

# 1st Mediterranean Forum for PhD Students and Young Researchers

Designing Sustainable Agricultural and Food Production Systems  
under Global Changes in the Mediterranean  
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## Agricultural household effects of promoting olive oil production changes for smallholder farmers in dry land area\*

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## Introduction



Drylands

Demographic pressures

Climatic pressures

*Study area*

*Threatening*

Food consumption

Incomes

Natural resources

Sidi-Bouzeid

Food expenditures are 38% lower than national average

It is the poorest region in Tunisia where Farmers and agricultural workers incomes are the lowest

It faces the issue of Ground water overexploitation (835 surface wells abandoned in 2010)

- Today; the challenge for policy makers in dryland region is to **design and assess incentive policies** for rural population livelihoods while preserving the environmental integrity.
- The aim of this work is to assess, by using a **non linear farm household bio-economic model**, the productivity, food consumption and environment impacts of incentive agricultural policy.



## STEP 1

### Question specification and Data Collection

- Regional agricultural activities diagnostic

Local experts interviews + Statistical data + geographical distribution

- Selection of representative farm household types

farm surveys (37)

- Data collection for farm household types description

farm vs field; Consumption vs households structure; Inputs vs production

## STEP 2

### Model description

- **Bio-economic household modeling :**

Non-separable model based on a mathematical program (4)

- **Objective function**

• **MAX U = Global income - Risk**

Self-consumption + Off farm income + Farm income

- **Constraints**

Agronomic, resources, labour and food consumption

*Confronted to stakeholders expectations*

## STEP 3

### Scenario and indicators specification

- **Scenario definition : Better value olive products**

$S_0$

Current situation : without valorisation of olive products

$S_{t=20}$

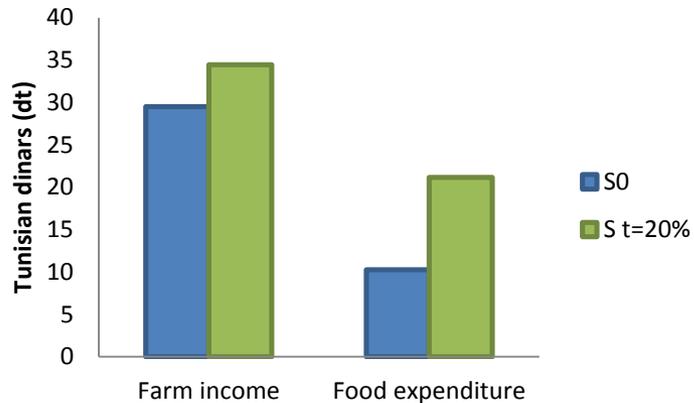
Sale of olive oil with processing and sales expenses = 20% of total cost

- **Indicators definition :**

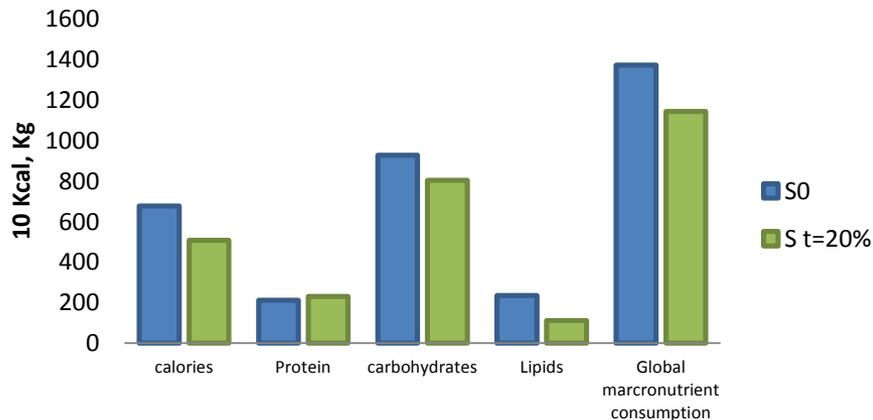
Socio economic; food consumption; agricultural production; environmental

- **Simulation interpretation**

## Résultats et discussions



The opportunity of selling olive oil pushes the household to choose the market for his diet which doubles his food expenditures and decreases his self-consumption.



Despite these increases, household food consumption is quantitatively deteriorated with a global loss of 19% in macronutrient consumption



- **These results reflect disconnection between agriculture and nutrition in Tunisia where farmers foster monetary gain at the expense of food consumption.**
- **The simulation shows that this incentive policy scenario must be accompanied by nutritional measures.**
- **The method used for this study can be applied to other contexts in arid areas where the production is more or less driven by consumption. However; this requires adapting the database and certain constraints of the model.**