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INTEGRATION OF CONSTRAINTS LINKED TO WATER AVAILABILITY, ACCESSIBILITY AND DEMAND IN SPATIAL FOODSHED MODELS.

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CONTEXT

Global challenges in the agri-food sector

- Worldwide, the demand for food will probably double by 2050[b], particularly in cities that already consume 70% of the global food supply[c] ;
- Societies depend on large-scale, long-distance transportation of food[a].

Global challenges about water resources

- **Water** is a vital resource for sustainable agricultural development[d], agriculture being **rainfed for 75%**[e] and responsible of the **70% of withdrawals**[f];
- **Irrigated agriculture** provides 40% of the global food supply on 20% of cultivated land[g]
- Since 2000, **52% of the irrigation** expansion has occurred **in water-stressed areas**[h]

The prospect of regional and local food systems has gained popularity[i], also studied under the name "FOODSHEDS", the geographic area that supply food to a population center[a]

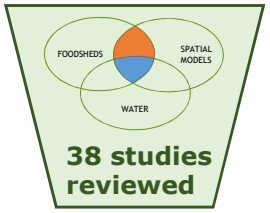
([a]Peters et al. (2009); [b]Dinar et al. (2019); [c]Fao.org; [d]Chartzoulakis and Bertaki (2015); [e]Reddy and Syme (2015); [f]McDaniel et al. (2017); [g]United Nations (2012); Fitton et al. (2019); [h]Mehta et al. (2024); [i]Kaufmann et al. (2022))

How to take into account water resources in the spatial modelling of foodsheds?

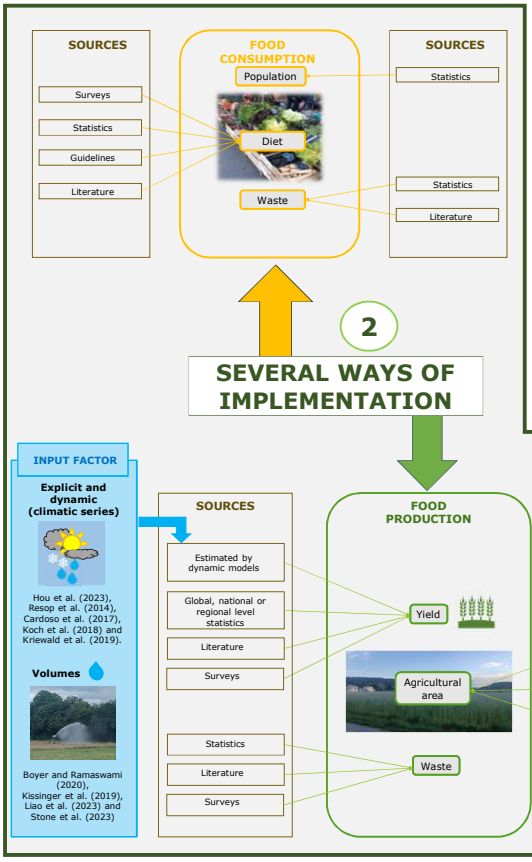
MATERIAL AND METHODS

1. We **systematically reviewed literature** of foodshed models in order to identify spatialized approaches that could be used or adapted to take into account availability, accessibility and demand of water.
2. We propose as well a new conceptual, analytical and operational framework for scholars and land managers through **conceptual and informatic modelling**

PRELIMINARY RESULTS



1 ONE COMMON CONCEPTUAL MODEL



3 DISCUSSION ABOUT WATER IS LIMITED

Only 9 articles where water was a topic

CONCLUSION & PERSPECTIVES

NO EXPLICIT REFERENCE to **ALL** the constraints and diversity of **WATER FACTORS COMBINED TOGETHER** :

PARTICULARLY IN MEDITERRANEAN OR SEMI-ARID CONTEXTS

a scarce resource subject to multiple uses

spatial distribution

- ✓ Spatial allocation of crops
- ✓ Food production level
- ✓ Spatial characteristics of the foodsheds

We propose to develop an INTEGRATIVE FOODSHED MODEL with a SPATIAL and TERRITORIAL approach to a case study in Occitanie (work in progress)