

# How circular is society's consumption pattern:

## A Greater Geneva perspective on food

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SITG, n.d./Bing maps, n.d.

### BACKGROUND

Circular in sustainability debate refers to society's **strict consumption self-sufficiency** in terms of resources (material or energetic) [1]. Defining a societal **metabolic pattern** equates to viewing society as an **autopoietic system**, which reproduces itself by drawing resources from and dumping waste into the environment. Societal metabolic pattern is governed by **three sets of expected relations over interactions occurring: (i) inside structural components (parts); (ii) among functional elements (intersectoral); (iii) between the whole and its context (external)** [2]. Quantifying a society's metabolic pattern allows to assess its degree of **un-circularity** [3,4].

### AIMS

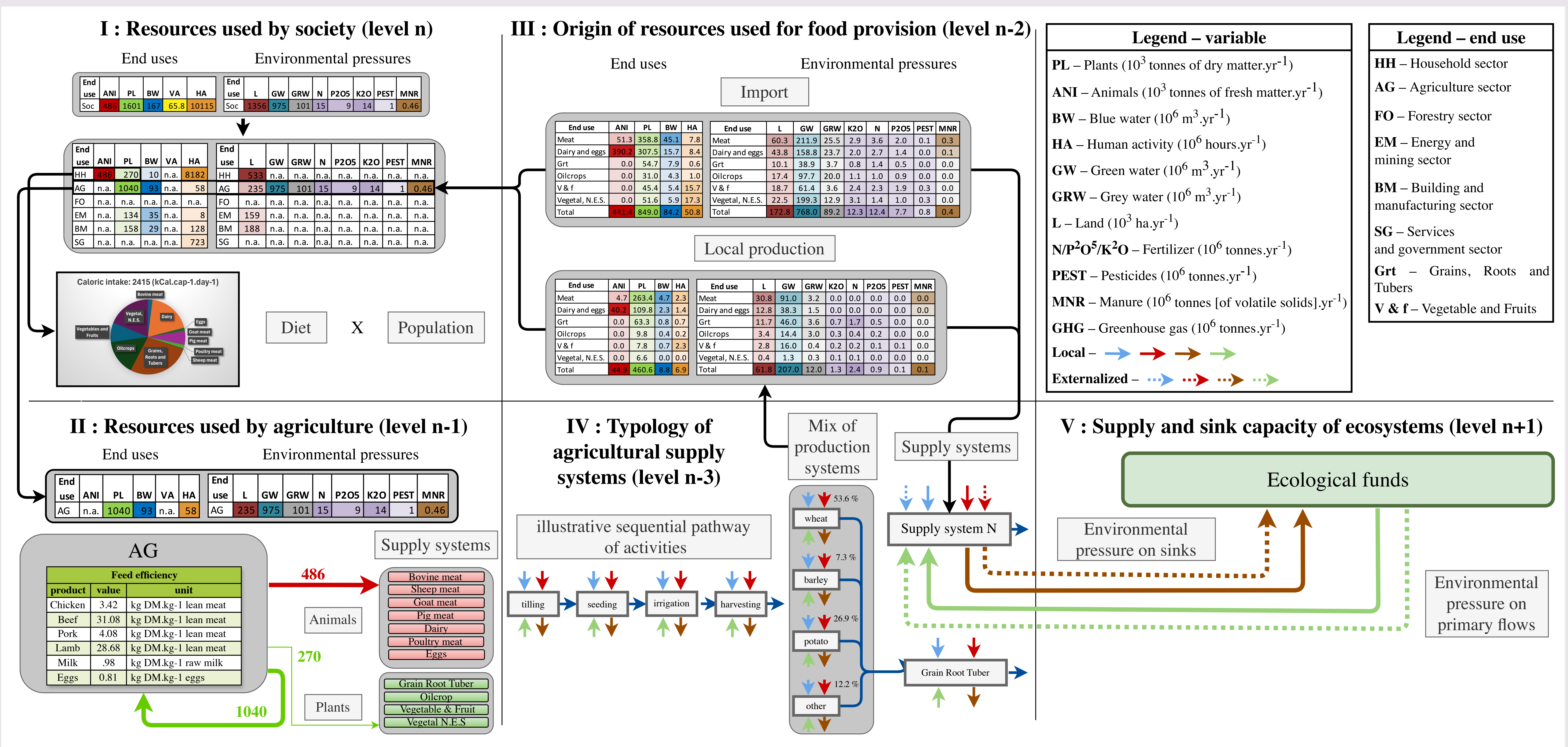
- Develop a **multiscale representation** of Greater Geneva's food system
- Assess **food system internal, inter-sectoral-, and external constraints on societal function of food provision**
- Check **robustness** of national statistics and **operationalize Driver-State-Pressure's** conceptual framework for food in the Geneva region

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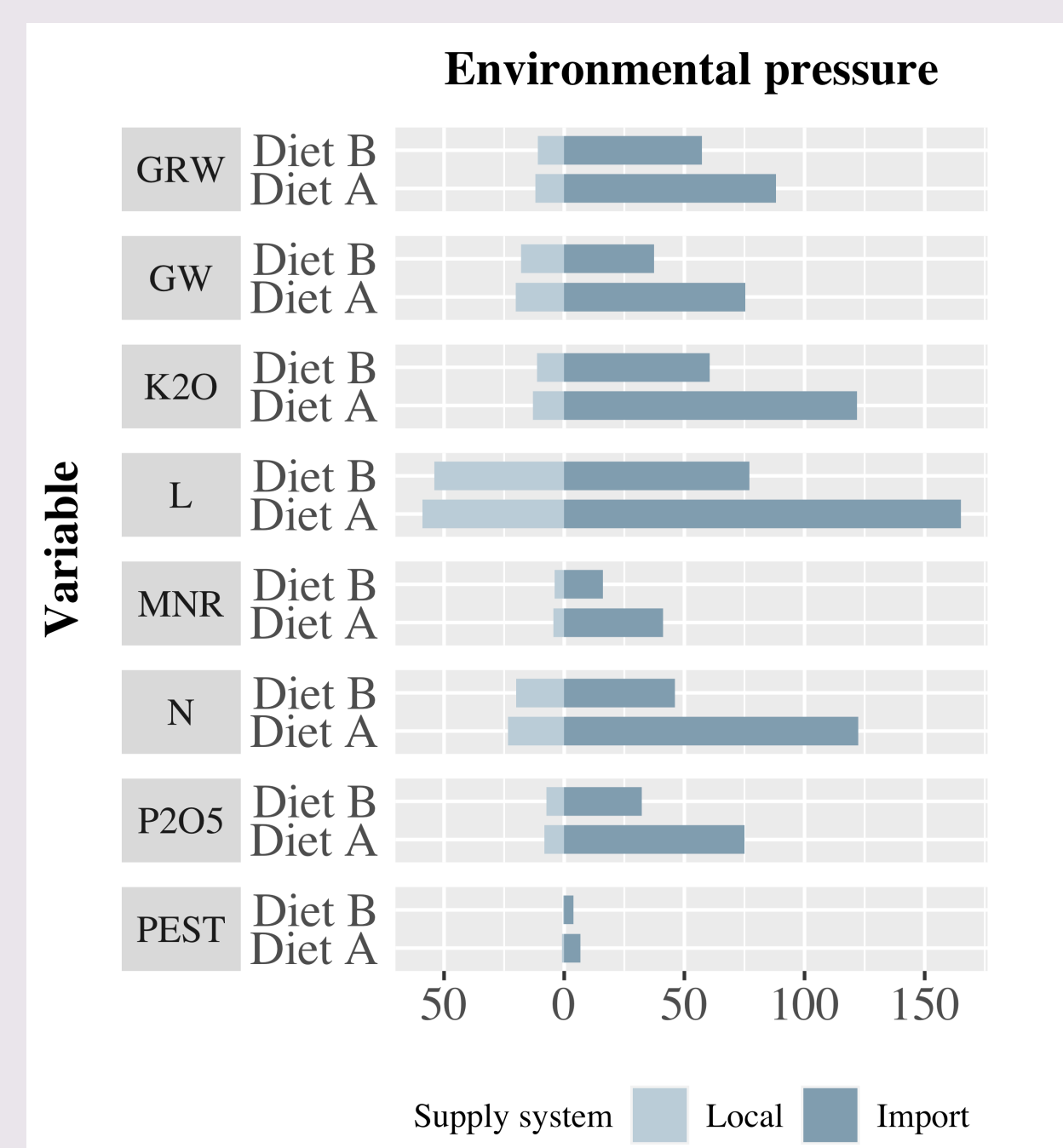
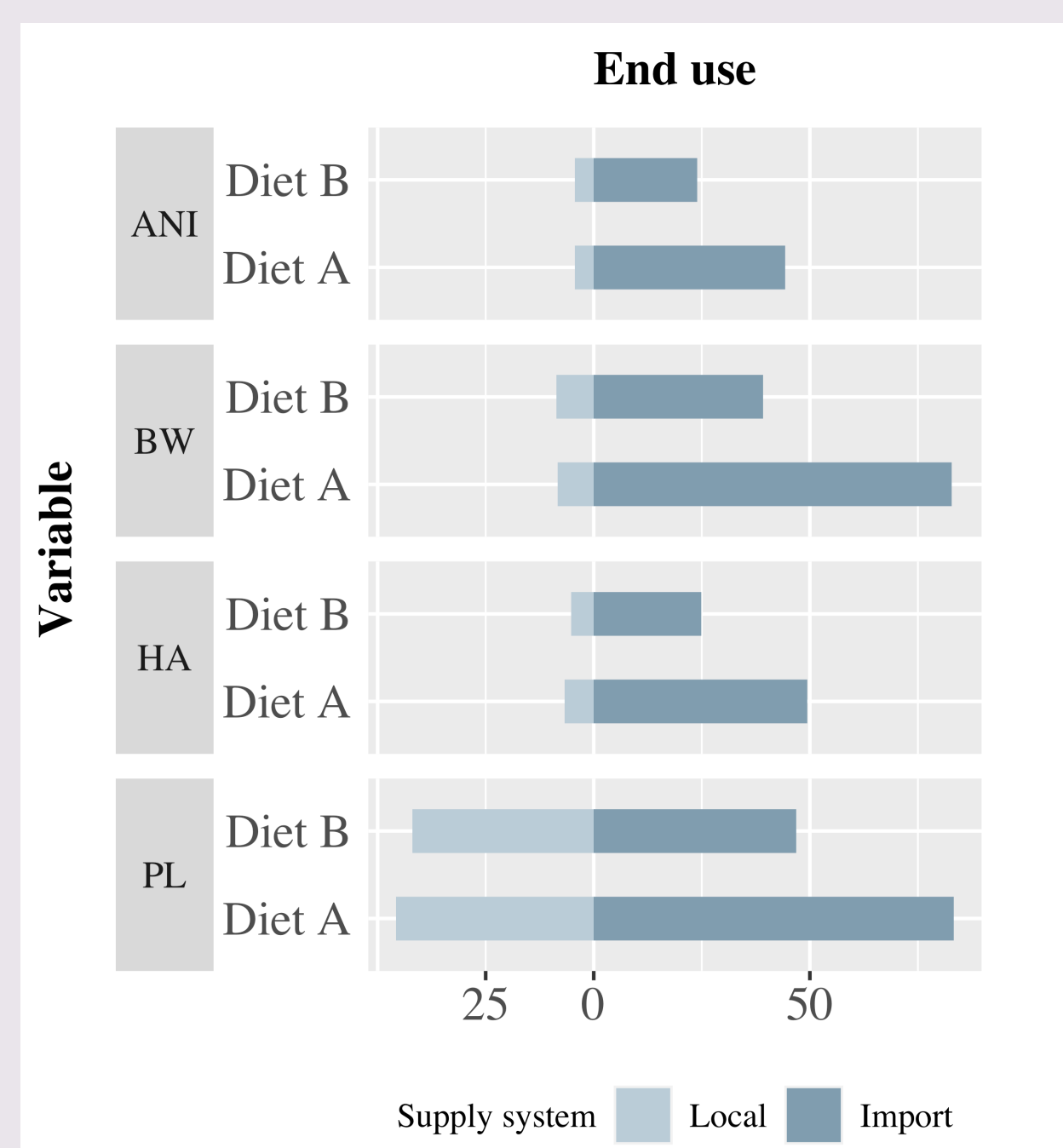
### RESULTS

#### 1. Multiscale representation of Greater Geneva's food metabolism



#### 2. Changes in self-sufficiency and pressures with plant-oriented diet shift

**Diet A:** current  
**Diet B:** plant-oriented



#### Legend

PL – Plants ( $10^4$  tonnes of dry matter.yr<sup>-1</sup>)  
ANI – Animals ( $10^4$  tonnes of fresh matter.yr<sup>-1</sup>)  
BW – Blue water ( $10^6$  m<sup>3</sup>.yr<sup>-1</sup>)  
HA – Human activity ( $10^6$  hours.yr<sup>-1</sup>)  
GRW – Grey water ( $10^6$  m<sup>3</sup>.yr<sup>-1</sup>)  
GW – Green water ( $10^7$  m<sup>3</sup>.yr<sup>-1</sup>)  
L – Land ( $10^3$  ha.yr<sup>-1</sup>)  
N/P<sup>2</sup>O<sup>5</sup>/K<sup>2</sup>O – Fertilizer ( $10^5$  tonnes.yr<sup>-1</sup>)  
PEST – Pesticides ( $10^5$  tonnes.yr<sup>-1</sup>)  
MNR – Manure ( $10^4$  tonnes [of volatile solids].yr<sup>-1</sup>)

### DISCUSSION

- Implementing food consumption circularity by **significantly reducing imports** in Greater Geneva region would require considerably **more agricultural land and agricultural workers** than are currently **available** in society.
- Adopting a more **plant-oriented diet** would markedly **reduce** environmental and social **pressures**.
- This study showed the **potential of MuSIASEM approach** in characterizing a region's food metabolism, yet it **could be applied integrating climate or population drivers or in other domains** to assess a society's **water, energy or human activity** metabolism.

### REFERENCES

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