



HAL
open science

Environmental impacts of national diets: Comparison of land use and water deprivation impacts in France and Tunisia

Carole Sinfort, Marlène Perignon, Jalila El Ati, Sophie Drogue, Nicole Darmon, Marie Josephe Amiot-Carlin, . Medina Study Group

► To cite this version:

Carole Sinfort, Marlène Perignon, Jalila El Ati, Sophie Drogue, Nicole Darmon, et al.. Environmental impacts of national diets: Comparison of land use and water deprivation impacts in France and Tunisia. 21. International Congress of Nutrition (ICN), Oct 2017, Buenos Aires, Argentina. 1 p., 2017. hal-02785684

HAL Id: hal-02785684

<https://hal.inrae.fr/hal-02785684>

Submitted on 4 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

IUNS 21st ICN International Congress of Nutrition "From Sciences to Nutrition Security"

Buenos Aires, Argentina, 15-20 October 2017 - Sheraton Buenos Aires Hotel & Convention Center
www.iuns-icn2017.com info@iuns-icn2017.com



Reference

144/1812

Environmental impacts of national diets: Comparison of land use and water deprivation impacts in France and Tunisia

Carole Sinfort¹, Marlène Perignon², Jalila El Ati³, Sophie Drogué², Nicole Darmon², Marie-Josèphe Amiot² and the MEDINA study group

¹Montpellier SupAgro, UMR ITAP, ELSA Research Group, Univ Montpellier, France; ²UMR MOISA, INRA, CIRAD CIHEAM and Montpellier SupAgro, France; ³Institut National de Nutrition et de Technologie Alimentaire, Tunisia

Background and Objectives:

- Environmental **impacts of national diets** are often analyzed through Carbon emissions.
- Other impacts are to be considered and new methods and data are available to compute **water deprivation and land use impacts (including biodiversity)**.
- The objective was to use an **hybrid method** combining economical statistics data to production ones to compute and compare environmental potential impacts due to water and land use for the French and Tunisian diets with a **life cycle vision**.

Methods:

• National nutritional enquiries were merged with the international custom data base UNComtrade and the FAOstat one to **quantify the net incoming percentage per country**.

• Yield per crop and per country were used to compute occupied **surfaces** while **blue water consumptions** were extracted from the Water Footprint Network datasets.

• **Characterization factor** for the water deprivation impacts was the Water Stress Indicator from Pfister et al. (2009). Land use impacts were computed from the occupied surface (including land occupied by animal feed crops), from land use types and from the main biome of the production country. Then LANCA characterization factors (Beck et al., 2011; Bos et al., 2016) were applied to compute land use potential impacts. Biodiversity impacts from land use were obtained from Chaudhary et al. (2015).

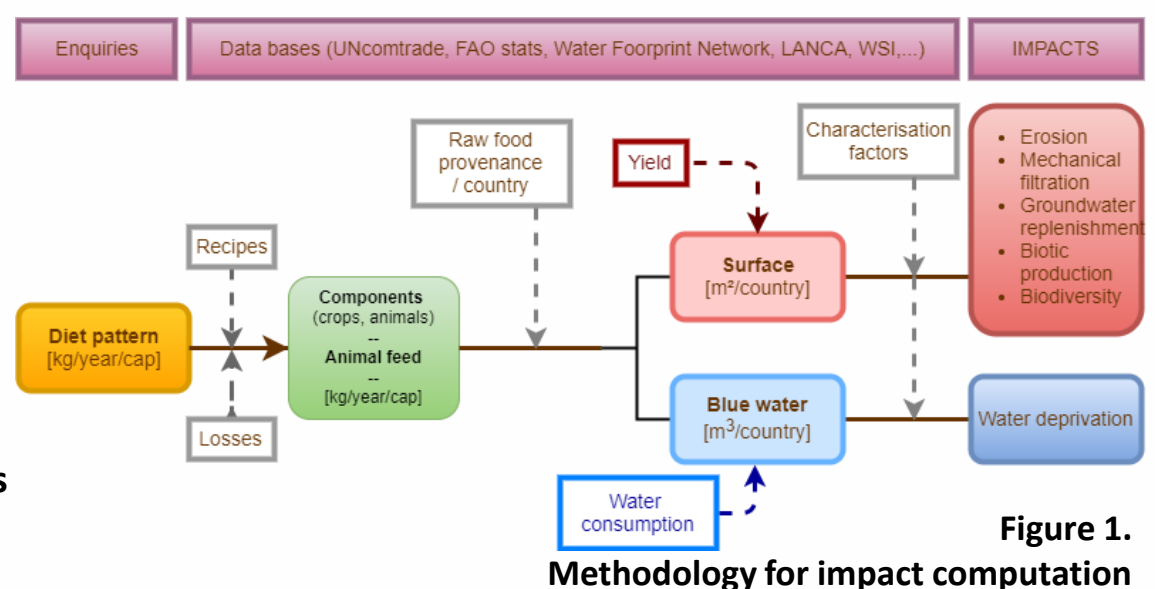


Figure 1.
Methodology for impact computation

Results:

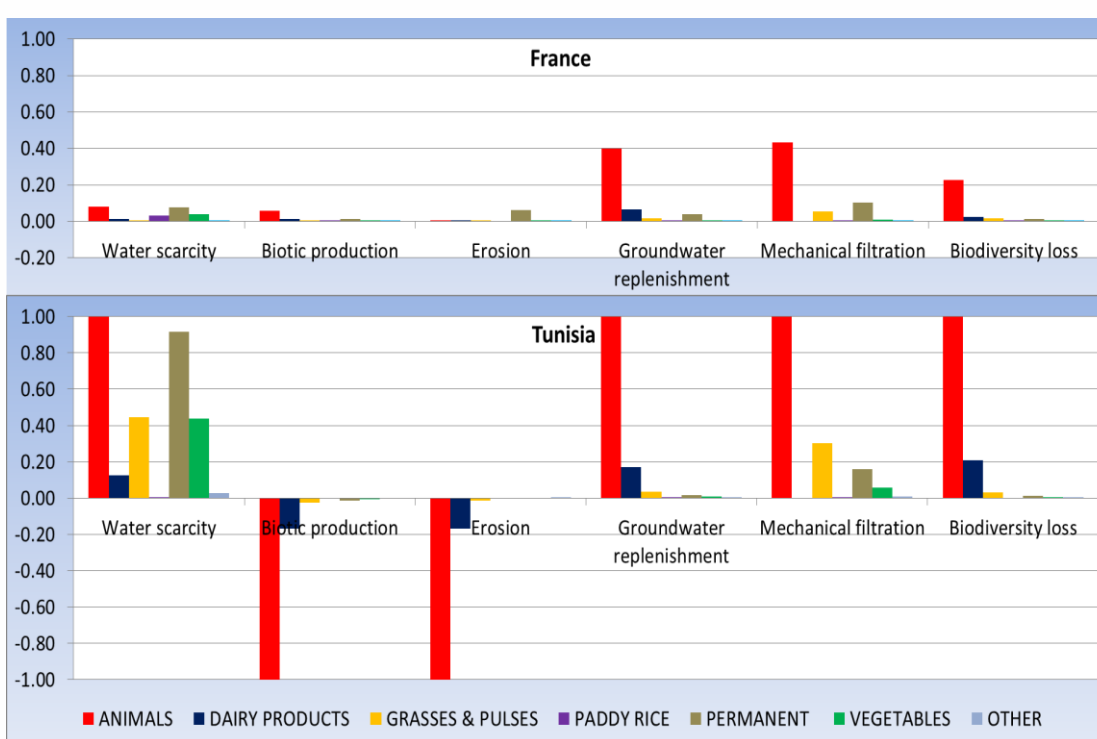


Figure 2. Normalised impacts for the food consumption per person in France and in Tunisia

Conclusions:

- While determining the origin of each food component, global impacts were obtained for the French and the Tunisian diets, for water consumption and land use
- These values, associated to climate change impacts (evaluated through Carbon footprint) provide a tool to improve diets while considering the most important environmental impacts for food production.

Keywords: national diet, life cycle assessment, land use, water deprivation

Further Collaborators: The MEDINA-Study Group includes N Achir (CIRAD), L Alouane (INNNTA) J El Ati (INNNTA), S Bellagha (INAT), PM Bosc (CIRAD), M Broin (Agropolis), N Darmon (INRA), C Dhuique-Meyer (CIRAD), MC Dop (IRD), S Drogué (INRA), S Dury (CIRAD), A Ferchoui (INRA), Gaillard C (CIRAD), Z Ghrabi (INAT), F Jacquet (INRA), Y Kameli (IRD), F Kefi (CIHEAM), E Kesse-Guyot (INRA), D Lairon (INSERM), Y Martin-Prevel (IRD), C Méjean (INRA), C Mouquet (IRD), S Njoumi (INAT), M Padilla (CIHEAM), C Sinfort (SupAgro), P Traissac (IRD).

Fundings and Conflict of Interest : This work was funded by the French Research Agency (ANR-12-TMED-0004). The Tunisian dietary data were collected in the framework of the "Transition And Health Impact in North Africa" project financed by the EU (Contract Number: ICA3-CT-2002-10011). No conflict of interest to declare.

- Total surfaces and blue water needed for the food of one person during one year are :

| | Total surface (ha) | Blue water (m3) |
|---------|--------------------|-----------------|
| France | 0.53 | 31 |
| Tunisia | 6.77 | 102 |

- Main potential impacts are linked to **animal production** in both countries (Fig. 2).
- The **higher impacts are observed in Tunisia** but, for erosion and biotic production, impacts are negative, i.e. beneficial (Fig. 2).
- **Water deprivation** impacts are important for all crops in Tunisia (Fig. 2).