Addressing food consumption in urban metabolism studies by using the notion of the eating population

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Do current trends in urban food systems prepare them to face this century's challenges of global change ?

Regional specialization in farming

Transformation of consumption patterns

Business-oriented food system governance

MILAN URBAN FOOD POLICY PACT

Increasing urbanisation

Why is it important to quantify the food consumption of a city's population ?

- Need to tailor urban food policy (e.g. sustainable food supply, food waste reduction, diet change) by considering different types of population
- There is no data source that informs about the food consumption of a city's population including residents, tourists and commuters
- Approaches to quantify urban food demand in metabolism studies vary (Goldstein et al. 2016) and are approximate

How can we know how much food the population of a city requires over 1 year?

⇒ conceptualize the eating population consisting of residents, tourists and commuters and their caracteristics in relation to food consumption over 1 year
=> develop a method to capture the types of population, their characteristics and the associated food consumption

The eating population - concept (1)
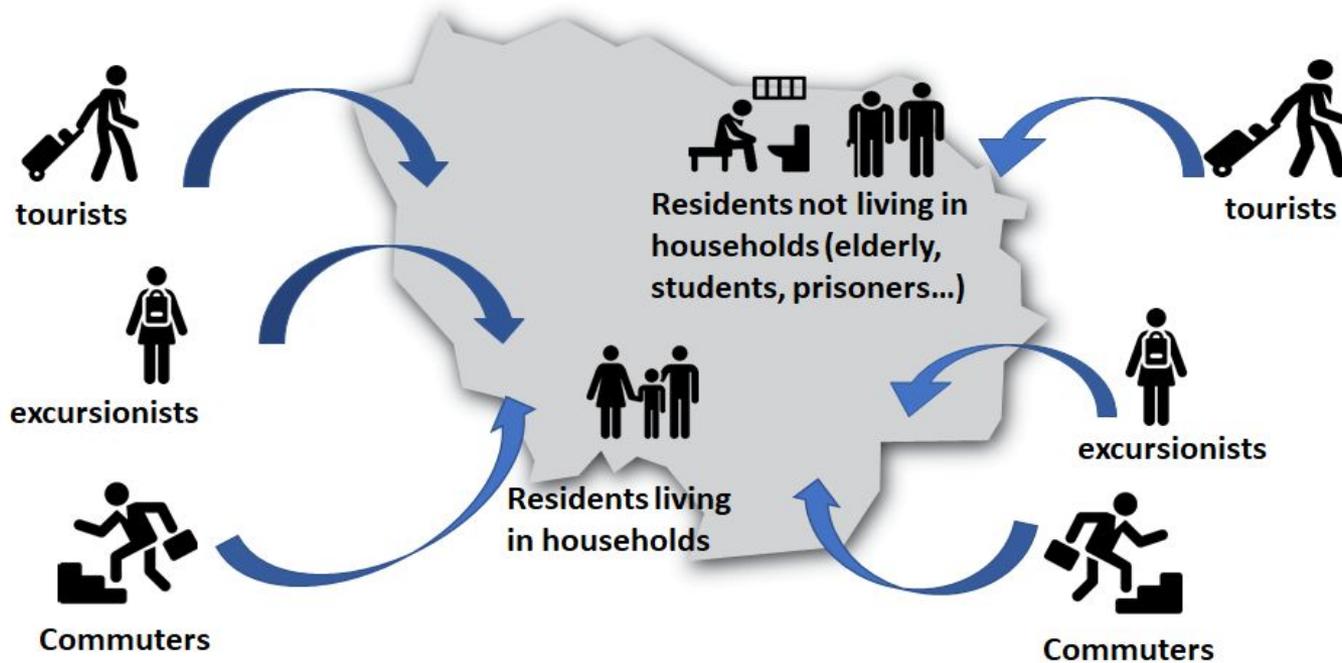
⇒ eating population defined by 3 variables : 1) types of population, 2) time spent, 3) share of daily food intake

⇒ food consumption : eating population x daily food intake

The eating population - concept (2)

Eating population :

$\sum$ of "permanent eating equivalents"

Permanent eating equivalents (PEEQ):

a theoretical person who is present in a given area and takes all of his or her meals there on 365 days per year

Formules :

Eating population = $\sum$ [peeq (i)]

i = population type

peeq (i) = population (i) * time spent in period T (i) (d) / period T (d) * x share of daily food intake (i)

Food consumption (t/T(d)) = Eating population (i) x daily food intake (i) (g/d) x T(d) x 10^6

Operationalization - data sources

Population types
Residents and commuters :
Census data for residents (3
age groups) and their for
commuting;
Tourists: tourist accomodation
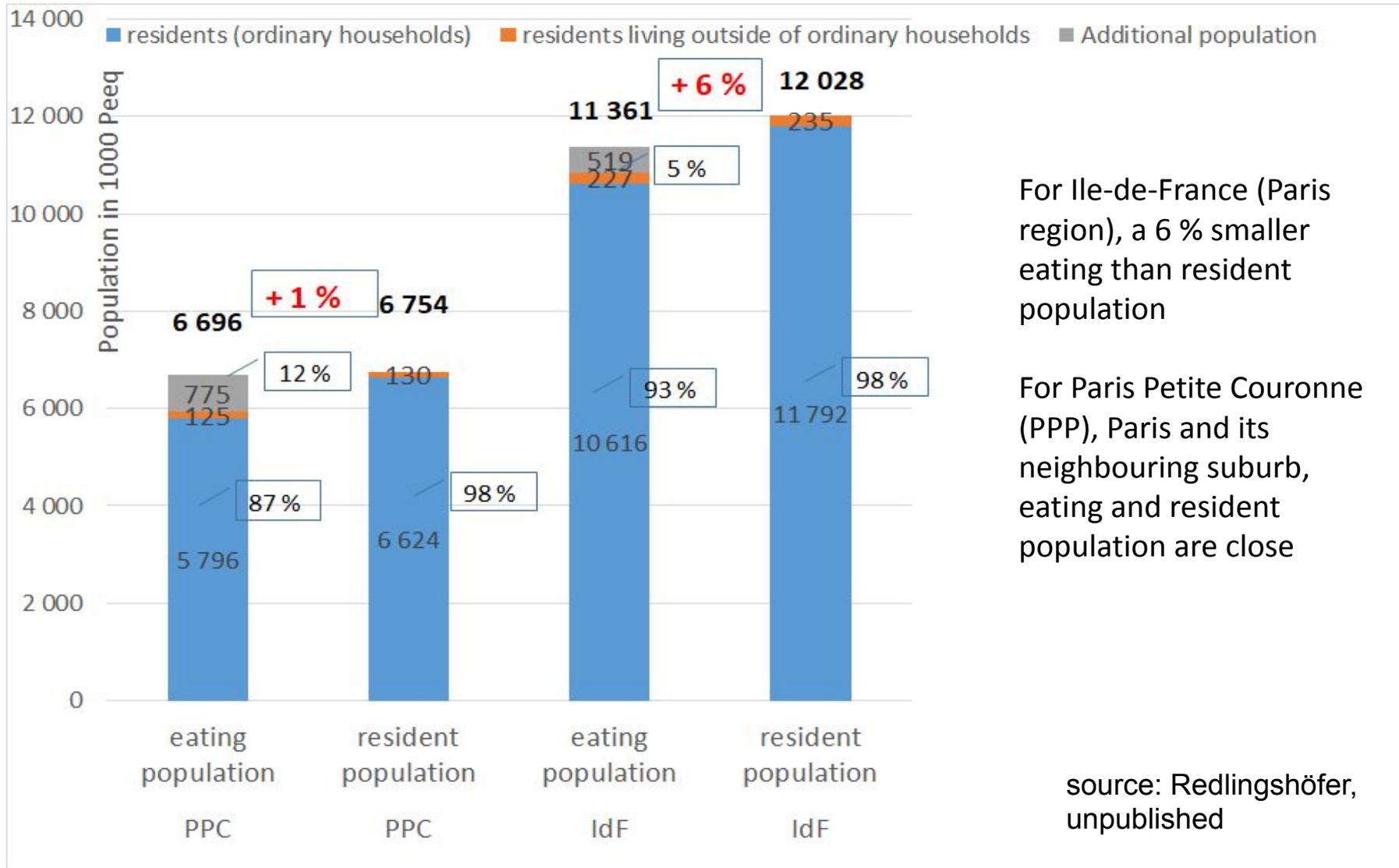data base, occupation rate,
survey data

**Daily food intake and
share of it**
national food intake survey

Time spent
Assumptions based on the
national legal frame for
employment, survey data

For population size, the eating population is smaller than the resident population in the Île-de-France region

For Ile-de-France (Paris region), a 6 % smaller eating than resident population

For Paris Petite Couronne (PPP), Paris and its neighbouring suburb, eating and resident population are close

source: Redlingshöfer, unpublished

Food consumption of the eating population is smaller than the one of the resident population in Île-de-France (slightly smaller in Paris Petite Couronne)
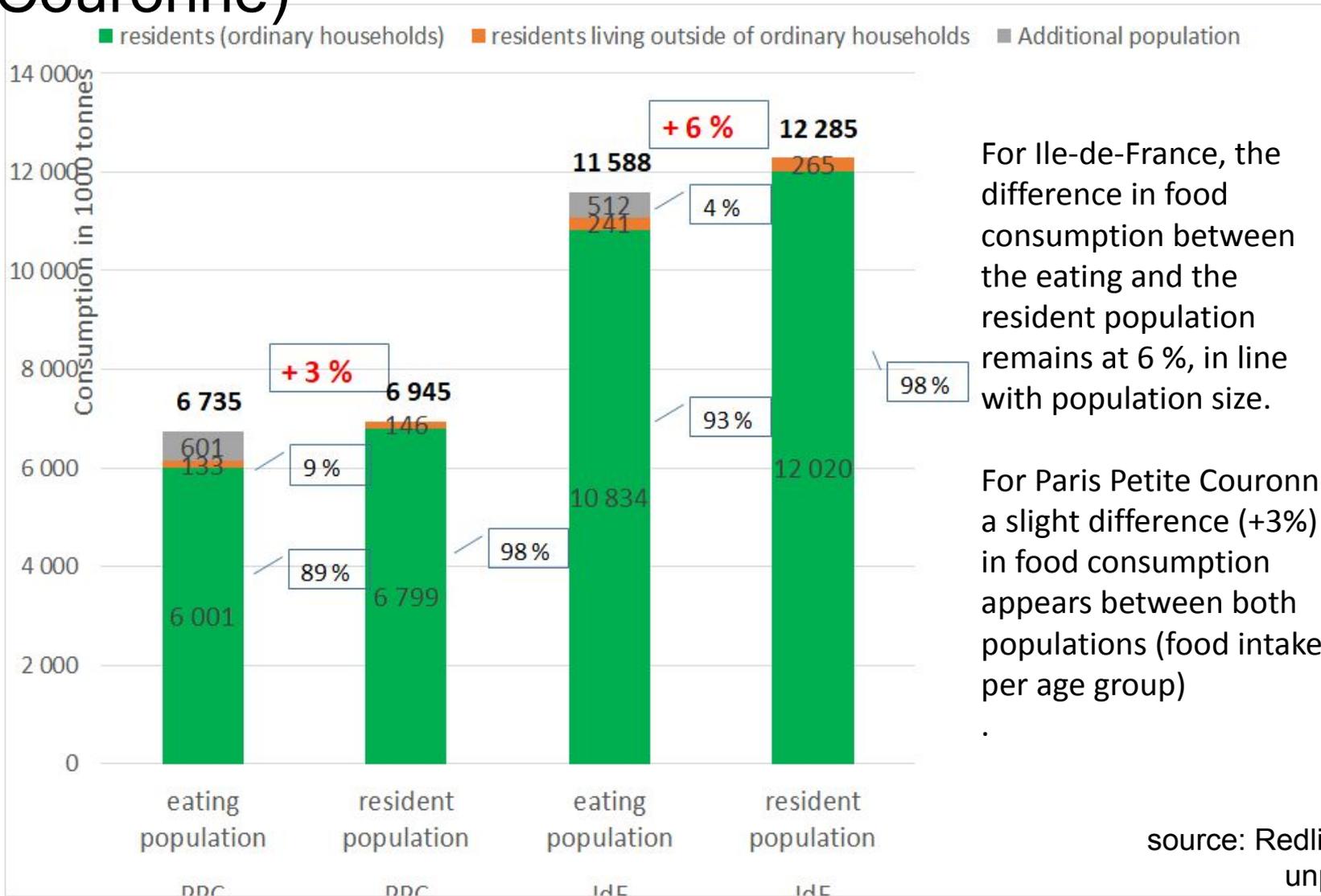
For Ile-de-France, the difference in food consumption between the eating and the resident population remains at 6 %, in line with population size.

For Paris Petite Couronne, a slight difference (+3%) in food consumption appears between both populations (food intake per age group)

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source: Redlingshöfer, unpublished

The eating population is smaller than the resident population except for the periurban Western Paris example
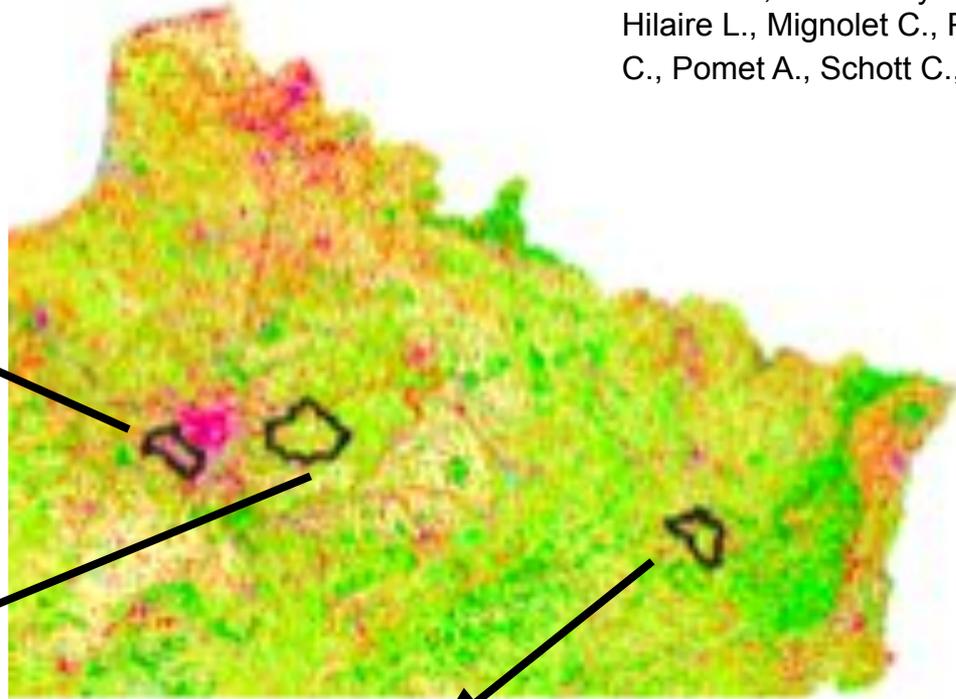
Barataud F., Billen G., Garnier J., De La Haye Saint Hilaire L., Mignolet C., Petit C., Pomet A., Schott C.,

Periurban Western Paris : a community of periurban cities close to the Paris Metropolitan area where agriculture is resisting but changing

57 municipalities – 431 km^2 – 1961 inh/km^2

802K peeqs

La Brie laitière : an area of the wider Parisian basin with specialized agriculture of crops for exports

*83 municipalities – 967 km^2 – 118 inh/km^2*

102K peeqs

West of the Vosges : a rural area with a multipolar grid of cities where livestock - crop systems are persisting but are disconnected from the local resources and markets

251 municipalities – 2319 km^2 – 31 inh/km^2

58K peeqs

Towards a web-based tool for easy quantification of the eating population (POPCORN project): connecting the data bases...
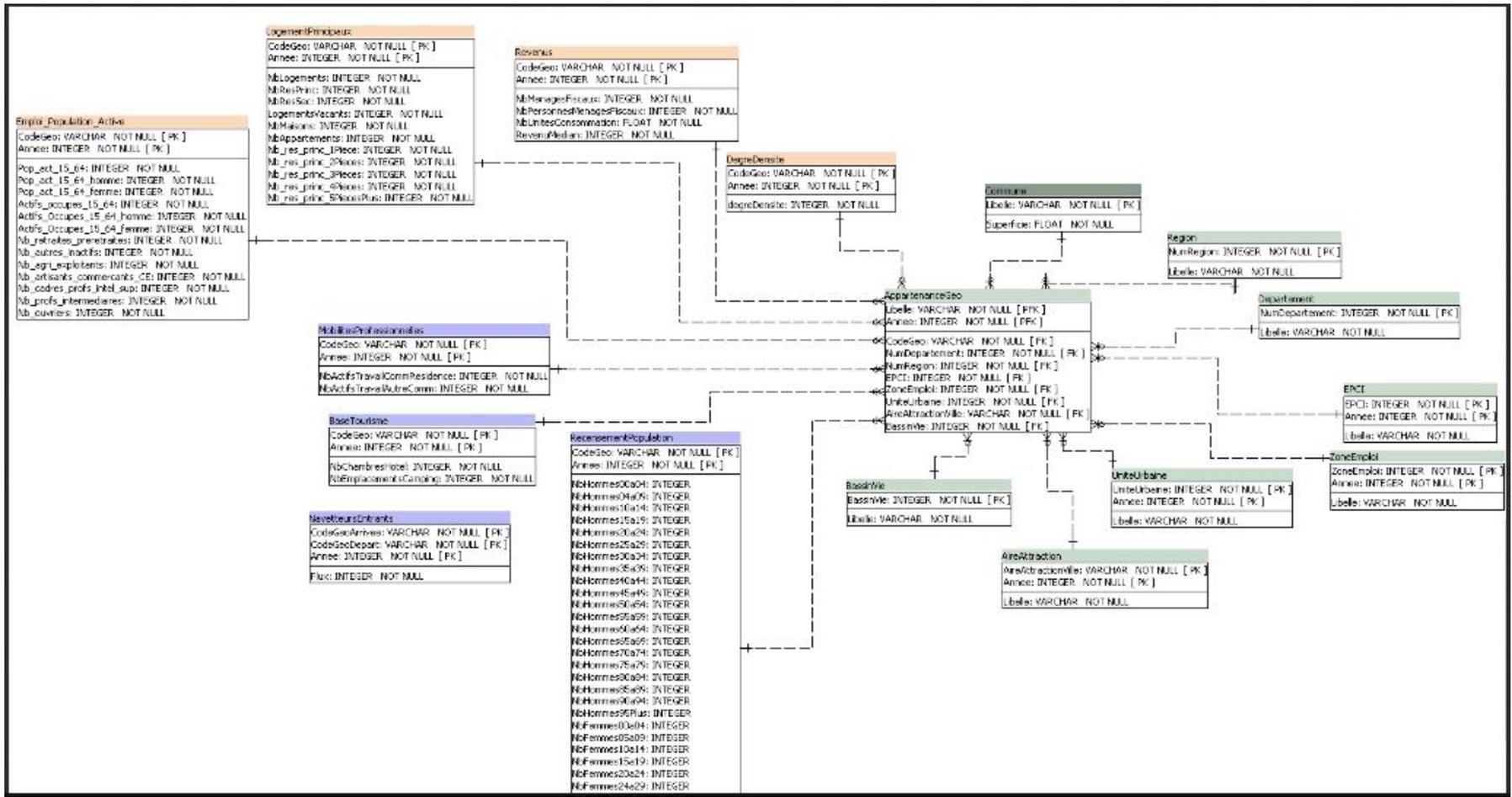
...and programming a search tool with a user-friendly interface

with Jérôme Deschamps, Géraldine André and François Pinet

Discussion and outlook

- Further characterize the resident population in terms of e.g. income (proxy for time spent away?), other key determinants for food consumption missing ?

- Test the concept and tool in more diverse urban or periurban areas according to different characteristics (embeddedness in metropolitan areas, isolated cities, tourist places etc.)

- Usefulness of the approach of population equivalents, such as the permanent eating equivalent, for non-food sectors (e.g. energy consumption) as it covers mobility, time spent in and away from the urban system ?

- What are features of cities that influence the eating population, e.g. socio-economic status of the population, embeddedness in commutersheds etc.?

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> **Thank you for your interest !**

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