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-Bouzid, 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-Bouzid, 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**

- 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 income vs head; consumption vs households structure; Inputs vs production

**STEP 2**

- 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

**STEP 3**

- Scenario definition: Better value olive products
- 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

- 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 were the production is more or less driven by consumption. However; this requires adapting the database and certain constraints of the model.

Simulation results on household nutrient consumption

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- The method used for this study can be applied to other contexts in arid areas were the production is more or less driven by consumption. However; this requires adapting the database and certain constraints of the model.

REFERENCES

(3) CRDA-SidiBouzid, 2010, internal document.