

Agricultural household effects of promoting olive oil production changes for smallholder farmers in dry land area*

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Objective and challenges

Climatic and demographic **pressures** in drylands are threatening their inhabitants **food consumption, income and natural resources**.

In **Sidi-Bouزيد**, a Tunisian dry area :

- Food expenditures are 38% lower than national average (1).
- It is the poorest region in Tunisia where Farmers and agricultural workers incomes are the lowest (2).
- It faces the issue of Ground water overexploitation (835 surface wells abandoned in 2010) (3).

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.

The bio-economic model was used on a representative farm household type of the **Sidi-Bouزيد**, Tunisian, case study.

In this area, the **rainfed olive tree** covers over 60% of the agricultural area (3) and is a very low-input crop.

Materials and methods

The general methodology is divided into **three interconnected steps** :

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**

S₀

S_{t=20}

Current situation : without valorisation of olive products

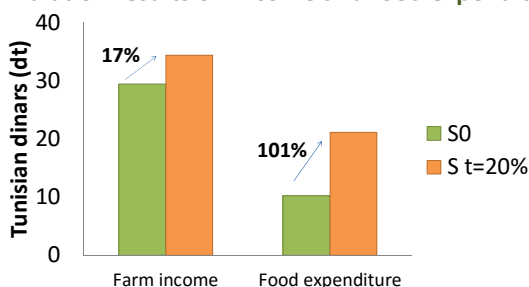
Sale of olive oil with processing and sales expenses = 20% of total cost

• **Indicators definition** : Socio economic; food consumption; agricultural production; environmental

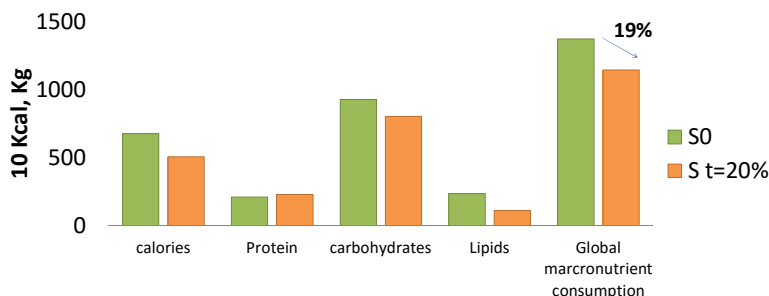
• **Simulation interpretation**

Results

Simulation results on income and food expenditure



Simulation results on household nutrient consumption



- A better valorisation of olive products results in an increase of the household's overall utility by 4000 Tunisian dinars (dt) per year: an increase in farm income by 4950 dt associated to a decline in self-consumption value by 950 dt.
- 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** (5) 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.

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