



HAL
open science

Populations exposure to foodborne pollution in OHM(i) – literature review of these socio-ecosystems.

Nathalie El Deghel, Anne-Laure Badin, Michael Rapinski, Priscilla Duboz,
Jean-Philippe Bedell

► **To cite this version:**

Nathalie El Deghel, Anne-Laure Badin, Michael Rapinski, Priscilla Duboz, Jean-Philippe Bedell. Populations exposure to foodborne pollution in OHM(i) – literature review of these socio-ecosystems.. International Symposium of LabEx DRIIHM 2023, Jun 2023, Strasbourg, France. , 2023, <10.34972/driihm-770353>. <hal-04171157>

HAL Id: hal-04171157

<https://hal.science/hal-04171157v1>

Submitted on 26 Jul 2023

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.



HAL Authorization

Populations Exposure to Foodborne Pollution in OHM(i)

–Literature Review

Nathalie El Deghel¹, Anne-Laure Badin¹, Michael Rapinski², Priscilla Duboz³, Jean-Philippe Bedell¹

¹ Univ Lyon, ENTPE, Université Claude Bernard Lyon 1, CNRS, UMR 5023 LEHNA, 69518 Vaulx-en-Velin, France.

² UMR 7206 Eco-Anthropologie (CNRS, MNHN, Université Paris-Cité), 75116 Paris, France.

³ IRL 3189, Environnement, Santé, Sociétés, Dakar BP15241, Sénégal.



Introduction

Food plays a fundamental role in maintaining human health. It also makes it possible to reveal an identity character, specific to each socio-ecosystem studied in the Human-Environment Observatories (OHM), especially if it comes from agricultural, hunting, fishing, or traditional livestock activities. Food can also carry contamination and contribute to the exposure of populations to pollutants. At the territorial level,

this can create dilemmas for decision-makers between food security and emerging health risks. In the different observatories, food practices and sources of contamination are varied. The question is: **“Do the dietary practices of certain territories generate situations of exposure to pollutants through food that are stronger than in other territories?”**

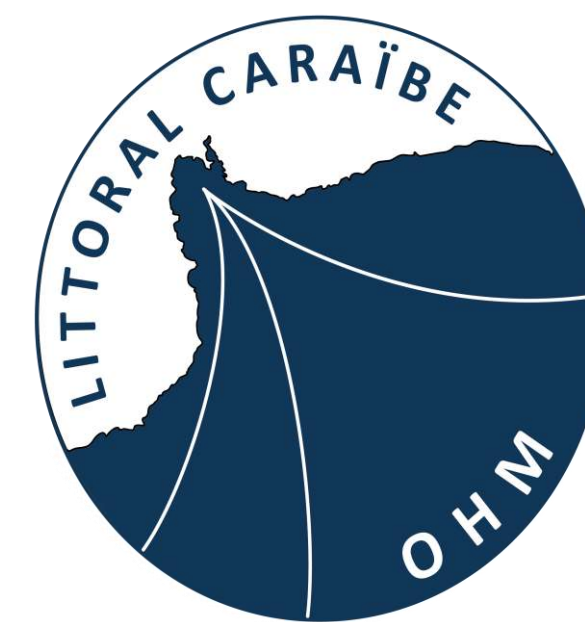
Method

1. Literature Review focusing on:

- State and type of contaminants (food and environment) in 5 OHM(i)
- Dispersion of the pollution
- Health Risk Assessment

2. Analysis and classification of the existing data

- Sources of pollution
- Environment compartments and food matrix
- Used biomarkers
- Studied populations



Results

For the OHMi Estarreja

- Chemical discharges of the Industrial Chemical Complex into the environment (soil, water, etc.)
- Transfer to the food chain level
- Assessment of the health risk

For the other OHM(i)

- The analyzes carried out targeted either a few contaminants or a few matrices (missing data for a good characterization of the risk)

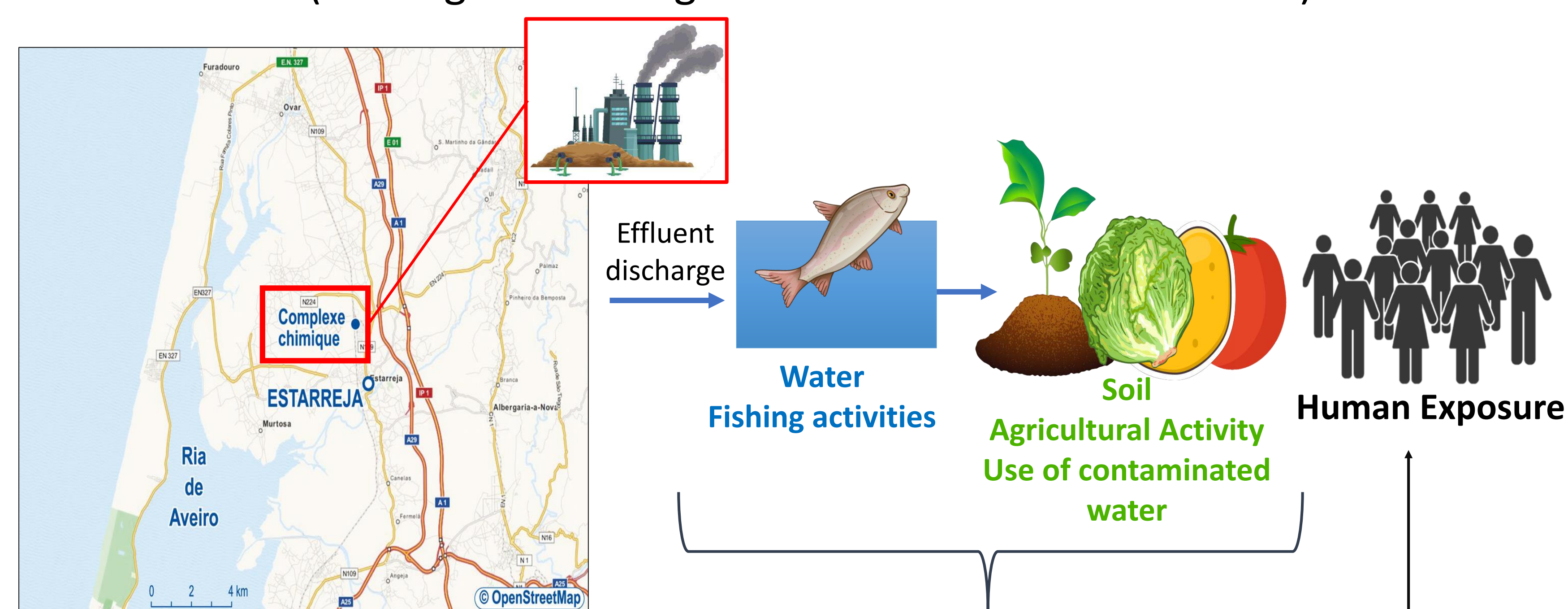


Figure 1. The schematic diagram of the phenomenon of dispersion of pollutants in the environment, foodstuffs from the source of contamination to human exposure in the OHM(i) Estarreja.

Table 1. Summary of existing knowledge of each OHM(i)*.

OHM(i)	Disturbing Event (Date)	Type of contaminant	Matrix	Biomarkers/ Studied population
Estarreja	Adoption of virtuous practices within the CQE (1990)	Wide variety of Metallic Element Traces	Soil, Water, Vegetables, Plants, Fish	Hair, Urine, Fingernails, Blood Children, Adults
Nunavik	Plan Nord, i.e., Plan North (2011)	Focused on Lead (Pb), Methylmercury (MeHg), Cadmium (Cd), PCBs	Food (Country and Market Foods)	Blood, Hair, Umbilical cord blood Children, Young People, Pregnant and Childbearing-age Women, Prenatal Exposure
Littoral-Caraïbe	Transformation and acceleration of maritime trade (from the 1970s)	Chlordecone	Sediment, soil, Water Few studies were done on food matrix	Blood Children, Pregnant Women Marine fauna
Oyapock	Oyapock River Bridge (2017)	Focused on Lead (Pb) and Mercury (Hg)	Fish, Water, Manioc	Blood, Hair Children, Pregnant Women
Téssekéré	Great Green Wall (2008)	Microbial contamination	Water	-

*For detailed references, scan the QR in the references section

Conclusion and perspectives

Based on this literature review, the phenomenon of the dispersion of contamination in several food matrices and the compartments of the environment was more studied for the OHM(i) Estarreja than for the other OHM(i). Work is in progress to target the matrices to be analyzed, and the sampling areas to be chosen to assess the exposure of the populations to pollution in different OHM(i).

References

- Rapinski, M. *et al.* Local Food Systems under Global Influence: The Case of Food, Health and Environment in Five Socio-Ecosystems. *Sustainability* **15**, 2376 (2023).
- Cabral Pinto, M. M. S. *et al.* Human predisposition to cognitive impairment and its relation with environmental exposure to potentially toxic elements. *Environ Geochem Health* **40**, 1767–1784 (2018).
- Cabral-Pinto, M. M. S. *et al.* Human Health Risk Assessment Due to Agricultural Activities and Crop Consumption in the Surroundings of an Industrial Area. *Expo Health* **12**, 629–640 (2020).
- Inácio, M., Neves, O., Pereira, V. & Ferreira da Silva, E. Levels of selected potential harmful elements (PHEs) in soils and vegetables used in diet of the population living in the surroundings of the Estarreja Chemical Complex (Portugal). *Applied Geochemistry* **44**, 38–44 (2014).

