International symposium
Urban wastelands: a form of urban nature?

Empty lands? Social representations of contaminated brownfields in France

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Session 3B : Soil contaminated brownfields: measures and representations

Tours

21-22 May 2019

Brownfield redevelopment in France

Contaminated brownfields: any land or premises which have previously been used or developed and are not currently fully in use, although it may be partially occupied or utilized and which are soil contaminated.

Two facts/figures:

Land artificialisation: 55 000 Ha (Fontes-Rousseau et al. 2015)

Land impermeabilisation: 250 km² (Sainteny, 2008) each year.

Urban contaminated brownfields estimation: between101 000 and 115 000 Ha (Ademe et QuelleVille?, 2015).

Brownfield redevelopement: a priority = numerous laws Grenelle 1 and 2 (2009) and 2010), ALUR (2014).

Obstacles

Contaminated sites are located in areas cumulating:

- Economic problems (Caudeville *et al.*, 2016, Yaconove, 2011);
- A high concentration of social problems (Accordino *et al.*, 2000 ; Prujit, 2013)
- Health inequalities (Bambra *et al.*, 2015 ; Gilderbloom *et al.*, 2014).

=> « **stigma effect** » (Bond, 2000 ; Chan, 2001 ; Mundy, 1992 ; Patchin 1991).

It corresponds to negative perceptions and representations that individuals develop regarding the brownfield site (Kunrehther & Slovic, 1999)

Stigma effect and its impacts

Stigma effect occurs when the entire neighbourhoods of the site are avoided and lie unused and unproductive for long decades because of suspected contamination and socioeconomic problems (Patchin, 1991).

Even worse, this effect may persist even after remediation process (Broto et al., 2010; Kim & Miller, 2017; McGee, 1999; Wadu Mesthrige, Wong, & Yuk, 2018).

Reappropriation of the former brownfield?

Literature review: stigma

Stigma's impacts have been widely studied in the literature regarding its adverse impacts on property value (Eisen, 2015; Guntermann, 1995; Kiel & Williams, 2007; Messer, Schulze, Hackett, Cameron, & McClelland, 2006; Roddewig, 1999; Taylor et al., 2016).

Yet, the stigma effect has been barely investigated from the point of view of citizens living near a contaminated brownfield site.

Motivations

Objective:

1. Analyze the relative importance of the stigma effect according to individuals living near a contaminated brownfield
2. Find out how it influences individuals' behaviors regarding brownfield redevelopment.

Problematic

What are the social representations of contaminated brownfields?

1. Soil contamination's representations?

2. Urban brownfields's representations?

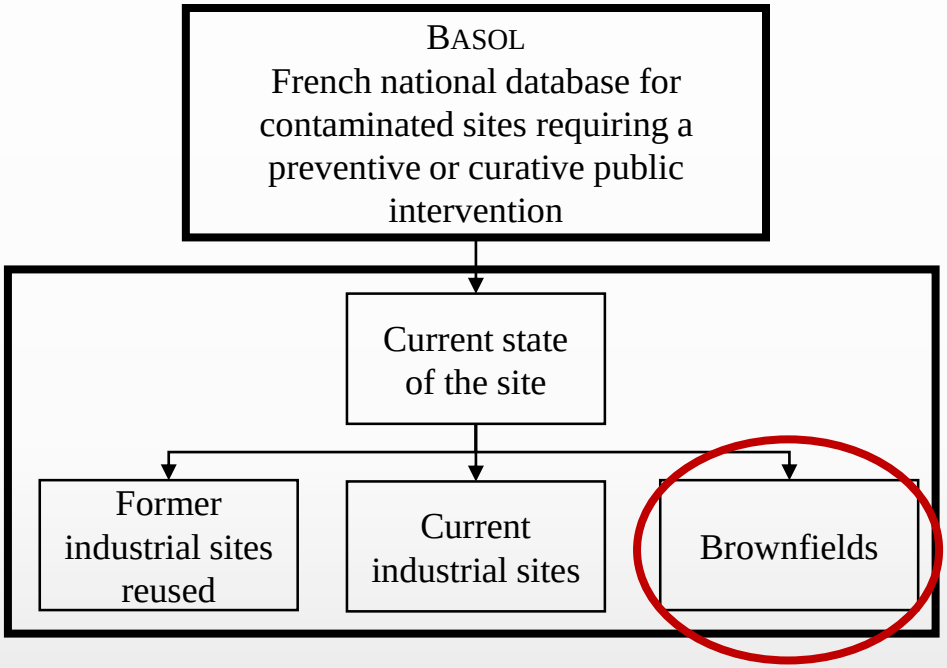
Materials and methods

1. Identify soil contaminated brownfields in France;

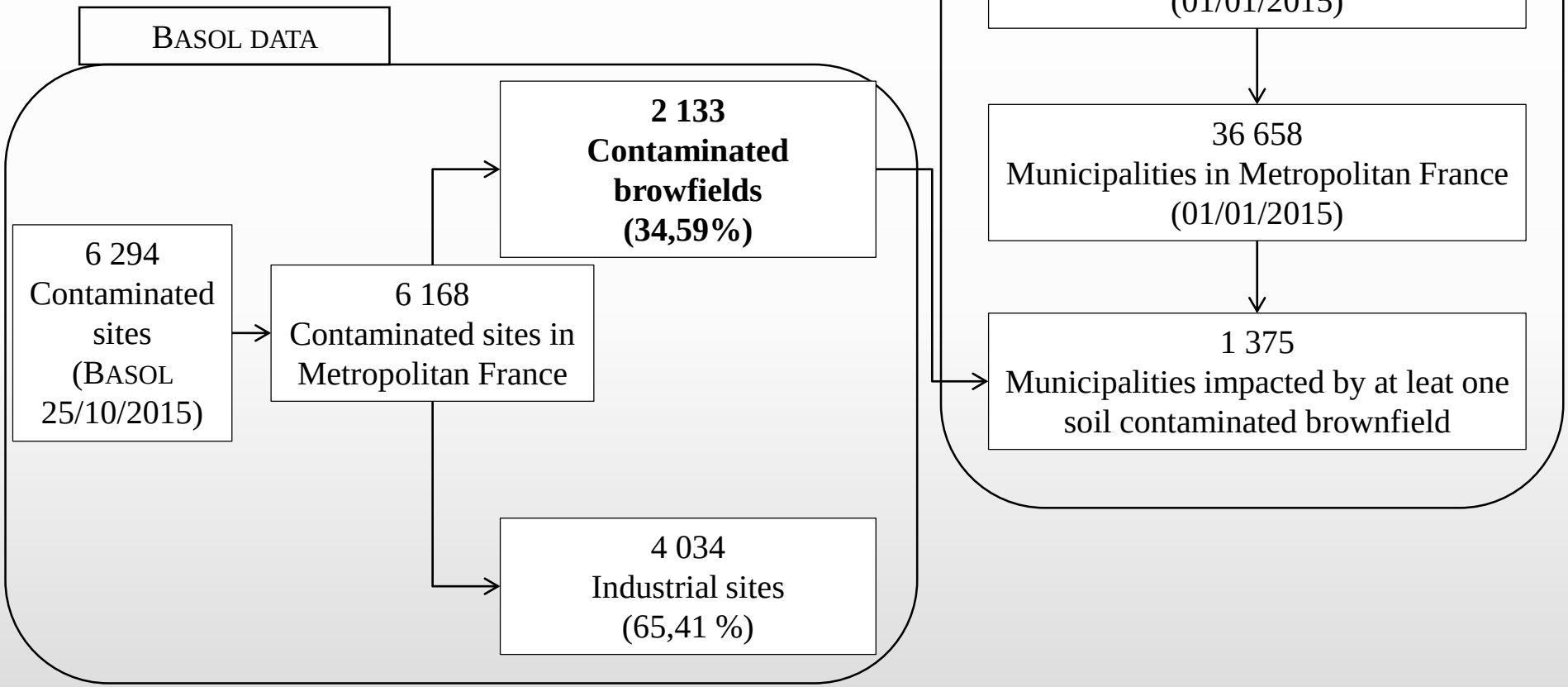
2. Survey individuals living in a municipality impacted by a contaminated brownfield;

3. Analyse social representations associated with the contaminated brownfield.

Contaminated brownfields' identification



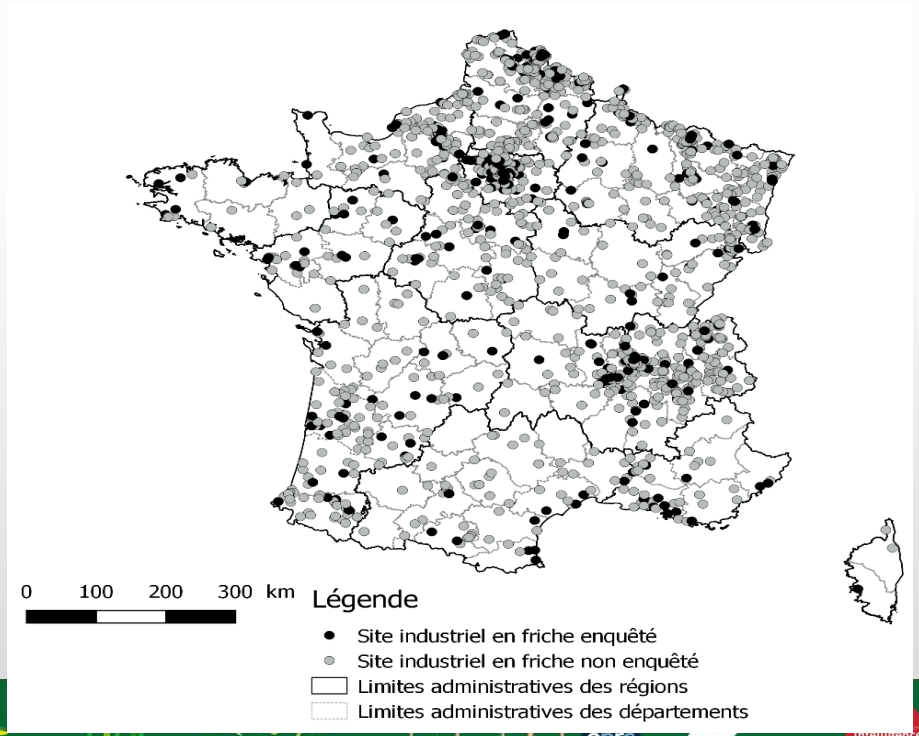
Contaminated brownfields' identification using BASOL and INSEE data



Municipalities impacted by brownfieds

1375 municipalities impacted

These responses are located in 503 different municipalities impacted by at least one contaminated brownfield.



Questionnaire survey design

The aim of this questionnaire was fourfold:

1. Analyze representations, perceptions, and knowledge regarding soil contamination
2. Analyze representations, perceptions, and knowledge regarding brownfield sites
3. Identify preferences and expectations regarding brownfield redevelopment project in France
4. Examine the level of trust given to different actors that may release information regarding soil contamination (iv).

Data were collected by a survey questionnaire administered online using Limesurvey.

Socio-demographic statistics

Representative sample of French population;

Quota on age and gender;

N = 803

% of individuals surveyed

Depending on brownfields densities

Variables	Eff.	%
Genre		
Homme	383	47.70
Femme	420	52.30
Age moyen (écart-type)	44.12 (12.93)	
Age en classes		
Entre 19 et 24 ans	49	6.10
Entre 25 et 39 ans	256	31.88
Entre 40 et 59 ans	378	47.07
Entre 60 et 74 ans	120	14.94
Niveau d'éducation		
Sans diplôme ou brevet des collèges	39	4.86
CAP ou BEP	158	19.68
Baccalauréat	190	23.66
Bac + 2 (DUT, BTS, DEUG, etc.)	201	25.03
Bac + 3 ou plus	215	26.77
Statut d'activité		
Actifs	558	69.49
Inactifs	245	30.51
Catégories socioprofessionnelles (CSP)		
Agriculteurs exploitants	3	0.37
Artisans, commerçants, ou chef d'entreprise	19	2.37
Cadres, et professions intellectuelles supérieures	101	12.58
Professions intermédiaires	132	16.44
Employés	249	31.01
Ouvriers	54	6.72
Inactifs	245	30.51
- *dont retraités*	93	11.58
- *dont étudiants*	30	3.74
- *dont demandeurs d'emplois*	46	5.73
- *autre inactifs (invalides, hommes/femmes au foyer, etc.)*	76	9.46

Social representation: definitions

A representation is the “product of processes of mental activity through which an individual or group reconstitutes the reality with which it is confronted and to which it attributes a specific meaning” (Abric, 1994, p. 13).

By extension, social representations correspond to collectively shared ideas, thoughts, image and knowledge about a subject or a phenomenon of social interest subprime mortgage crisis(Moscovici, 2003).

Social representation theory

- Derived from both social psychology and sociology (Kouira, 2014).
- It provides a theoretical framework to investigate changes and phenomena at a collective level (Wagner et al., 1999) by analyzing anchoring and objectification.

Anchoring is the process by which new ideas, knowledge or opinions are integrated into existing worldviews whereas objectification is the process by which abstract ideas become concrete (Abric, 1996).

- Social representations analyses the system of meaning and interpretation that individuals express at a given time in relations to its environmental and cultural context (Mannoni, 2016; Rateau & Lo Monaco, 2013)

Analysing social representations

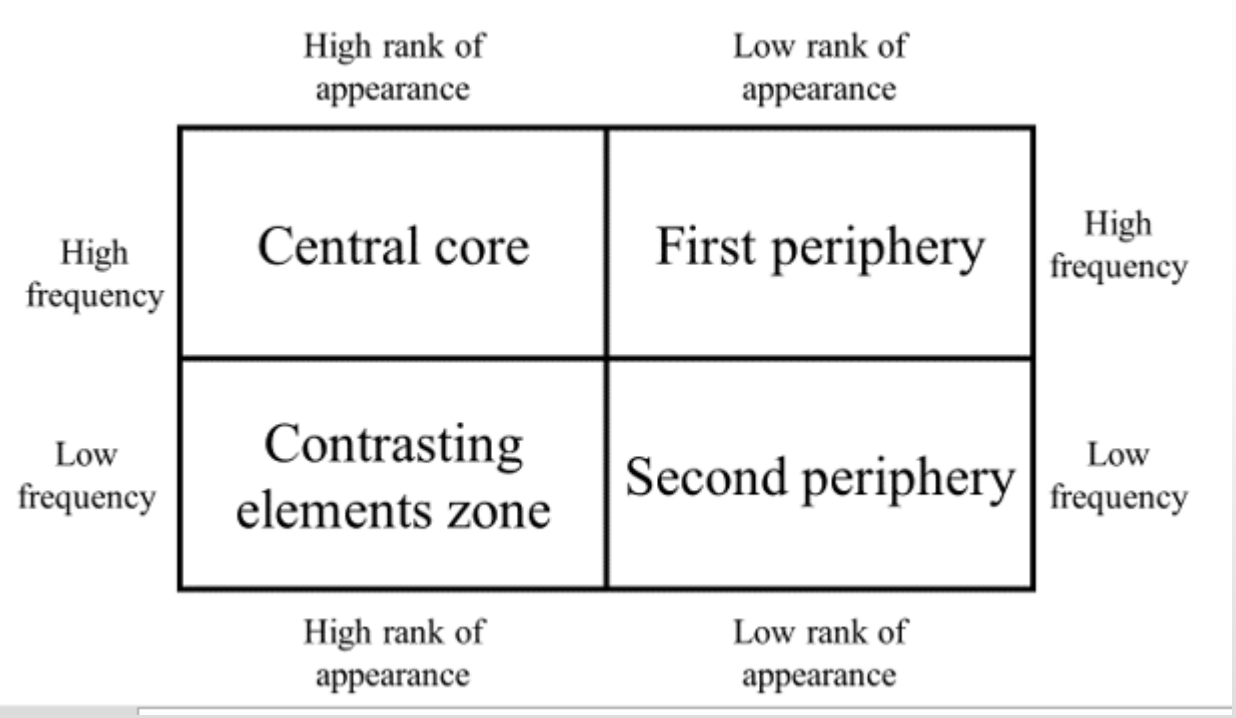
- We use two open-ended questions:
  - What first comes into your mind when you think about soil contamination?
  - What first comes into your mind when you think about brownfields?

Spontaneous answers (Lebart et Salem, 1994).

A structural approach (Abric, 2001; Abric & Tafani, 1995; Flament, 2003).

Analysing social representations

- We use a structural approach



Textual analyses

- Provide statistical indicators and visual charts to analyse the complex information contained in texts (Lebart & Salem, 1994).
- Support the interpretation of the phenomenon on quantitative and objective criteria (Garnier & Guérin-Pace, 2010).
- It avoids biases resulting from the thematic post-codification stage. Indeed, thematic post-codification excludes unusual responses even if they are an important detail to understand the phenomenon.
- Textual analyses are well-suited to analyse and understand social representations (Abric, 2003; Beaudouin & Lahlou, 1993; Kalampalikis, 2005; Negura, 2006)

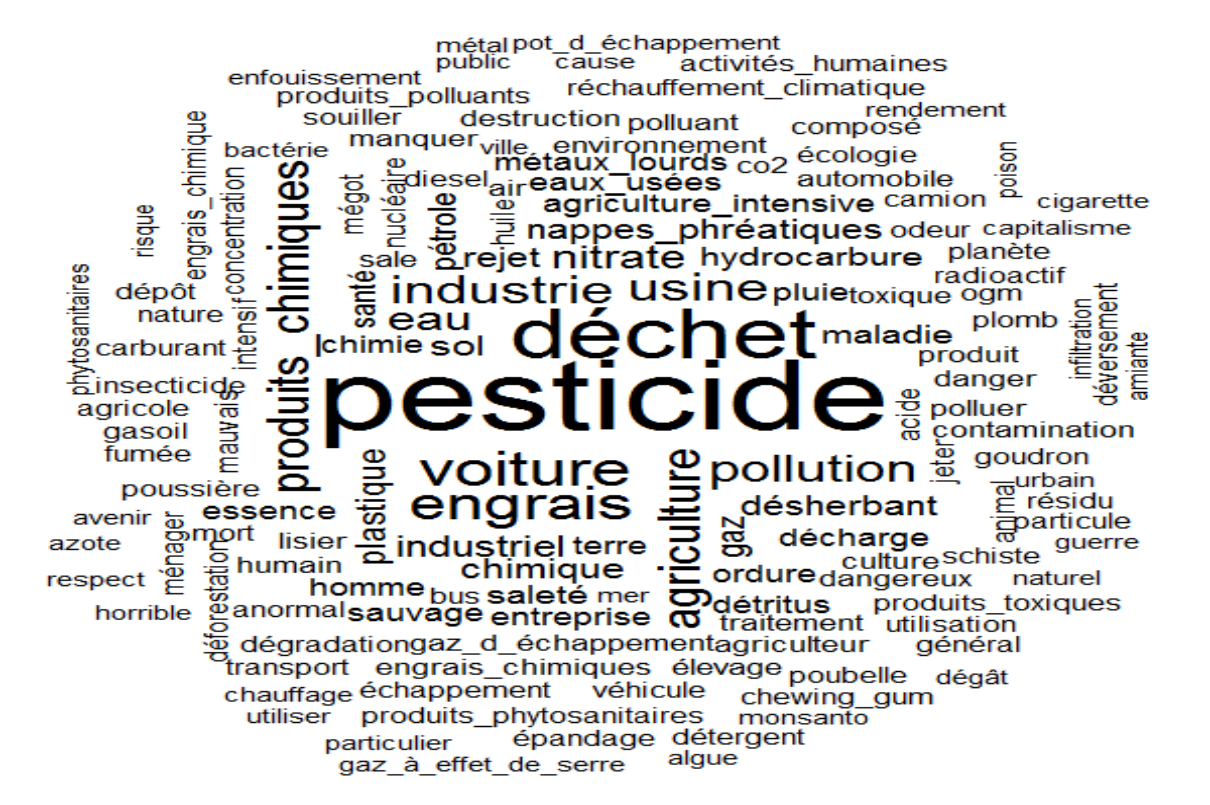
IRaMuTeQ

Descriptive statistics of the two corpuses

	Corpus 1 Pollution du sol	Corpus 2 Friches urbaines
Nombre de réponses	723	539
Nombre de mots (occurrences)	2 687	2 177
Nombre moyen de mots utilisés	3,72	4,04
Nombre de formes actives (total)	2 123	1 537
Nombre de formes supplémentaires (total)	564	640
Nombre d'hapax	295	275
Nombre de formes	564	482
Nombre de formes actives (différentes)	498	402
Nombre de formes supplémentaires (différentes)	66	80

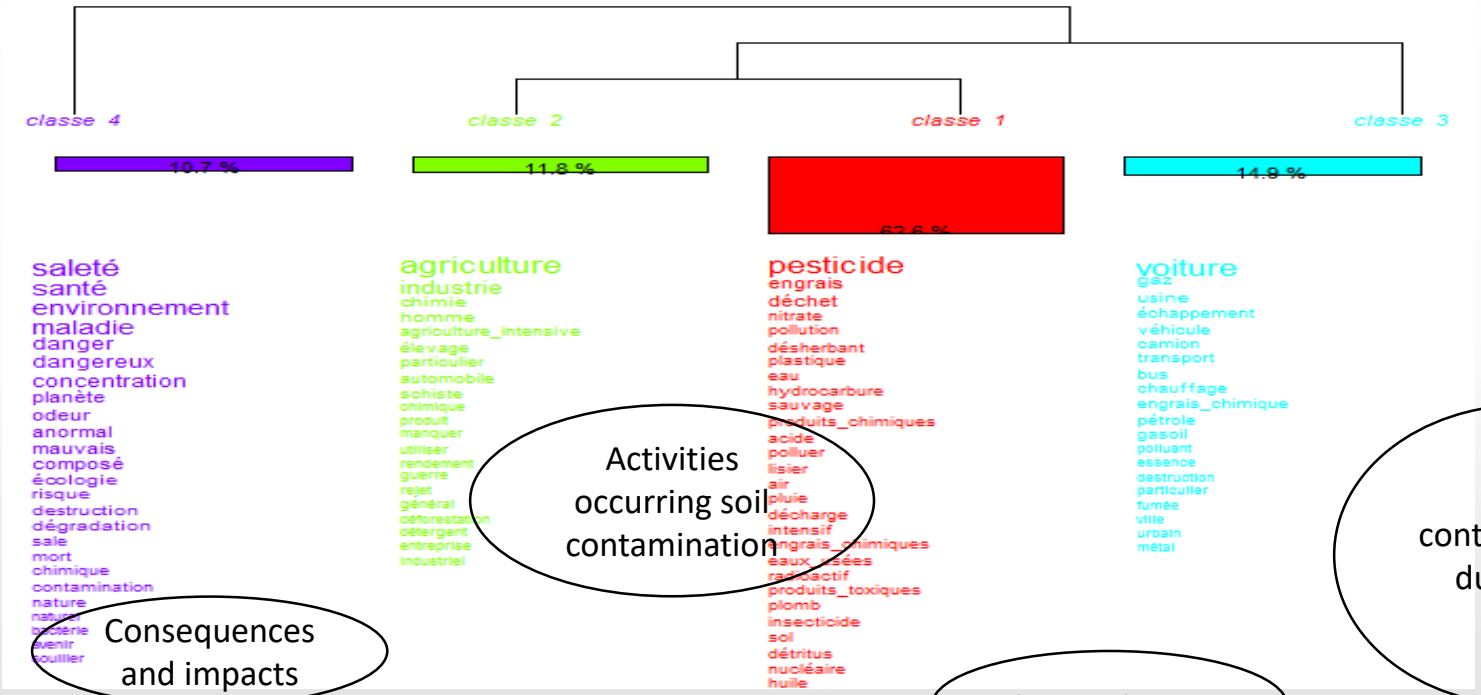
Tableau 2.8 – Description des deux corpus de textes analysés

Social representation of soil contamination



N = 723

Social representation of soil contamination



Consequences and impacts

Activities occurring soil contamination

Contaminants

Soil contamination due to air traffic

N = 723

Social representation of soil contamination

What first comes into mind when individuals think about soil contamination

Fréquences	Rang d'apparition	
	Faible ⩽ 2.03)	Élevé (> 2.03)
Élevé (⩾ 8.37)	Pesticide Voiture Usine Engrais Produits chimiques Nitrate Fumées Désherbant Industrie Saleté Métaux lourds Agriculture Eaux usées Déchets Maladie	Agricole Industriel Agriculture intensive Chimique Eaux Plastique Hydrocarbures Humain Pétrole Déchet Essence Mégots de cigarette Gaz Exploitations agricoles Lisiers
Faible (< 8.37)	Produits phytosanitaires Diesel Engrais Chimique Terre Destruction Détergent Danger Détritus Pollution des eaux Déchet toxique Chewing-gum Poussière Déchet	Manufacture Pluies acides Déchets industriels Environnent Santé Déchets ménagers Eaux contaminées Réchauffement Ordure Gasoil Dioxyde de carbone Goudron Huile

Tableau 2.11 – Résultats de l'analyse prototypique associée au corpus sur la pollution du sol (N = 723)
Les chiffres entre parenthèses correspondent respectivement au rang moyen d'apparition et à la fréquence moyenne du terme dans le corpus.

N = 723

Social representation of soil contamination: main results

- Individuals misunderstood what's soil contamination
  - Waste disposals and in particular domestic wastes
  - Air pollution and traffic

  They refer to perceptible elements: fumes, odors

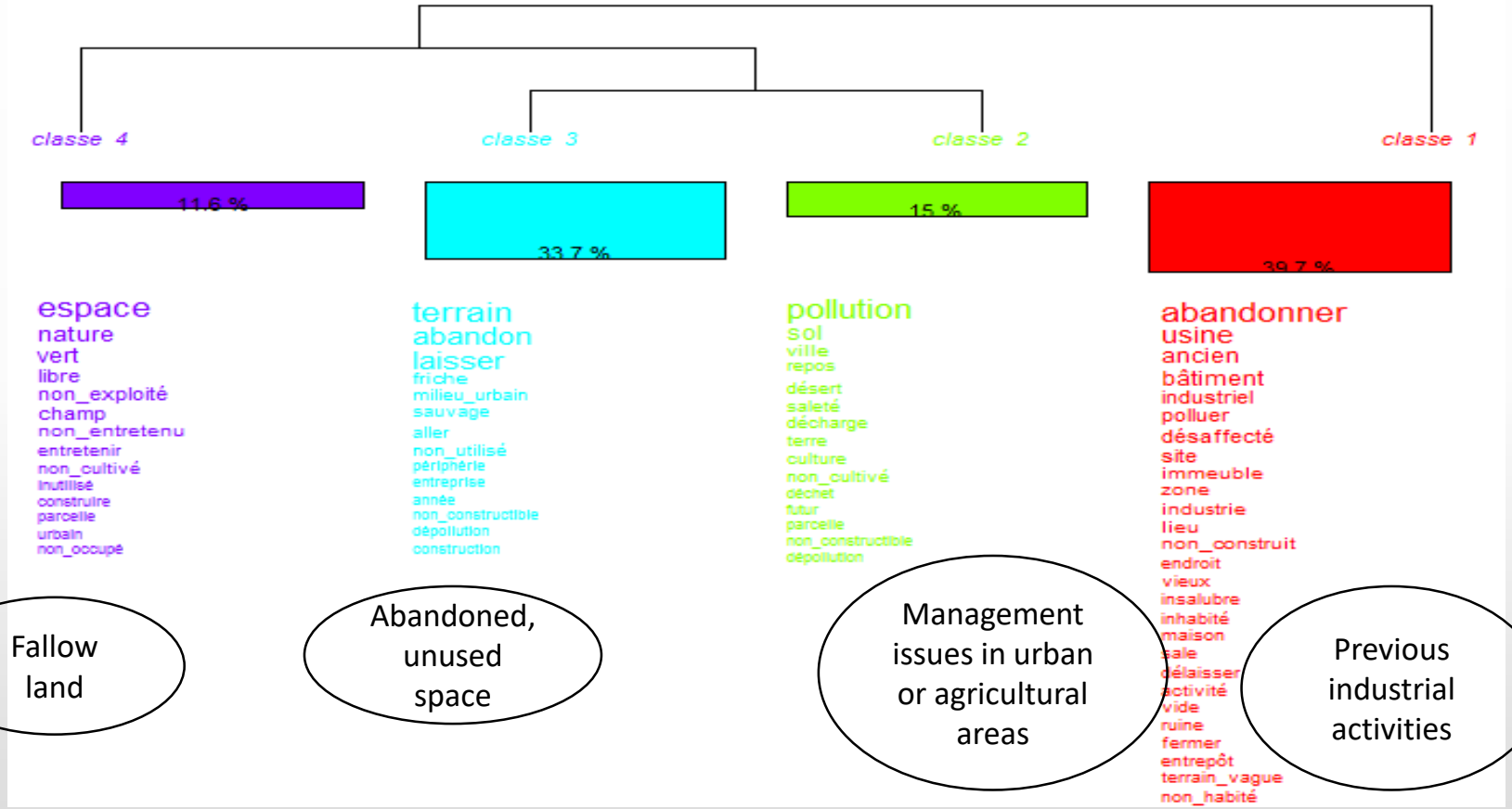
  They evoke mainly agricultural contamination: chemical products and fertilizers uses.

  Fertilizers only 0.55 % of contaminated sites listed in BASOL.

  Regional disparities: in Britanny and Pays de la Loire = pig manure

Representations of brownfields

Representations of brownfields: classification



Fallow land

Abandoned, unused space

Management issues in urban or agricultural areas

Previous industrial activities

Representations of brownfields: prototypical analysis

This technique assumes that the central core elements are more salient than the others (Vergès, Tyszka, & Vergès, 1994). This saliency is usually estimated through two main criteria: words frequency and rank of appearance, that is to say the first words that individuals give when they think about the phenomenon analyzed.

Fréquences	Rang d'apparition	
	Faible ($\leqslant 1.64$)	Élevé (> 1.64)
Élevées ($\geqslant 5.15$)	Zone abandonnée Terrain vague Jachère Abandon Fermeture Déchet Ville Herbes folles	Pollution Usine Déchet Non-entretenu Décharge Ruine Ordure
Faible (< 5.15)	Jardin Espace-libre Des-industrialisation Friche Démolition Zone non-construite Désert Détritus Déforestation	Sale Non-cultivé Nature Environnent Sol Danger Maison Squat Végétation

Tableau 2.15 – Résultats de l'analyse prototypique du corpus sur les friches urbaines (N = 539)

Les chiffres entre parenthèses correspondent respectivement au rang moyen d'apparition et à la fréquence moyenne du terme dans le corpus.

Social representation of brownfields

- Individuals think about soil contamination and waste disposal issues
- They make the link with uncontrolled vegetation growth
- They refer to the etymological sense: fallow lands
- A minority quote social issues such as squatting
- Regional disparities: industrial terms in Hauts de France region.

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Discussion and limitations

- To identify brownfield sites, we relied on data extracted from BASOL. Generalization of our results as we focus only on contaminated brownfields and thus exclude other situations (i.e. non-contaminated brownfields)?

- Order effect of questions?

Discussion and limitations

- We analyze social representations associated to homogeneous sites on individuals who are living in a municipality concerned by contaminated brownfield issues.
- Regarding soil contamination: similarities with (Angignard, 2006; Angignard & Ferrieux, 2007): a preliminary study regarding perceptions of soil contamination among 141 French individuals living in the Occitanie region

Conclusion

- We identifiy social representations regarding contaminated brownfields
- Results suggest individuals misunderstood soil contamination – confusion with air pollution -> public communication to be improved.
- Individuals perceived site contamination but don't know when it is going to be remediated -> -> public communication to be improved.
- Brownfields linked with fallow land and unmaintened green spaces

This is similar to other studies regarding non-contaminated vacant lands (Brun, Vaseux, Martouzet, & Di Pietro, 2017; Rouay-Hendrickx, 1991; Wintz & Dersé, 2012).

- Individuals don't perceived potential benefits (e.g. biodiversity)