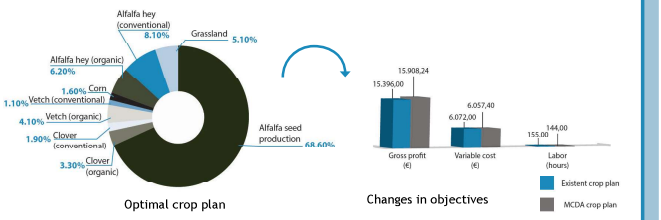

### Lagyna's farmer group



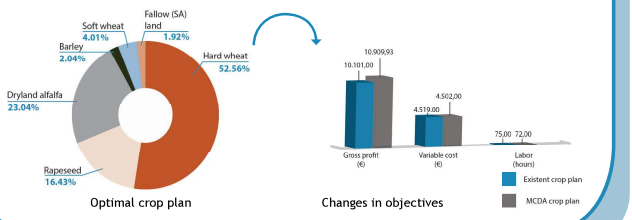

### Chrisoupoli's farmer group




### Kranidia's farmer group




### Mesorrachi's farmer group




## Conclusions

**Increase profits** **Manage water**

Multi-criteria decision analysis → Valuable tool for implementing water use policies, as it can identify optimal land uses and promote more effective irrigation management practices.

**Irrigated Farming:**

Reducing water usage => reducing water-intensive crops (rice-corn-vetch-clover)

↪ adapt to climate change and promote sustainability

**Non - Irrigated Farming:**

reducing vetch, grassland, and sunflower cultivated areas

↪ lead farmers to increase the cultivation of crops eligible for primary CAP subsidies thus enhancing their profitability.

**The model's success relies on the adoption of new land use changes, which will be validated through a future study.**

Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης

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