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# The Environment as a Factor of Spatial Injustice: A New Challenge for the Sustainable Development of European Regions?

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## 1. Introduction

The poor are much more subject and vulnerable to environmental degradation, or risks of its occurring; they are also more strongly affected by the negative impact of certain international, national or local policies. This has long been the case, in France and abroad, in the North as well as, of course, in the South (see for instance Schroeder and al., 2008). Similarly, so-called pro-environmental attitudes and practices (relative to food, energy or mobility, for example), which have recently made their appearance, particularly in western European countries, prove to be no less non-egalitarian or inequitable. This issue nowadays represents a major stake for social and spatial justice, at various levels: from the continental and intercontinental (e.g.: ecological debt, environmental refugees...), to the local level (e.g.: socially precarious energy resources), and encompassing the urban scale (e.g.: gentrification and environmental segregation). Yet, the equitable rights of individuals to a healthy and quality environment have been set down in a number of texts, some of them constitutional, both international (Aalborg and Leipzig Charters, in 1998 and 2007, Declaration of Istanbul in 1996) and national (e.g. Environmental Charter in the French Constitution in 2005).

The values (moral, social and/or esthetic references embraced by a given group at a given time) and the principles that found its action (social norms and rules of implementation), embodied in public planning, environmental and even social policies, are direct queries, both as concerns their contribution to these contradictions, and with a view to bring about change for sustainable development. Starting out from sustainable development, we note that for a long time the official discourse relative to these values and principles limited itself to the “prophetic horizons” by formulating the famous ecological, economic and social pillars: livable, viable... and equitable. These are what sustainable development was supposed to guarantee. In fact, it is only as part of eco-neighbourhood (or so called sustainable neighbourhood) projects, and more generally within the framework of so-called sustainable urbanism and planning projects, that these considerations on values and principles are today more clearly highlighted. It is also true that they pose increasingly concrete questions concerning the various forms of socio-environmental segregation, i.e. social and environmental inequalities in certain places, to which these new neighbourhoods may have given rise abroad (BedZed in London, BO01 in Malmoe, Vauban in Freiburg, Germany).

Thus, the theme of environmental inequalities, and the forms of injustice they generate, appear to be anything but neutral for the practical implementation or practice of sustainability. In France for instance, this is illustrated by the updating in 2006 of the National Scheme of Sustainable Development, which places environmental inequalities squarely in the center of the approach. For Europe, we find similar initiatives in Scotland, with the Strategy for Sustainable Development (Section 8, 2005), as well as the earlier official report of the UK Environmental Agency on *Poverty and the Environment* (2003), which subsequently introduced a poverty indicator into environmental accounting (UK Environmental Agency, 2007). In fact, it is in the United States that official recognition of this issue goes back the furthest. Born of the civic rights movement and the fight against discrimination, *Environmental Justice* is based on early proof (General Accounting Office in 1979 and 1983 ; the United Church of Christ, in 1987 ; Bullard in 1983, 1990 and 1994 ; Wenz in 1988) of a non-egalitarian distribution, first ethnic (especially Blacks, Amerindians and Hispanics), then economic, of populations relative to the major forms of infrastructure and equipment that have a major impact on the environment (health risks, mortality rates). On 11 February 1994, the Federal Administration institutionalized *Environmental Justice* pursuant to Executive Order 12898 : *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This Executive Order decreed that all federal agencies including the EPA or Environmental Protection Agency should: “*identify and remedy the effects of measures that disproportionately affect the health and living conditions of the poor or those who belong to ethnic minority groups*”.

More recently, as we will discuss below, developments focus particularly on regions or cities, which increasingly concentrate these environmental inequalities, and challenge social and spatial justice. For instance, as mentioned by the Interministerial Delegation for Cities in France 2006, it is becoming difficult to call for social mixity in neighbourhoods with a strongly degraded environment. It is true that, as confirmed by experiences with eco-neighbourhoods, such inequalities are particularly damaging when considering the city, i.e. lifestyles that are strongly affected by socio-spatial divisions and forms of socio-spatial segregation that are historically constituted but also subject to powerful market mechanisms (e.g.: scarcity of property and building costs / acquiring housing). If one adds a few recent challenges and the ecological considerations they feed into (e.g. ‘shrinking cities’, even ‘urban decline’), it is easy to admit that environmental inequalities theoretically represent major social and spatial stakes for territorial governance and urban regulation.

Hence, if the subject of environmental inequalities or injustices is today an increasingly vital question addressing the sustainable development that underlies a growing number of actions, it continues to be globally ignored or overlooked in the public policies. Admittedly, the subject closely interlinks environmental, social and economic aspects, a combination that is theoretically at the basis of all sustainable thought and action, but often finds it difficult to fully realize them. In fact it requires that we overcome sectorial approaches that have developed historically and that are often implemented rationally from the top down. The first reason being that they address major questions relative to the technical approaches and normative answers developed to date throughout the world to solve these problems, and to reposition them within the universe of socio-environmental responses, particularly in cities.

The aim here is to understand why reflections undertaken on environmental inequalities and injustices could, under certain conditions of action, generate a new perspective of the

sustainable city in European regions, by repositioning the terms of the debate, linking social, spatial and environmental justice. Going out from findings and examples of scientific studies from several European countries (France, Germany, Netherlands, United Kingdom...), this chapter aims to highlight the scientific benefits of adopting a different approach to the environment, linking it to social situations and the construction of territories, in order to:

- Not only provide different scientific findings on the state of environmental disparities, inequalities or even injustices, particularly relative to spatial injustices, singularly in cities;
- But also invent other types of actions and means of intervention for sustainable development at urban or regional scales in Europe.

With this aim in mind, the chapter will be divided into two main parts.

The first will propose a few findings and an oriented synthesis of scientific research, based on 50 studies, both French and international (USA, the United Kingdom, Belgium, the Netherlands...). In 2008, the objective was establish, for the French Center for Scientific Research, an international and trans-disciplinary report on the state of the art on environmental justice (main topics, issues and purposes), in order to better identify scientifically relevant issues in France comparatively to other European countries, as assets or limitations, even as hot spots in public and private decision making supports and processes (Faburel, 2010a).

Two integrated hot spots and topics have been particularly explored. Traditionally, in France, environmental issues are viewed through an institutional lens which emphasizes technology and bureaucratic tools of assessment and action. Thus, the historical and legal spatial approach to justice (e.g.: land use and city planning, housing policies...) uses a technocratic and normative conception of the environment to face up to environmental challenges in innovative ways (such as environmental segregation in large cities). However, recent research projects carried out in several countries as well as in France stress the fact that environmental justice should take a more dynamic approach, for instance accounting for local and historic dimensions. So, considering the logic of decision makers and the cultures in the urban field, it has been proposed to explore new ways of thinking that would improve the inclusion of environmental inequalities from the perspective of sustainable development. One way would be to focus on lifestyles and people's experiences linked to the environment, and their attachment to a particular place. Another way would be to adopt a participatory rather than a structural approach to the investigation of exclusion and capacity forms of involvement (i.e. *capabilities*, in Sen, 1993 and 2009) instead of more conventional behavioural markers of urban inequality (such as moving house, for example).

The second part of the study proposes an empirical approach which applies these orientations towards environmental perceptions, representations and local experiences, such as:

- Pertinent issues that provide an interesting scale for the observation or the highlighting of certain other factors that determine urban inequalities in cities;
- Thus orienting both the evaluation (generally based on static and descriptive nomenclatures) and territorial decision making directed by sustainability.

It was conducted for the French Ministry of Ecology, Sustainable Development, Transport and Housing in close cooperation with the Ile-de-France (Paris) region (Faburel et Gueymard, 2008). On the one hand the study confronted so-called objective environmental data (geophysical indicators usually employed to characterize resources and harms: degrees of pollution, noise levels, density of green areas...) with classical socio-economic information (indicators on income, employment, housing...) in 1300 municipalities in the Paris region in order to pinpoint the major types of disparities in the environmental quality of the living environment. Thus, after identifying, on this basis, 6 municipalities close to Paris considered representative of different disparity situations, we conducted a survey in order to confront their responses with the data generated in the first part.

These various linkages notably made apparent a list of environmental objects and factors that make a place attractive or undesirable. Our study also highlighted certain difficulties relative to environmental evaluation and monitoring in urban, suburban and even rural territories. Information on the living and felt environment, through local experiences, satisfaction, place attachment relative to the environment, generated additional elements for a finer assessment of local disparities, inequalities or even injustices (neighbourhood, municipality, inter-municipality), in a sustainable development perspective. The conclusion addresses the issue of the role of the living environment and social involvement in decision making processes, balancing between institutional and bottom up approaches to sustainability for European regions.

## **2. On several major findings and conceptual stakes for sustainable development: Towards new links between justice and the environment in public policies?**

### **2.1 On observing environmental inequalities at different scales**

Abroad, this approach linking living conditions and environmental quality is not new, if one considers the *Environmental Justice* movement in North America which goes back to the 1970s (*supra*); even in France, where it was more modest and used different reference terms, it goes back to the 1980s. At the end of the 1980s, for example, in France a suburban social housing development was four times more likely to have an expressway running through it; in 1986, low income populations were proportionally four times more exposed to annoying noise levels (French National Institute for Research on Transport and Security, 1988). However, ecological crises and environmental ordeals have generated new stakes in this field, at different scales:

- from the international scale, with for example between 50 to 163 million climate refugees, fleeing desertification, deforestation, soil erosion, and disasters (partly also caused by large scale development projects: mines, dams, periurbanisation, biofuels, etc.); in wider terms, owing to the poverty gap between regions (e.g. access to drinking water, food shortages),
- to the more local scale of energy precarity and insalubrious housing of low income populations in certain urban neighbourhoods (plus, in our regions, emerging problems relative to environmental health),
- but also including environmental segregation in cities, with such issues as pollution, nuisances and urban risks which increasingly discriminate between social groups,

regardless of sometimes laudable policies: green taxation and energy measures, steps to protect the landscapes of historical city center neighbourhoods, projects of so-called sustainable/eco neighbourhoods (*supra*)...



Photo 1. Public responsibility: large scale housing developments in France (Ile-de-France region in 1950s)

A great number of data were generated only recently. The attention of the international community focuses on climate change and natural hazards. The 2007 report of the Intergovernmental Panel on Climate Change (IPCC) shows for example that in 2004 the poorest countries represented 37% of the world's population, but only 7% of CO2 emissions, whereas the richest countries showed an inverse proportion of 15% to 45%. Similarly, as shown in the the table below, natural disasters imply different levels of damage.

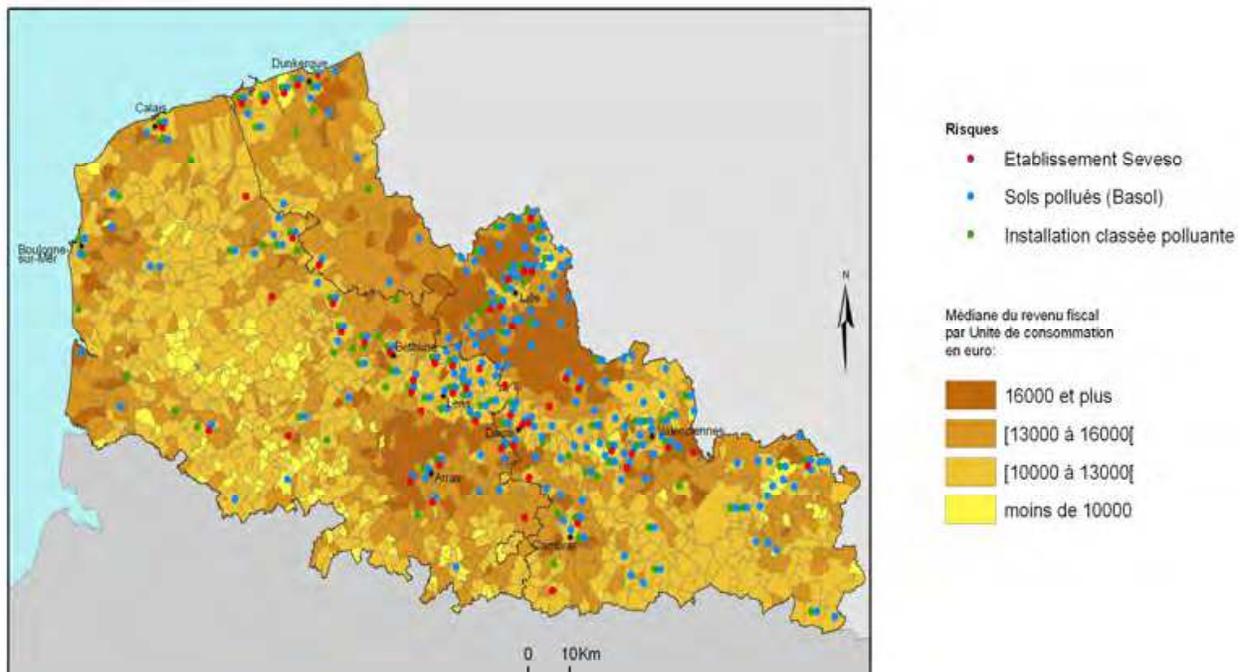
Catégorie de revenu	Nombres de désastres	Population (millions)	PIB par habitant	Nombres de morts	Coût total, en % du PIB
Haut revenu	1 476	828	23 021	75 425	0,007
Bas revenu	1 533	869	1 345	907 810	0,55

Source : Stromberg, David, 2007, « Natural Disasters, Economic Development, and Humanitarian Aid, » *Journal of Economic Perspectives*, Vol. 21 (Summer), pp. 199–22.

Column titles: Income category, Number of disasters, Population (millions), GDP per inhabitant, Number of dead, Total cost in % GDP. Line titles: High income, Low income)

Table 1 Rich countries and poor countries in the face of natural disasters

At the national scale, industrial risks (chemical and other), polluted sites and soils have been the object of several recent studies. It has for example been shown that metropolitan France has a very unequal distribution of high risk sites (safe industrial waste dumps, waste incineration facilities, Seveso sites). 8 % of municipalities harbour two sites, 2.5 % three or more. The southeastern and northern Paris regions (along the old industrial valley of the Seine), the poorer regions around Marseille as well as the large "industrial" agglomerations of the North - Pas de Calais harbour (Laurian, 2009).



Source : IGN BD-CARTO, 2000  
 - INSEE, revenus\_fiscaux\_ménages\_par\_commune\_2002\_nord\_pas\_de\_calais, 2002  
 - DPPR, seveso, 2003  
 - DPPR, installations classées polluantes  
 - MEDD, basol, nov 2004  
 N.B. : Document de travail

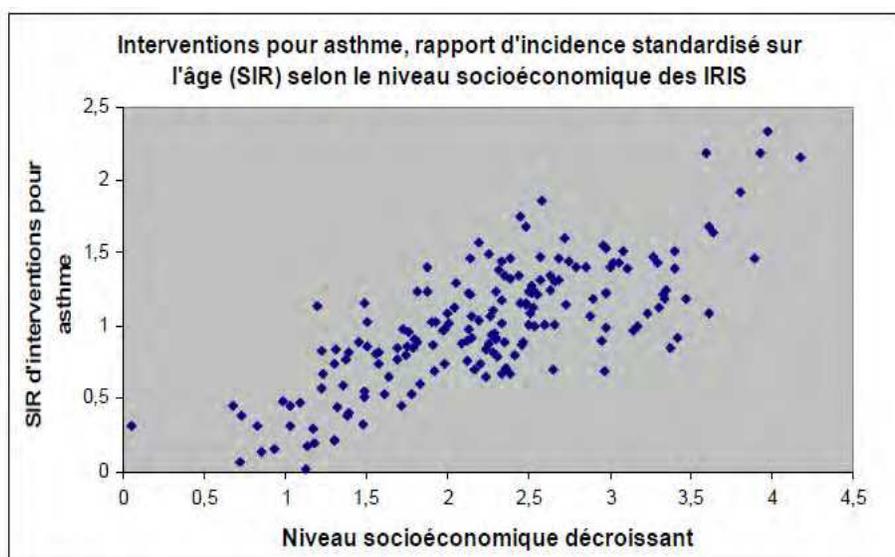
Legend: Seveso site (red), Polluted soil (blue), Site classified as polluted (green). Income category (brown)

Map 1. Inequalities relative to risks and polluted soils (Nord Pas-de-Calais region in 2000s)

Similarly, energy practices have begun to be analyzed from a social profile angle. In this register, the French Environment and Energy Management Agency (ADEME), for example, calculated that in France the part of energy expenditure of the 20% poorest households is 2.5 times higher than that of the 20% richest households.

Finally, on the urban scale, which up till now has certainly been the least studied, a differentiated offer of natural sites, unequal exposure to nuisances and the disparate quality of the living environment are attracting increased attention. Notably in the Ile-de-France region (Faburel, Gueymard, 2008), it has been shown that 2 750 000 persons were in a situation of environmental inequality, industrial decline and economic change, mainly concentrated in the northeastern departments of the “first ring” (e.g. Seine-Saint-Denis), with a historically low income population, or in more remote areas characterized by recent urbanization owing to poorer populations no longer being able to afford housing in the center of the agglomeration, accompanied by strong environmental impact (e.g. east of the Seine et Marne). We shall come back to this issue in the 3rd part.

And, at this more urban scale, environmental health is increasingly studied, throughout western European regions.



Source: Laurent, Filleul, Havard, Deguen, Bard (2008)

Titles: Interventions for asthma, standardized incidence report on age (SIR) according to socio-economic level; SIR interventions for asthma; Decreasing socio-economic level

Graph. 1 Correlation between interventions for asthma and socio-economic status in Strasbourg (France)

## 2.2 What justice do we mean when we speak of environmental inequalities?

### 2.2.1 Conceptions of the environment

These data, which we could easily extend to many geographic areas and countries, provide us with several spatial findings on environmental disparity situations. However, they are often still purely descriptive and static, and frequently address only pollution, nuisances and risks. They express a conventional characterization of environmental inequalities: proportionally higher physico-chemical exposure of low income populations to environmental loads and sometimes to negative effects (on health, for example). They also share one characteristic - they often only minimally address the socio-spatial dynamics and segregation mechanisms that underpin the relative inequality in the environmental field, particularly in cities where such mechanisms can be highly complex (Faburel, 2008). Thus, they ignore possible connections between different types of social and environmental inequalities. All this static information in fact ignores the dynamic nature of all inequality: *"differences that are the result of unequal access to the diverse resources offered by society"*.

How then, on the basis of only the exposure of populations, can we pinpoint the role of the environment in mechanisms of segregation? How can one explain that although affluent city centers are often subject to high noise and air pollution exposure levels, caused by heavy automobile traffic, they are the object of urban requalification measures? Does this mean that to ensure justice, everyone should get their equal "share" of exposure, regardless of the socio-economic means available to avoid it? Could it be that environmental and/or ecological inequalities are only social inequalities which, relatively to the physical, chemical etc. attributes of the living environment, highlight other aspects of the historical production of social divisions of and in places? On the other hand, are such inequalities not one of the

most difficult challenges we must face in view of their economic, cultural, social, psychological, environmental components? What then is their specific content? How should one view such inequalities in a more equitable urban perspective, in the name of sustainable development?

In fact, if these data generate other geographies and territorial characteristics at different scales, notably by means of mappings (*supra*), they above all question the concept of the environment that is involved. The statistics used are in fact generated by the historical assessment apparatus: nomenclatures, protocols and data. In France, this apparatus is inherited directly, as in many other countries, whether centralist or federalist (see '*materialist ethos of sustainability*' by Shirazi, 2011, from Germany), from a techno-centered approach to the environment (Theys, 2010), i.e. to a cognitive institutional rationale, "*conditioned by the possibility of aligning it (the environment) on a normative measure*" (Charvolin, 2003, p. 9). Expert and globalizing assessment criteria are often applied:

- thresholds of physico-chemical exposure (for air quality, for example),
  - probabilities of the occurrence of official risks (for example to regulate housing construction in response to potential flood risks and hazards),
  - acoustic levels as predictors of annoyance (problems of noise nuisance),
  - distance for the accessibility of urban amenities (e.g. green spaces),
- ...

In our opinion, this very normative and thus objectifying approach to the environment is not appropriate for environmental policies, be they national or local, yet it influences all public policies. For example, the national observatory of so called Sensitive Urban Areas (Zones Urbaines Sensibles - ZUS)<sup>1</sup> recently showed that they suffer particularly from nuisances, pollution and environmental risks; it used approaches that were technical as well as surveys (Choffel, 2004): 38% of households living in ZUS areas declared that they were often bothered by noise, as against 20% of the inhabitants of low-rise residential areas; only 36% were satisfied with the abundance and quality of green areas in their neighbourhood, against 59% in non-ZUS areas. Other applications of these studies also indicate that children from families with a poor standard of living are overexposed to environmental nuisances (Rizk, 2003). However, although this qualitative opening is noteworthy, the psycho-sociological relations with the environment are viewed only within the strict perimeter of the neighbourhood. Also, the housing issue does not address all territorial aspects of the environment (access to nature, mobility, consumption attitudes).

The examples in the box below also illustrate the effects of such initiatives on the scientific understanding of environmental inequalities.

Why is this straitjacket imposed on official nomenclatures and institutional perimeters, including urban policies, although the latter are traditionally prone to opt for more qualitative and social approaches to the facts and mechanisms of inequality?

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<sup>1</sup> Sensitive Urban Areas (ZUS) are infra-urban areas (e.g. neighbourhoods) which French public policy makers have defined as a priority target for urban policies, in view of the difficulties which their inhabitants encounter constantly (increasingly important fiscal and social provisions). There were 640 of them in metropolitan France in 2005.

Box 1. Some surprises and difficulties when approaching situations of environmental inequality: the case of large-scale transport equipment and infrastructure

Kruize analyzed environmental equity on the scale of the Netherlands and of two strongly urbanized regions, including the Amsterdam-Schiphol airport zone (2007). Environmental inequalities were analyzed according to the distribution of environmental “minuses” (“bads”), i.e. situations that did not comply with statutory norms, and of environmental pluses (“goods”), i.e. those that complied with the norms or fixed objectives, by income categories. As environmental indicators she used: noise levels (as defined by the statutory indicator), azote oxides rate (compared to thresholds of concentration in the air), official risks (planned zones) and distance to green areas.

The study shows that modest income populations usually live in slightly less environmentally friendly neighbourhoods, with stronger disparities relative to green spaces. The differences observed primarily concern areas in which noise and azote oxide emissions are low. But, surprisingly, the highest income populations are more exposed to noise (i.e. level of acoustical intensity) than populations with the lowest incomes. The author decided to couple this observation with a survey on perceptions and opinions.

Another study that goes back to 2004 (Faburel, Maleyre, 2007) involving eight municipalities in the vicinity of Orly airport (2nd airport in France) made use of the Hedonic Pricing Method to analyze the determinants of the property values of 688 accommodations, selected in the data base of the Paris chamber of notaries public (Chambre des Notaires de Paris). Property value depreciation is observed in the municipalities suffering the highest levels of noise generated by air traffic, with a *Noise Depreciation Index* of 0.96 % of the value, by decibel. This rate concords with what is stated in the literature on the subject, and the municipalities concerned are the poorest in the analyzed sample.

However, thanks to the segmentation of the value bases into several significant periods, one may observe that depreciation increased during the period from 1995 to 2003, going from 0.86% of the price of the property per decibel between the reference municipality and the three municipalities identified at 1.48 %... while noise level remained stable according to official indicators, due to a limitation (cap) on air traffic introduced in 1994.

Indicators based on physico-chemical exposure do not suffice – on the contrary – to explain the dynamic character of non-egalitarian phenomena. “*To draw conclusions with regard to the status of a person’s health and well-being, the perception of exposure may be as important as or even more important than objectively measured exposure*” (Mielck, 2004, cité par Kohlhuber et al, 2006).

### 2.2.2 From concepts of the environment... to concepts of justice

Certainly the environment is still to a large extent viewed in total and universal terms, with prophecies based on technical mastery and the normed reduction of environmental “impacts” feeding into many areas. But above all – and we think this may be the most fundamental reason – any concept of the environment carries with it a concept of justice, since – as demonstrated notably by Peter Wenz (1988) – the environment is specifically linked to such reflection (Faburel, 2010b).

As an example, the *Environmental Justice* trends in the English speaking countries have developed consubstantially:

- a more individualized approach to the environment (at often primarily the local scale), and an essentially distributive justice (based on the measure of environmental values - *preferences-based approaches*), and its theoretical evolution (Rawls, 1971),
- with a few participatory (*Voice* in Hirschman model, 1970) though institutional, aspects (e.g. environmental self-determination, as *class action*), and in a vaster sense, on the capacities to defend, adapt and protect households, as in the Tiebout model ("*feet voting*", 1956).

We also find this aspect in the definition of environmental inequalities that was officially formulated in 1995 by the US Environmental Protection Agency in a first handbook, *Environmental Justice Strategy*; this included a *toolkit* (indicators and quantitative tools), that was updated in 2004: "*Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, colour, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies*". To this day, because it is grounded on regulation environmental studies, this framework remains highly relevant for waste storage depots and recycling sites, chemical plants, transport infrastructure (roads and airports), almost exclusively from the point of view of the potential or actual pollution they emit, as well as other risks and nuisances.

Most prevalent in European countries, especially the UK and Ireland, this working definition has moved away from racial discrimination to concentrate on social exclusion and environmental issues (Fairburn, 2008) with a specific focus on industrial polluters and clean air campaigns. But these slight differences between countries, for example in how social and ethnic divisions are measured, cannot hide a common factor: the way a concern for equity at the local level tends to strongly influence how we think about environmental issues. Again, in the UK, for instance, there is a tendency to privilege health and epidemiology. And the examples we have cited above at national scale are representative of the production of approaches of this type.

Similarly, with the approach via ecological inequalities of development, which positions itself at the global scale of development models (production conditions, technical systems, forms of social organization) to observe the ecological consequences of inequalities (internal) and disparities in poverty (external), another concept of the environment unfolds, more oriented towards ecological rights and obligations of societies (*rights-based approaches*, in Martinez-Alier, 2002). So by focusing on economic phenomena such as environmental dumping as a by-product of free trade policies (see Baumol and Oates, 1988) and more recent political defeats (such as in some cases a lack of regulation policies), the links between social inequalities, poverty and environmental disasters become clearer. The examples cited above at international scale (e.g. the 2007 Report of the Intergovernmental Panel on Climate Change - IPCC) perfectly illustrate this approach.

Moreover, it is more open to the diversity of lifestyles of populations. We can cite Pye et al's work (2008) which shows empirically how poor Europeans (single parent, low income or unemployed households) have a far lower carbon footprint than others. In this vein the work of Diamantopoulos, Schlegelmilch, Sinkoviks and Bolhen (2003) illustrates at the same scale the decreasing relevance of socio-demographic factors in green consumption habits.

This focus on how much waste our consumerist lifestyles generate also appears in the work of Dozzi, Lennert and Wallenborn (2008) carried out in Belgium at a microlevel: they looked at energy consumption and household spending on water and food including production and delivery costs. Other qualifications are thus given to environmental inequalities, such as those that Pye et al offer in their European Commission report (*op. cit.*): these include discrimination in terms of how different residents are able to access a green lifestyle (where social exclusion exists) and the uneven effects of environmental policies on these same residents.

Above all, this approach brings with it a conception of justice which is somewhat different (Dobson, 1998): much more social and openly procedural (focused on citizen involvement) than strictly (re)distributive at the economic level (via economic compensation for the weakest, for example). And, on this dual basis, the second approach pleads for the need of public action that is more re-founding than simply corrective or compensatory (as in the *Environmental Justice* approach), in order to more effectively face environmental inequalities.

Thus, over and above the common terms they use (inequalities, injustices, vulnerability), these two approaches differ greatly; the 1<sup>st</sup> focuses on epidemiological studies of risks, the 2<sup>nd</sup> more on social or ecological aspects. The second generates much more will for political change, although with undeniably different positions concerning the distribution of rights and duties. These differences both express and feed relatively different conceptions of the environment (and of justice): in the time scale they imply, notably for the no less diverse modalities of the regulations they propose; in the spatial frame of reference, much more micro-spatial for the 1<sup>st</sup>, revolving around individuals and their local collectivities, more macro-spatial for the 2<sup>nd</sup>, implying other forms of social organization and related conceptions of justice (more social and procedural).

Despite those approaches, in France, as in many other European countries, except for those cited above, the issue of environmental inequalities apparently suffers from a lack of political focus (Theys, 2007), and continues to be dealt with mainly in scientific publications. It is true that these, present also in Germany, seem to point towards a socio-urban opening: a meso-spatial reading (see for instance De Palma, Motamedi, Picard and Waddell, 2007). However, in the socio-urban and regional approach, frequent overlappings confirm that the content is far from stable, for example for such terms as risk, vulnerability, territorial disparities, environmental justice, spatial equity, ecological inequalities. To the point that we do not really seem to know the real specificity (does it exist?) of environmental as against social inequalities. Thus, things could be qualified in much broader terms, for example environmental inequalities could be described as follows: "*A difference in the situation between individuals or social groups that may be noted not only with reference to "ecological" considerations strictly speaking (pollution, public hygiene, natural environment), but also in terms of living space, accessible renewable resources, quality of human places, living conditions, landscapes, etc., this difference being seen as contrary to the rights and respect for the individual, and moreover likely the generate an imbalance that is harmful to the satisfactory functioning of the community*" (French committee for the Sustainable Development World Summit in Johannesburg, 2002, p. 164).

Yet it still fails to contribute to the nascent debate on sustainable development, although environmental inequalities are among the few issues that truly combine environmental, economic and social stakes (and "pillars"). It should certainly be viewed as a political aporia relative to sustainable development - which could, in theory at least, make public some of its

aspects. Promoted by some as the nascent rationale for public action, notably in Europe (Beatley, 2000), in the area of urban planning and design (Riddell, 2004; Wheeler and Beatley, 2004; Ascher, 2004), even environment (Mazmanian and Kraft, 1999), it is frequently criticized in France for its empty eloquence which makes it possible to institutionally avoid essential reflections on the measures that must be taken in the face of economic, ecological and food crises (Lascoumes, 2001 ; Puech, 2011). While some authors view it in terms of a pragmatic construction of a meta-narrative (Rumpala, 2010), others report highly unequal territorial experiences, in which once again physico-chemical approaches to the environment (*supra*) or values defended, play an essential differentiating role (cf. notably, for the United States, Portney, 2003). And above all, many criticize its incapacity born of its generalization (every sector now boasts of its sustainability), its failure to prove its specificity and convincingly argue its fundamental and concrete contributions required to meet recognized challenges (e.g. climate change).

However, since this lack of ambition relative to environmental inequalities applies above all to France (cf. approaches abroad, *supra*), and since there can be no doubt that the links between conceptions of the environment and of justice, the republican tradition relative to the social pact and equality of treatment, the forms of injustice to which it also may have contributed (environmental?), have also marked it heavily. Thus, what conceptions of justice and of the environment should be debated in France? On what knowledge basis concerning environmental inequalities? For what view of urban sustainability?

## **2.3 The primary forms of environmental injustice: social inequity in the commitment to socio-ecological change**

### **2.3.1 Towards a cosmopolitical approach**

Certain economists consider that due to the vital questions relative to social justice in terms of environmental inequalities, we dispose of a first lever to socialize the environment via its (un)egalitarian aspects, as well as via a nascent perspective of a social ecology, given more egalitarian democracies (Laurent, 2010). This is certainly the case. But thanks to a reading that draws upon a cosmopolitical approach to the environment (see for instance debate between U. Beck and B. Latour in 2004), notably in its links with land use planning (Lolive and Soubeyran, 2007), the interest of this subject (but also certainly its failure to generate political reflection) is – we think – a different one. The issue is not to uniquely revise the founding myths (e.g. egalitarian), thus advocating compromises between economical progress and environmental conservation (*op. cit.*), but to fully establish them anew by means of:

- cornerstone questions which this subject would address consubstantially with concepts of justice and the environment,
- but also to be addressed to our 'governmentality' (e.g. the exercise of democracy in our liberal/free-market societies),
- in order to become fully aware of the means provided by the environment (human and non-human) to change our societies, their development models and modes of government, i.e. of a number of values and principles that have been advocated until now.

Everyone knows that over the last thirty years the environment has everywhere imposed itself as one of the most powerful filters for the understanding and interpretation of the

living environment, and thus as one of the primary operators of our reflections on modernity:

- the finite nature of resources and ecological irreversibility,
- the desynchronization of environmental time with time in terms of development,
- the growing distance between the spaces where problems occur and where decisions are made,
- with for example a growing lack of predictability relative to the effects of the “rationale” of modernist planning on places and its societies.

In France particularly, this change is observable in a certain number of recent programmatic aspirations or, essentially, watchwords which are often adequate in urban planning or urbanism fields: territorial energy transition, dense/slow city/short distance cities... and the post-Kyoto “paradigm” (cf. Greater Paris<sup>2</sup>). However, these aspirations do not compete with other aims relative to change, notably community or affinity-group-based solutions in the United Kingdom (e.g. *Cities in Transition*). In France, such bottom-up initiatives are still few and far between and rarely popularized (e.g. *Relocalisons !* movement).

Embodying values (esthetic, heritage-based, symbolic...), “*environmental situations*” and their “*qualitative variations*”, terms which though dynamic are present everywhere in the literature on environmental inequalities<sup>3</sup>, and more and more often mediate our relationship to (the) world(s). The growing importance of environmental considerations in the residential choices of households, in individuals’ choices of transportation mode, in nutritional practices and individual energy choices... and even in our lifestyles and involvements in associations and local communities, shows this every day. Thus the environment contributes to a gradual re-founding of the joint government of humans and nature, reviewing certain values and action principles (Boltanski and Thévenot, 1991), particularly for policies with a strong territorial basis (land use planning, urban design, nature protection). According to Beck (1995), Latour (2004b)... this conception even announces, in different ways, a new age of politics, an age in which relations to identity, notably spatial identity, are being composed anew, to the extent that they shake up the historic chain of the construction of public action, above all in countries with a centralist tradition: a certain production of the rationalities (techno-scientific) for a certain exercise of democracy (delegative) (Stengers, 1997).

This larger purpose may even be found in certain recent French studies of environmental inequalities (below).

Box 2. When a more dynamic view of the environment raises the issue of time and space scales in the apprehension of environmental inequalities (French cases)

Having noted a lack of prospective and dynamic approaches to territories, Laigle (2005) proposes a territorial analysis of the urban dynamics that generate environmental inequalities, based on four cases: regions/territories characterized by a heavy industrial

<sup>2</sup> A choice which is apparently justified by environmental inequalities as evoked in the presidential discourse when the different architectural projects were presented in 2009.

<sup>3</sup> “*Environmental inequalities are inequalities of situation (...) resulting from qualitative variations of the urban environment*” (Inspection Générale de l’Environnement, French Ministry of Ecology and Sustainable Development 2005, p. 11).

past (Lille agglomeration – North of France), regions that are attractive economically and residentially (the Mediterranean agglomerations of Aix-en-Provence and Toulouse), territories or regions characterized by multipolar expansion (Strasbourg agglomeration, in the Rhein region).

Globally, the analysis generated two types of configurations, which according to the author encourage cumulative links: “*configurations in which past urbanization overlapping with industrialization resulted in: social deterioration, a degraded living environment making economic and urban reconversion difficult*”; “*configurations characterized by attractive economic and residential conditions, based on the quality of the living environment, which may strengthen selective factors of access to urbanity and – paradoxically – damage the quality of the environment.*” (p. 11).

Thus, local pathways, trajectories, heritage, as well as priority orientations and the dynamics of contemporary territorial action should be placed squarely in the center of the analysis of environmental inequalities. Further proof of this is supplied by the studies on the industrial heritage in the Seine-Saint-Denis department, to the northeast of Paris (from 1850 to 2000, cf. Guillerme, Jigaudon and Lefort, 2004), which gave rise to a historic phenomenon of discrimination and environmental and social segregation, notably due to choices made by public authorities, in spite of several recent large-scale requalification programs.

Picking up on the idea of cumulative disparities, Deboudt, Deldrève, Houillon and Paris (2008) examined a narrower, coastal territory: the Chemin Vert neighbourhood in Boulogne-sur-Mer (coastal industrial municipality in northern France). It was marked by its connection with the development of sea transport, tourism, port and residential economies, and thus by spaces with a high ecological value.

Their findings demonstrate firstly that social inequalities are cumulative (over-representation of unemployment, single parenthood, low income), and marginalization that is also geographic (remoteness to city center, topographic disparities, cuts in the urban tissue, few public spaces). Above all, there are few nuisance factors and the area is not vulnerable to natural hazards, with even a potential for amenities and enhancement. Consequently, urban policies wish to make use of this potential, notably by valorizing the “maritime” aspect.

However, according to a survey of the inhabitants, if the coastal environment is certainly seen as an element identifying and enhancing the living environment and a source of amenities, the inhabitants do not think that it should be preserved, since memories of the maritime past are not very strong, and the maritime professions are not in high regard. Thus, over and above the single issue of amenities and environmental practices, the study proposes to approach the subject from the point of view of the social value(s) ascribed to the environment. “*In a situation in which the inhabitants do not directly identify with the “maritime” concept, massive and qualitative public intervention leads to a paradoxical syndrome in certain individuals who ask themselves if they are “worthy of these new homes”*” (p. 189).

This leads to a proposed analysis: should the analysis of inequalities, cumulative effects, and vulnerability aspects not be oriented more towards the spatial scale of ecosystems and human settings, as the historic crucible of the environmental offer and the social

values attached to it?

Thus, more than just crossing static data, should not any investigation of environmental inequalities position itself with respect to privileged time scales (local itineraries and heritage, public and private arbitration in the past, current territorial strategies), and to the observed spatial scales (ecological or territorial ones, areas of practices, historic districts and divisions...).

### 2.3.2 The individual involvement capacities at the heart of environmental issues

Thus we think that the very first “disturbance” introduced by the subject of environmental inequalities, particularly in an urban analysis, is that in theory it makes possible a much more dynamic and active screening of a model of social equality, and its spatial correlations in land use planning, urban design, environmental protection policies. Here, beside the social aspect with the revitalization/reconfiguration of links (e.g. the importance of nature for local forms of solidarity in cities, in the North as in the South), or that of the economy of the new trends/sectors of locally-oriented production (ecological housing, local consumption of agricultural and cooperative products...), it first examines this model from the point of view of the “*myth of the passive citizen*” which makes this model operational (Rosanvallon, 2008). Individuals as subjects aspire more and more often to different ways of life and commitments, often invoking nature and the environment (see for instance Haanpää, 2007, for the role of lifestyles or Jagers, 2009, for the role of perceived ideologies in commitments; see also Dobré and Juan, 2009, for French cases). Also, the constitution of new, more informal collective entities, increasingly underpins no less social forms of mobilization (Lolive, 2010), also via different relations to the environment and to nature (e.g. sustainable/ecological/green communities in Roseland, 1997; and the return to Urban Design in Beatley, 2010).

From the point of view of the relationship between society and the environment we are encouraged to consider the contribution of environmental inequalities to the debate on sustainable development, in terms of both individual and collective capacities of involvement, and to examine their non-egalitarian social distribution and the very scope of such inequalities in the capacity for change. Let us also note the presence across-the-board, though with very different modalities (sometimes strictly regulated) of so-called citizen participation in the approaches targeting environmental inequalities that were discussed above (*Environmental Justice*, Ecological inequalities of development). This contradicts the official report of the Inspection Générale de l'Environnement (Diebolt and al., 2005, for French Ministry of Ecology and Sustainable Development, Transport and Housing) which denies this participatory dimension as an integral part of the issue of environmental inequalities.

In fact, it is here that we would today place the primary forms of environmental injustice. No longer simply disparities of exposure (although this interpretation remains useful for the detection of long term sanitary impacts, cf. Roussel, 2010), but gross social injustice relative to more individualized forms of access to formal or informal involvement (lifestyle commitments, unaffiliated collectives...) in socio-ecological transition. For, even though studies, mainly conducted in English-speaking countries, tend to show that the poor are increasingly involved in local causes (cf. case studied by Corburn, 2005), such capacities to influence environmental situations and the mechanisms behind environmental inequalities

are no less unequally distributed than other capacities (Beck, 2001), as stipulated in Article 3.9 of the Aarhus Convention (1998), of which the countries of the European Union are signatories.

This would imply placing the means for change (still inequitable) at the heart of the reflection on sustainable development, perhaps in greater measure than social equality as a finality, which we know to be globally non-environmental (e.g. redistributive approaches of social and urban policies). This could also generate other axiological pluses, bearing witness to the scope of socio-political implications of a collective examination of environmental justice. This more dynamic and active option lies in fact at the crossroads of the various dividing lines:

- from the individual freedom to act, which is certainly a fundamental right inscribed upon the pediment of our liberal democracies, but which also – due to their backing of free market societies - suffers from all the spatial divisions which they are subject to as a result of social inequalities... to the responsibility, not via environmental education but via accompanying the poor in the definition of the stakes and the improvement of their own disparate environmental situations<sup>4</sup>,
- from social mixity - and intergenerational mixity, which is at the forefront of sustainable development - via quotas and regulatory provisions often still implemented topdown on the strength of norms that are taken for granted (concerning the proportion of subsidized housing, for example) to more fundamental forms of solidarity which are spreading notably for and through nature (since we know that living together does not necessarily mean exchanging, and even less sharing or helping each other).

Without including – always in terms of values and principles – this conception of the environment in the moderation and sobriety displayed by certain lifestyles, or in the self-sufficiency which is increasingly invoked by local economy projects.

### 2.3.3 Inhabitants, lifestyles, and their places as subjects of environmental inequality?

As a result we have at least one proposal on the subject of environmental inequalities in the perspective of sustainability. It advocates the use of other conceptions of both the environment and of justice in public policies, which a possible horizon of sustainability should address (Faburel, 2010b). Thus it would seem that the concept of the environment presented here focuses on the environment as it has become, i.e. “*on the qualitative differences between situations*” (*supra*), recognizing the links and perception relations of local societies to the environment. “*To perceive an atmosphere as sustainable, the physical dimension must meet the expectations of our existential living body; otherwise, an individual never perceives the environment as “sustainable” and never achieves a “sustainable status”*” (Shirazi, 2011, p. 8). This would call for an egalitarian project that would finally be open to socio-environmental singularities, to the ways in which they are lived and experienced through the inhabitants’ sensibility, and how they are recognized by local knowledge (Fisher, 2000)... in short how they are embedded in ecological ways of living, lifestyles and involvements, in an cosmopolitical perspective of sustainability.

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<sup>4</sup> Rather than for example to simply let households change their environment by residential mobility and its market stimulations, thus negatively positioning certain settings (environments).

The concept of justice would thus move away from an interpretation based on only (re)distributive justice (with an egalitarian motivation but liberal rationale), characterized notably in France by its real estate (rehabilitation/renovation, housing offers) and urban aspects (the *Promethean* approach of land use planning, uniformization of public spaces, social insertion via state-imposed policies). It would be more procedural (e.g. participatory) than structural and merely (re)distributive, based on the capacity of poor populations and their place to face up to dynamic and inherited contexts via their own local experience. It would thus admit that citizenship can be differentiated (Young, 1990)<sup>5</sup>, and therefore open to other factors of inequality than only individual income, and above all mindful of the rights of affinity-based groups (and not just community-based ones). In brief, following Schlosberg (2004) and Jamieson (2007), environmental justice needs to address not only the distribution of environmental harms and benefits, but also people's participation in decision-making processes, including recognition of people's particular identities and visions of a desirable life.

On this reflexive and conceptual basis which develops a cosmopolitical approach to environmental stakes, a more phenomenological conception of the subject-individual, and a critical reading of the consubstantially dominant accepted meanings of the environment and of justice, in 2008 we conducted an empirical study of environmental inequalities in the Ile-de-France, i.e. the capital region of France (11.6 million inhabitants). The realization and results of this project are discussed below.

### **3. Lived environmental experience, satisfaction and quality of life in the Ile-de-France region. A different regional geography of environmental inequalities**

#### **3.1 A pluridisciplinary approach and a multi-scale procedure**

As already stated in the previous section, several statistical observations tend to demonstrate the existence of environmental inequalities in France and abroad, both now and in the past. However, we have also seen that when conducted at scale-level, these studies generated numerous conceptions in which the environment and justice overlapped; they were also less and less adequate to the development of other approaches, better adapted to the changes that our societies are subject to as a result of the environmental situation and the challenges it brings: a gradual reformulation of the joint government of the human element and nature, revising certain values and action principles of our so-called reflexive modernity (Giddens, 1991). The system of environmental evaluation that still dominates worldwide, i.e. principally technical, physico-chemical approaches, to normative ends for environmental protection, and their regulatory and operational relays (*Environmental Impact Assessment, Strategic Environmental Assessment...*) is increasingly ill adapted to disclose the scope of a territorialized phenomenon, which has at least as much to do with the socio-environmental as the bio-physical domain: environmental inequalities and injustices. From its strictly evaluative aspect, this system still strongly depends on the segmentation of knowledge and scientific disciplines, on their disparate recognition by the powers-that-be, and – not to say above all – on a vision of the inhabitants as “statistical individuals”. This gives rise to a lack of instruments of territorialized assessment, particularly in the cities, where socio-spatial and segregatory mechanisms are particularly

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<sup>5</sup> For an application to urban policies, cf. Harvey (1992).

powerful, and old (Faburel, 2008). Such methodological obstacles or even limitations both contribute to and embody the deficits in the scientific recognition (techno-scientific production of rationalities) and the political action targeting such inequalities (delegative exercise of democracy).

The current scientific literature increasingly calls for pluridisciplinary, or even interdisciplinary approaches, in the attempt to integrate at least some elements of the inhabitants' living experience, complementing or contradicting existing observation and information systems. Since, where socio-environmental issues as well as others are concerned, the gap between what is given by so-called objective environmental data and what the population feels and experiences constantly widens. And, as already noted (cf. Box 2.), concerning the question of environmental inequalities, "*studies to clarify the relationships between objective and perceived exposure and the influence of social status on the perception of environmental exposures are still necessary*" (Kohlhuber et al, 2006, p. 254).

Conducted between 2006 and 2008 (Faburel and Gueymard, 2008) for the French Ministry of Ecology, Sustainable Development, Transport and Housing, for its *Territorial policies and sustainable development* research program (2005-2009), in close cooperation with the Ile-de-France (Paris) region, the research, a synthesis of which is presented here, had the primary objective of establishing a different geography of environmental inequalities.

On the one hand this geography confronts environmental disparities made apparent by the crossing of physico-chemical data<sup>6</sup> with no less institutional data relative to official socio-economic spatial characterization (income levels, proportion of subsidized housing, unemployment rates). More importantly, these observations of disparity were then compared with information on the living and felt environment, by means of local experiences, satisfaction, place attachment and political expectations relating to the environmental qualities which generated these observations. The aim was therefore to implement a perceptual and well-founded observation of "objectively" described socio-environmental situations, while opening oneself to the symbolic and identity factors that are at the basis of the attraction, attachment to or refusal of certain places by the populations. Within this framework, a further aim was to improve the understanding of operative mechanisms, notably residential ones, in the phenomena of spatial polarization for environmental reasons at a regional scale.

Several specific questions guided this work:

- How do people perceive and judge environmental quality, and what experiences and expectations ground their points of view, notably during residential arbitration procedures?
- How far do conventional indicators make it possible to register real satisfaction or dissatisfaction, when taken out of a given environment?
- How then can one imagine a system of observation and measure that could best account for the influence of the quality/non-quality of the environment on individual decisions, and explain certain phenomena of inequality and segregation, and the resulting territorial dynamics?

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<sup>6</sup> Thresholds of chemical exposure for air quality; probabilities of risks occurrence, flood risks and hazards for instance; acoustic levels for noise nuisance; distance for the accessibility of urban amenities, of green spaces...

In fact, we think that, due to its territoriality and resulting transversality, the register of the personal lived experiences and of environmental satisfaction constitutes a non-negligible source of information, which could prove essential to:

- (re)define the analytic frameworks of these situations which until now have been mainly perceived as “objectively” unequal, often presented as a “combination” of environmental degradation and socio-historical spatial disqualification (i.e. disparities),
- shed a light on potential levers for sustainable action, thus contributing to the entry into politics of a fully socio-environmental set of problems which are still rarely viewed from the perspective of public intervention and change (i.e. injustices),
- for example, by observing the aptitude of the current environmental evaluation system to describe a fully territorialized phenomenon, defined at least as much by felt, symbolic and axiological relations of local societies with their living space, as by largely accounted for physical or social characteristics (i.e. inequalities).

This was our first working hypothesis. The second resulted from it: the subject-individual, via his lived environmental experience and the cognitive and social transactions he operates, constitutes together with his immediate living environment, a pertinent scale of observation. Unlike the “statistical individual”, this scale enables to both “territorialize” environmental quality, and to highlight certain determining dynamic factors of inequalities in this area, in order to perhaps differently ground no less territorial decision making.

Exploring the two dimensions of environmental inequalities, which are usually called “objective” and “subjective”, first raised the question of the reference scale for observation. Working on the Ile-de-France<sup>7</sup> region, we opted for different, though complementary scales. This confrontation and overlapping of scales of analysis is also part of an approach underpinned by the territorialization of public action, particularly with reference to sustainable development: the progressive structuring of areas of competence (subsidiarity principle) and decision making levels (territorial governance) around the reality of phenomena and pertinent new scales of observation.

Two successive stages at two scales defined our empirical work. First, we made a conventional reading of environmental disparities, at regional scale, by spatializing so-called objective environmental data and crossing them with classical socio-economic and demographic data. The second step was to select six municipalities in the different environmental situations identified, with the aim to analyze inequalities of lived environmental experience. A survey was conducted with 600 inhabitants, face to face. However, in view of the size of the sample (600 questionnaires) and the various criteria which defined the choice of our sites as well as of our groups of individuals, we did not aim for representativity at a scale of a region with a population of 11.6 million. We thus adopted an essentially exploratory perspective, with a view to preparing the ground for a different system of observation, fully focused on environmental inequalities as linked to individuals’ lived experience, in order to understand certain phenomena and mechanisms of dynamic socio-environmental spatial polarization. With this exploratory view, we developed and adopted a dual approach, referring to both spatial analysis (quantitative)

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<sup>7</sup> Capital region of France, the Ile-de-France is the most densely populated with 11.6 million inhabitants, 90 % of whom live in the (Paris) agglomeration which covers 20 % of the regional territory.

and socio-cognitive investigation (qualitative), highlighting inhabitants and the socio-cognitive transactions with their living environment and the environment as such. Thus, our work closely combined geographical, economic, sociological and psychological knowledge.

### **3.2 A static reading of environmental inequalities in the Ile-de-France (Paris) region**

The first stage of our work was to draw up a geography of environmental disparities at the regional scale, by setting up two typologies (environmental and socio-economic).

#### **3.2.1 Construction of two multi-criteria typologies: choice of indicators and statistical method**

To set up the environmental typology, we selected both classical criteria and indicators, but also such as are liable to interact with lived environmental experience and the environmental satisfaction of populations. We thought it important to address several thematic environmental registers by taking an interest in diverse environmental objects, referring certain of them to the sensitivity register (e.g.: noise) and above all such as could have contrasting effects (some perceived as agreeable, others as disagreeable). Twelve indicators, grouped into two families, which for clarity's sake we designated as resources and harms, were noted at the scale of the 1 300 municipalities in the Ile-de-France region.

In a next step, the environmental typology was established on the basis of discretization between 3 average classes (+/- standard deviation) for each of the variables. The different environmental parameters were then aggregated by calculating two weighted multi-criteria averages – average resources and average harms; based on certain findings concerning residential choices and on a conventional hierarchy of nuisances and risks in the Paris region (cf. 2.2.1). This calculation generated nine possible combinations, depending on different resource and harm levels, and 9 environmental groups, with at the two extremes: environments designated as very favourable or very degraded. For greater clarity, these different groups were then combined within three great environmental categories: good, average, bad.

This general map of environmental categories establishes a geography of disparities by clearly emphasizing areas of so-called “objective” good or bad environmental quality. These major disparities are generated by structural factors which have been known for a certain time, notably:

- the center, which corresponds to the heart of the Paris region, with mediocre environmental quality (density of infrastructures and of centers of economic activity, lack of vegetation...),
- municipalities that are environmentally and traditionally the most disadvantaged are mainly located in northeastern Paris, owing to an industrial past, but also to political choices to concentrate infrastructure and equipment, above all relative to traffic: in the Seine-St-Denis (93), in the northern Hauts-de-Seine (92), in southeastern Val-d'Oise (95) – along the “francilienne” (by-pass motorway for the agglomeration) and close to Roissy Charles de Gaulle airport (2nd airport in Europe),

	<b>Environmental variables</b>
<b>Resources</b>	Green*surface areas with possible landscape value (in % of municipal area)
	Population living close to green spaces open to the public (within a perimeter of 250 meters to 1.2 kilometers, depending on size of the space, in % of the municipal population)
	Surface of listed areas** (in % of the municipal surface area)
	Population living close to waterways and bodies of water (within a perimeter of 100 to 500 meters, in % of the municipal population)
<b>Harms</b>	Annual average nitrogen dioxide (NO <sub>2</sub> ) level (2005)
	Population potentially concerned by local pollution *** (in % of municipal population)
	Population living in the flooding zone (in % of the municipal population)
	Population living close to a Seveso II**** class industrial site (within a radius of 500 meters, in % of the municipal population)
	Population exposed to aircraft noise caused by traffic at major airports***** (in % of municipal population)
	Population exposed to aircraft noise caused by traffic at small airports***** (in % of municipal population)
	Population living within railway traffic noise "hot spots" (in % of municipal population)
Number of road segments with noise emissions higher than the hot spots daytime noise threshold (in % of the studied road area)	

\* Notably includes natural and agricultural lands, open urban gardens (allotment gardens, private family gardens), hippodromes, golfs and cemeteries.

\*\* Designates listed sites and historic monuments, protected urban areas, protected urban architecture and landscape heritage areas (Zones de Protection du Patrimoine Architectural Urbain et Paysager, ZPPAUP).

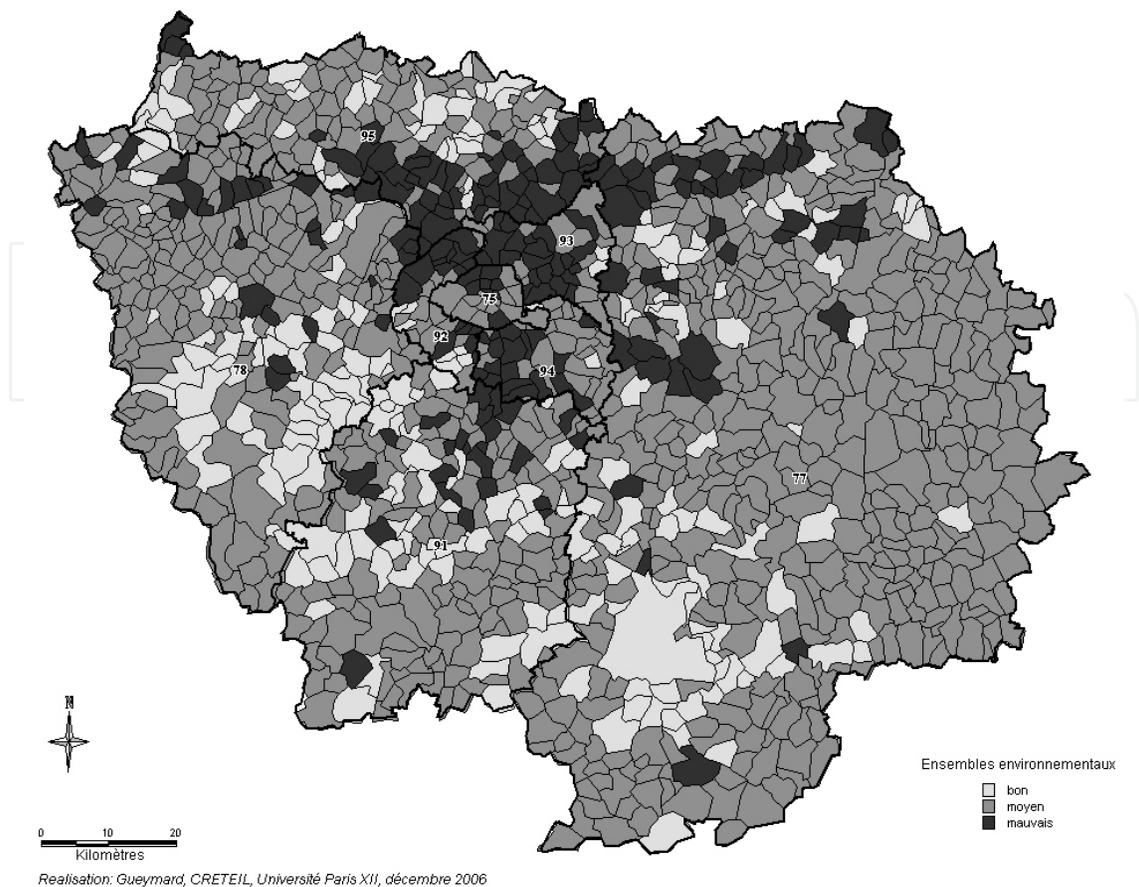
\*\*\* Population living close to (100 meters) road segments with annual average NO<sub>2</sub> levels higher than the annual quality objective, established by the air quality protection plan (Plan de Protection de l'Atmosphère, PPA) (2005-2010) and taken up by the air quality monitoring program for the Ile-de-France (Programme de Surveillance de la Qualité de l'Air en Ile-de-France, PSQA) for 2004.

\*\*\*\* The so-called Seveso directive or directive 96/82/EC is a European directive that imposes the obligation upon all EU member states to identify all industrial sites presenting major risks of accident. The directive, which was made official on 24 June 1982, was modified on 9 December 1996 (Seveso II) and amended in 2003 (2003/105/EC). Companies are listed according to the quantities and types of hazardous products they handle.

\*\*\*\*\* Populations included in the nuisance mitigation schemes (Plans de Gêne Sonore, PGS) for soundproofing grants, of Charles de Gaulle and Orly airports (1<sup>st</sup> and 2<sup>nd</sup> in France, 16<sup>th</sup> in Europe), or flown over at an altitude of less than 1000 meters.

\*\*\*\*\* Populations living in impact areas of other small airports, included in a land use compatibility noise program (Plan d'Exposition au Bruit, PEB) or, if no such program exists, within a radius of 1000 meters around the operator's infrastructural impact.

Table 2. Environmental variables selected to establish a descriptive geography of environmental disparities in the Ile-de-France region Source: Faburel et Gueymard (2008)



Map 2. Distribution of Ile-de-France municipalities among 3 environmental categories

- other smaller but also degraded sub-areas are located in the Val-de-Marne (94), close to Orly airport (2<sup>nd</sup> airport in France) and in the vicinity of the major motorways (A6 and A10), but sometimes also in the “second ring”, at the peri-urban border of the northeastern agglomeration, notably in the Seine et Marne (77), owing to an influx of populations that can no longer cope with the cost of living in the center,
- and, at the opposite, the most environmentally favoured municipalities, located more in the west and the south of the agglomeration, mainly in the departments of the “outer ring”, with a major focus here on municipalities close to woodlands and the Regional National Parks (Parcs Naturels Régionaux PNR).

In other words, this first general illustration casts a light on certain structuring oppositions at regional scale (east/west, center/periphery) which are well known to geographers and urban planners. However, a conventional reading of environmental inequalities makes it necessary to cross given environmental characteristics and socio-urban data that are specific to the areas.

So, in parallel, and in the same spirit, we established a socio-economic typology of Ile-de-France municipalities, crossing information with a view to undertaking a first descriptive reading of environmental disparities at regional scale, before rigorously delimiting study areas (*supra*). Always going out from past findings, and in close cooperation with the Ile-de-France (Paris) region, we decided to opt for five variables, accounting for both the socio-economic characteristics of households, and housing stock.

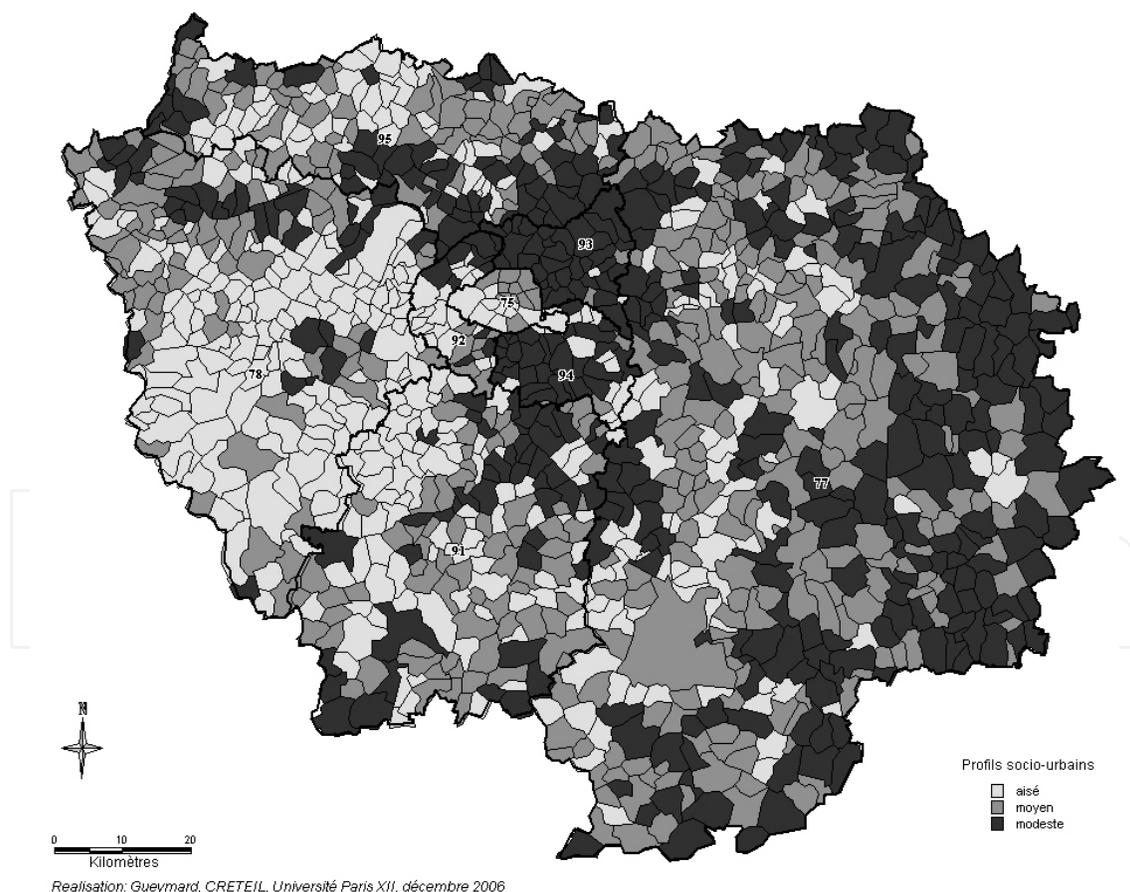
Variables	Sources
Proportion of management level and higher level intermediary professionals	RGP*, 1999
Gross municipal income per inhabitant	DGI**, 2003
Unemployment rate	RGP, 1999
Proportion of tenants in social housing HLM	RGP, 1999
Proportion of social housing (2006)	DGI/DGCL, 2006

\*General Census of the Population (National Institute National for Statistics and Economic Studies)

\*\*General Tax Office (Ministry for the Economy and Finance)

Table 3. Variables to establish a socio-economic typology of municipalities in the Ile-de-France region, Source : Faburel et Gueymard (2008)

The discretization method adopted for these variables was the same as above. For each of the included variables, 3 classes (weak, average, strong) were defined on the basis of the average and the standard deviation. A municipal average was computed for all concerned ranks. Here too, we decided to distinguish between certain variables, by allotting a differentiated weight coefficient when calculating the average. This calculation generated 3 groups (low income, average, well-off).



Map 3. Distribution of Ile-de-France municipalities among 3 socio-urban groups

This other general map comes as no surprise. The regional distribution of socio-urban groups again expresses the industrial past of certain central and peri-central areas of the

agglomeration (e.g.: along the Seine Valley, in southeastern and northeastern Paris), with a social composition that is very different from the municipalities marked by the development of the tertiary sector in the western and southwestern sectors. Here we find again the usual separation between the Seine-Saint-Denis (93), poorest department in the region, and its opposite, the Yvelines (78). It largely coincides with the geography of income (Saint-Julien, François, Mathian, Ribardière, 2002), as well as with other socio-economic large studies (Berger, 2004; Prêteceille, 2003). Above all, this map illustrates the growing recent impoverishment of more remote areas, first of all of the Seine et Marne (77), which since the mid 90s has absorbed households that can no longer afford to live in the agglomeration, and a decline of certain agricultural activities.

### 3.2.2 A first reading of crossed regional environmental disparities, confirming our intuitions

Crossing environmental and social typologies generated a first reading of this phenomenon at regional level. The table below presents the crossed selection generated for the environmental types grouped into 3 categories (good, average, low) and the 3 socio-economic groups.

Environmental category	Socio-economic profile			
	Affluent	Average	Low income	Total
<b>Good</b>	45.53	31.49	22.98	100
<b>Average</b>	33.57	36.15	30.28	100
<b>Low</b>	17,84	32.39	49.77	100

Table 4. Socio-economic profile of the three major environmental categories, Source: Faburel et Gueymard (2008)

Unsurprisingly at this stage, we observe an increasing relation between environmental and social characteristics of municipalities in the region:

- 45.5 % of the municipalities in the good quality environmental category are municipalities with the highest socio-economic profile in the Ile-de-France,
- Symmetrically, almost 50 % of municipalities in the low quality environmental category are municipalities that are home to deprived populations.

Seemingly, these first, general results, confirm the existence of environmental disparities at regional scale, in conventional terms: proportionally more of the poorest households live in environments of low or mediocre quality, according to the standard indicators used to characterize these situations.

Another approach to this phenomenon was to cross it with the presence of Sensitive Urban Areas (Zones Urbaines Sensibles - ZUS). As a reminder - these areas (ZUS) are infra-urban areas (e.g. neighbourhoods) which French public policy makers have defined as a priority target for urban policies, in view of the difficulties which their inhabitants encounter constantly (increasingly important fiscal and social provisions). There were 640 of them in metropolitan France in 2005; of these 138 in the Ile-de-France, with a population of 1.1 million. Here, too, we see a strong link, confirming the several findings that already exist in this field (cf. 2.2.1). The proportion of municipalities in which there are no ZUS is almost of 100 % in the "good" environmental category. On the other hand, ZUS are over-represented

in municipalities with a high level of environmental harms; 20 to 30 %, depending on the type of environment, while the proportion of municipalities with ZUS in the Ile-de-France lies under 10 %.

Environmental category	Presence of ZUS on municipal territory		
	No	Yes	Total
<b>Good</b>	95.74	4.26	100
<b>Average</b>	92.96	7.04	100
<b>Low</b>	73.71	26.29	100

Table 5. Proportion of municipalities with ZUS in the three environmental categories, Source: Faburel et Gueymard (2008)

Nevertheless, if the existence of a global correspondence between socio-economic and environmental characteristics is here clearly apparent at the aggregate scale, what about each environmental factor? Do the environmental factors investigated in our typology confirm this link when taken one by one? Could there be environmental factors which, on the basis of this static “objective” reading, are more likely to feed the disparities we have already noted at this stage?

### 3.2.3 Socio-spatial distribution of environmental objects and the environmental profile of social groups: The structuring role of factors of degradation

The table below gives an example of a crossing between environmental factors and different socio-economic groups. This was in particular established for class 3 of environmental objects, where they are present in greater proportion than in the regional average, and – since they illustrate a “caricature-like” situation - better highlight the specificities of each group’s spatial distribution.

Environmental objects (class 3)	Socio-economic profile (in %)			
	Well-off	Average	Low income	Total
Green spaces	42.42	25.76	31.82	100
Green components	29.88	42.07	28.05	100
Listed spaces (e.g.: ZPPAUP)	45.3	38.46	16.24	100
Waterways and bodies of water	34.2	29.97	35.83	100
Overall pollution (average N02)	3007	21.57	48.37	100
Local pollution	3571	21.43	42.86	100
Flooding zone	2597	19.48	54.55	100
Seveso industrial risk site	1176	47.06	41.18	100
Aircraft noise (major airports )	14.06	40.63	45.31	100
Aircraft noise (small airports)	21.43	57.14	21.43	100
Railway traffic noise	20	31.43	48.57	100
Road traffic noise	31.37	21.57	47.06	100

Table 6. Spatial distribution of social groups according to the above environmental factors, Source: Faburel et Gueymard (2008)

The first global reading of this table confirms the first conclusions. There is indeed a rising linear correlation between environmental factors and socio-economic situations. We observe (gray boxes) that for almost the totality of positive environmental factors, so-called well-off municipalities are much better represented. Symetrically the same observation can be made for poor municipalities.

To validate and further investigate these findings, we then extended these crossings to all the different classes of environmental objects, corresponding to the three classes of distinction (*supra*). In order to easily spot the constitutive environmental factors of the various socio-economic categories, we decided to think in terms of the representation interval (under or over-representation), with reference to the weight of each of the groups in the sample. When assembled, these representation intervals enable the establishment of a hierarchy of the most structuring objects for each group, thus highlighting, via comparison, the environmental factors that appear as the strongest vectors of socio-spatial differentiation.

The table below presents this hierarchy of objects, generated by the digressive classification of representation intervals of groups, from the strongest over-representation to the strongest under-representation.

Socio-economic groups		
Well-off	Average	Low income
Listed sites (e.g.: ZPPAUP) (+) 3	Green components (+)	Seveso (+) 1
Green spaces (+) 4	Air traffic noise (small airports) (+)	Railway traffic noise (+) 2
Overall pollution (+)	Waterways and bodies of water (-)	Local pollution (+) 3
Waterways and bodies of water (-)	Green spaces (-)	Road traffic noise (+) 4
Green components (-)	Listed sites (-)	Air traffic noise (major airports) (+) 5
Road traffic noise (-)	Overall pollution (-)	Flooding zones (+)
Local pollution (-)	Air traffic noise (major airports) (-)	Overall pollution (+)
Flooding zones (-)	Seveso (-)	Green spaces (+)
Air traffic noise (small airports) (-) 6	Flooding zones (-)	Green spaces (+)
Air traffic noise (major airports) (-) 5	Railway traffic noise (-)	Air traffic noise (small airports) (-)
Railway traffic noise (-) 2	Road traffic noise (-)	Listed sites (e.g.: ZPPAUP) (-) 7
Seveso (-) 1	Local pollution (-)	Green components (-) 6

Table 7. Environmental profiles of socio-economic groups, Source : Faburel et Gueymard, 2008

In view of this classification and also going out from the strongest absolute difference in terms of representation (gray boxes), we observe differentiated environmental profiles, profiles with several characteristics. The first characteristic confirms noted disparities, by making them explicit:

- The group of well-off municipalities is defined primarily by a strong under-representation of Seveso class industrial risks, and of railway noise. Only then do we find a strong over-representation of listed sites (listed sites and historic monuments, protected areas, protected urban architecture and landscape heritage areas - Zones de Protection du Patrimoine Architectural Urbain et Paysager), and green spaces; this is followed by a strong under-representation of aircraft noise (from both major airports - Roissy CDG and Orly - and small ones, commercial for instance), all variables taken together.
- On the other hand, the group of municipalities designated as low income is above all affected by an over-representation of harms: Seveso class industrial risks, railway traffic noise, local pollution (nitrogen dioxide levels close to roads) and by road traffic noise. In a smaller measure, this group is also characterized by the presence of aircraft noise generated by the major airports. Only then is it characterized by an under-representation of green components (natural and agricultural spaces, allotment and private family gardens, hippodromes, golf courses, etc) and of listed heritage sites.
- The group of municipalities designated as average is mainly characterized by a much smaller number of discriminating factors, be they positive or negative.

The second characteristic, and perhaps the newest one, is that in fact, at the scale of the three groups, four environmental objects powerfully structure the expected difference between the environmental offer of the most well-off municipalities and the poorest: listed heritage sites, Seveso class industrial risks, railway noise, noise generated by the major Parisian airports.

Finally, a third major characteristic: environmental degradations (expressed in technical and normative terms) appear to be the primary structuring factors of the general assessment, whether positive (due to absence) or negative (due to presence). These factors confirm the results of past studies on environmental issues, notably designating transportation noise as the first source of environmental disqualification; we think they shed another novel light, and perhaps an essential one: at regional scale, and above all with reference to the "extreme" social groups, the presence or absence of degradations seems to play a more important role in structuring and social differentiation than the presence or absence of amenity factors. Thus, it would seem that the repulsion caused by environmental nuisances and degradations may give us a better understanding of environmental disparities mechanisms at the scale of the Ile-de-France region than the attraction operated by certain settings, notably those we designate as natural (green spaces, waterways).

This said, how does the environment intervene concretely in household choices and strategies? Is avoidance of nuisances and pollution actually more important than the search for amenities? How do environmental experiences and satisfaction, and more generally the living environment, intervene? Do they confirm or invalidate the geography we have devised? And on the basis of what other factors, indicators and methods?

### 3.3 Towards environmental inequalities in terms of lived experience and satisfaction: the structuring role of felt environmental experience and the capacity to act at the local scale

#### 3.3.1 A population survey: presentation of the method, the thematic fields and the locations selected

Six municipalities were selected on the grounds of the regional environmental typology, ensuring that the number of questionnaires were kept at a minimum (100). We privileged the choice of municipalities of clearly differentiated environmental types (good, average, bad). While globally environmental criteria predominated, we took care to retain for each environmental category binomes of municipalities equally close socially, guaranteeing a certain internal comparability for each of the groups. But we also sought to vary the history and the dynamics proper to each of these territories, by selecting municipalities from different departments in each category.

In this case we opted for the three “first ring” (première couronne) departments of the Paris agglomeration. In 2008, these departments were home to 37 % of the regional population (11.6 million people). Together, they represent the diverse social and environmental situations encountered throughout the region: residential areas that are sometimes identical to those of the peri-urban areas of the “outer ring”; an environmental offer (e.g.: woodlands) that is to a certain extent comparable to municipalities more remote from Paris; or – as a last example – certain links with or proximity to agricultural areas. Moreover, these three “first ring” departments differ clearly as to their trajectories:

- economic (type of activities and development, for example a very different industrial past),
- social (socio-professional aspects, for example municipalities that may be situated at the extremes in terms of tax base),
- urbanistic (morphotypes, with for example very variable proportions of collective and social housing),
- and thus environmental (amenities/disamenities, with for example strong differences in terms of protected areas, or transport-related nuisances, industrial risks, etc.).

On the basis of these diverse crossed criteria we retained:

- for municipalities of good environmental quality: Sceaux (Hauts-de-Seine - 92<sup>8</sup> department) and Vincennes (Val-de-Marne - 94 department),
- for municipalities of low environmental quality: Asnières-sur-Seine (Hauts de Seine - 92) and Noisy-le-Sec (Seine-St-Denis - 93),
- for municipalities of mixed environmental quality: Choisy-Le-Roi (du Val-de-Marne - 94) and Epinay-sur-Seine (de Seine-St-Denis - 93).

The questionnaire addressed the inhabitants (average length 45 minutes), and consisted of 75 questions, 23 of which were open (verbal qualification). It was structured around our queries on the satisfaction and lived experience of the environment and established an analytic register for a different geography of environmental inequalities, notably pointing towards two major explanatory dimensions:

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<sup>8</sup> Cf. Maps 1 and 2 to localize precisely the different departments involved in the survey.

Municipalities	Asnières-sur-Seine	Noisy-le-Sec	Choisy-le-Roi	Epinay-sur-Seine	Sceaux	Vincennes
Population 2005	82 800	38 600	36 300	50 800	19 400	47 200
Gross income per inhabitant 2003	1403,16	899,58	1038,98	837,94	2136,68	1806,92
Unemployment rate 1999 (in %)	11.6	15.56	13.76	18.84	6.88	9.51
Property owners 1999 (in %)	37.86	33.26	37.90	34.91	46.75	43.84
Social housing 2005 (in %)	21.89	42.05	34.44	38.06	22.55	6.07
Presence of a Zone Urbaine Sensible	yes	yes	yes	yes	yes	no

Table 8. Socio-economic characteristics of the municipalities surveyed, Sources: RGP (1999 et 2005), DGI (2003), DGI/DGC (2006)

- the felt environment, including affective relation to place, territorial anchoring... notably via residential trajectories or sensible perceptions of the near environment;
- people's involvement and their willingness/capacity to take action at local level for example, or via their attitude towards public action, the public authorities or provisions for participation.

We must also specify that the questionnaire was established after a preliminary phase of 50 exploratory interviews conducted in the 6 selected municipalities; these enabled us to fine-tune the potential role of certain local factors, and to test the wording of some questions.

Finally, eight major thematic headings structured the questionnaire (Appendix 1 presents the overall structure of the information collected and the variables tested):

- Residential trajectory of the person and the household, length of residence (seniority) and assessment of the neighbourhood
- Motivations and criteria for the decision to live in given municipality
- Representations of the quality of the environment and of the living environment (at different scales)
- Environmental experience, perception and satisfaction levels (at local and urban scale)
- Projects of residential mobility, motivations and conditions
- Spatial practices (work, services/equipment, tourism)
- Opinions on territorial action at different scales and points of view about relations with the public authorities

These seven headings were completed by a further one establishing the major socio-economic characteristics of individuals and their households (professions and socio-professional categories, educational level, age, sex, type of housing, occupational status, length of residence - seniority - in the municipality).

As stated in the introduction to this third part, these eight headings and the whole survey as such call upon and cross contributions from several scientific disciplines:

- from cognitive psychology, notably for the parameters of satisfaction and mastery of the private character of the environment,
- to political sociology, in order to grasp the social relations to territorial action, the modalities of its construction, and the criteria that legitimize it,
- via psychology and social geography, for the analysis of the weight of representations, but also of the identity factors of attachment to the living space,
- and via spatial economy to assess the structuring role of socio-economic factors in the distinctive construction of urban areas.

We opted for a quota-based sampling method, with three criteria: distribution by professions and socio-professional categories (in French: PCS); distribution by age, and by gender. For these three criteria, the 600 persons surveyed are representative of the municipal populations. Moreover, various filtering criteria were applied (sampling objectives):

- the age of surveyed individuals: only persons aged 18 and over were selected, in order to guarantee a certain stability relative to choice and particularly to residential choice;
- a minimal length of residence (seniority): individuals with less than one year of residence in their current home were excluded from the sample, in order to ensure that they had a certain experience of the environment, the neighbourhood and the larger living environment;
- homogeneous infra-municipal distribution, in order to ensure complete coverage; to this aim, quotas were established by sector (function of the number of sectors to be surveyed and the environmental characteristics of the neighbourhood)

Appendix 2 presents an example of municipal breakdown by surveyed neighbourhood and socio-environmental characteristics.

### **3.3.2 Between environmental repulsion and attraction: the weight of sensory interpretative environmental filters for residential choices**

Firstly, 58.2% of the persons surveyed declared that they were attentive to the quality of the environment when choosing their home. This means that the environment is the 4th major criterion, behind the internal characteristics of housing and the price variable, but more important than the offer of services, shops and facilities, than the neighbors and/or nearness to family/friends, or parameters relative to the general atmosphere in the neighbourhood. This result fully complies with what numerous surveys conducted in several European regions over the past 15 years have demonstrated (see for instance Bonaiuto, Fornara, Bonnes, 2003), and confirms the argument voiced in the previous part of this chapter: the environment is increasingly important for lifestyle choices of European populations.

In a next step, an analysis of environmental factors for these criteria enabled a more precise view of what makes up the environment and its quality.

Setting aside the financial and material constraints liable to influence their choice, we see that persons are above all likely to avoid disagreeable factors (e.g.: repulsive effects of pollution, nuisances and risks). Firstly, this validates the observation made previously on the basis of standard indicators and the disparities thus observed. Here too we must note, with reference to factors of attraction, that parameters relating to the sensory atmosphere (ex: tranquility) constitute another privileged register: the presence of nature in the

neighbourhood, the view, cleanliness, architectural quality and low building density. Thus, perceptual operations, the dimensions of experience and sensibility do indeed operate as primary interpretative filters of environmental quality, at least when planning to move house. This is certainly one of the first contributions of the survey to our overall issue. We shall return to this question later.

	Number	Proportion
Housing quality	392	65.33
Price of housing or rent	381	63.50
Nearness to collective transport	377	62.3
Environmental quality	349	58.17
Presence of shops and services	307	51.17
Nearness to place of work or study	290	48.33
Image and mood of the neighbourhood	266	44.33
Building density and quality of architecture	243	40.50
Safety	204	34.00
Proximity to good schools	175	29.17
Presence of friends or family	143	23.83
Neighbours	129	21.50
Presence of sports and cultural facilities	111	18.50
Total / surveyed	600	

Table 9. Criteria privileged by households in the choice of their current home, Source : Faburel et Gueymard (2008)

	Number	Proportion
No traffic noise	297	52.2
No factories in the vicinity	280	49.2
Green spaces	270	47.5
Cleanliness	268	47.1
No air traffic noise	264	46.4
Presence of trees, vegetation in the neighbourhood	258	45.3
View	197	34.6
No rail traffic noise	192	33.7
No flooding risks	183	32.2
Quality of local architecture	164	28.8
Low building density	164	28.8
Air quality	135	23.7
Presence of waterways and bodies of water	78	13.7
Total / respondents	569	

Table 10. Environmental criteria linked to the choice of future housing, Source: Faburel et Gueymard (2008)

From the point of view of the environmental inequalities problem we address, we prolonged the analysis by crossing future criteria of residential choice with socio-

professional categories of households (PCS). The strongest attraction and repulsion between on the one hand the different social categories, and environmental objects on the other hand, were recorded using the Correspondence Factor Analysis, with the Maximum Percentage Deviation as indicator (PEM). Two response modalities (yes/no) were systematically associated with criteria that proved significant: yes designating a significant relation to choice, no to non-choice.

Profession and socio-professional category	Question	Modality	Effectifs	Khi2	PEM	Test Khi2
Craftsmen/tradesmen, shopkeepers, heads of businesses	No railway traffic noise	Yes	14	3,325	29	••
Managers and higher level intellectual jobs	No railway noise	Yes	43	4,909	19	•••
	No road traffic noise	Yes	56	1,513	17	•
	Low building density	Yes	37	4,412	15	•••
	Quality of local architecture	Yes	36	3,63	14	••
Intermediary professions	No flooding risk	No	85	2,808	45	•••
	No railway noise	No	78	1,076	26	•
	Low building density	Yes	41	6,174	18	•••
	No air traffic noise	No	65	1,087	18	
	Quality of local architecture	Yes	37	2,983	12	••
Employees	Presence of green spaces	Yes	53	2,223	19	••
	No factories in the vicinity	Yes	53	1,501	16	•
Workers	Quality of local architecture	No	68	1,188	38	••
	Cleanliness	Yes	52	6,453	34	•••
	No road traffic noise	No	55	4,46	33	•••
	No factories in the vicinity	No	52	1,563	22	•
	Presence of green spaces	Yes	43	1,008	14	
	No flooding risk	Yes	32	1,954	12	•
Retired persons	Low building density	No	128	1,697	32	•••
	Cleanliness	No	103	2,994	23	•••
	No flooding risk	Yes	65	6,117	16	•••
	No factories in the vicinity	Yes	82	1,041	10	

Table 11. Environmental objects designated as important in the choice of new housing, according to socio-professional category, Source: Faburel et Gueymard (2008)

These various relations highlight the oppositions between social categories, notably between the categories that are most emblematic of problems of inequality. Among the objects that embody these oppositions, we note that:

- Road traffic noise seems to structure a difference between the richest and the poorest. Avoidance factor for managers and upper level intellectual professions, it has no repulsive effect on workers.
- Railway traffic noise, and less importantly air traffic noise, distinguishes between the middle classes (intermediary professions) and the richest (managers).
- The quality of the local architecture (and in a lesser measure building density) distinguishes, via its attractiveness or lack of it, management and upper level intellectual professions, as well as the intermediary professions, from workers.
- Finally, the presence of a factory here differentiates employees from workers, both low income groups (PCS). In fact, since the factory is part of the worker's social universe, this result appears highly plausible.

Thus, though the "objects of opposition" generated here are not all identical to those identified previously as structuring the social composition of space at regional scale (a reminder: listed heritage sites, Seveso type industrial risk, railway traffic noise, airway traffic noise from major Paris airports), we observe:

- an a priori global correspondence between objectivized environmental quality and motivational objects,
- and above all, a strong structuring of social distribution due to repulsion, i.e. the avoidance of certain potentially disagreeable environmental factors.

It would therefore seem that negative environmental factors do indeed introduce greater spatial social distinctions than positive objects, actively contributing to selection mechanisms and consequently to the construction of the geography of environmental inequalities. However, and this is the third point, and doubtless the most important one, we must again admit that the parameters of sensory atmosphere (sight and sound) constitute an important register, an interpretative filter for the assessment of the environment - both positive and negative. Above all it distinguishes - via its statistically validated presence or absence - between the rich and the poor. For us this was a strong incentive to pursue our analysis by examining environmental satisfaction, and understanding the social factors of its construction.

### **3.3.3 On the inequalities of felt and lived experience: The primary role of local attachment, of sensible operations and of political involvement**

Several questions attempted to evaluate the environmental satisfaction of households: variables of numerical assessment on a scale from 0 to 10, addressing a list of environmental objects (positive and negative), but also open questions on what was perceived as agreeable or disagreeable (cf. Appendix 1).

Following a factorial analysis (AFC) based on the responses to these questions, we used classification methods enabling us to establish sub-populations, depending on how close their responses were to each other. This generated three sub-populations, homogeneous in size: the dissatisfied (A : 24.3%, n=146), the more or less satisfied (C : 39.8%, n=239), the very

satisfied (B: 35.8%, n=215). We then operated various crossings with the explanatory dimensions established by the body of information (corpus) generated by the survey. Numerous differences appear behind these 3 great levels of satisfaction: different residential trajectory/seniority (with as a modulating factor the degree of attachment to the municipality), different modalities and factors of residential choice (for example the choice or rejection of a home), different representations of the environment (positive/negative, local/global, bio-centred/anthropo-centred), different spatial and leisure practices (e.g.: use of green spaces), different relations to public involvement (confidence in elected representatives, membership in or cooperation with an association) and different socio-economic characteristics (for details cf. Faburel and Gueymard, 2008).

Above all, the three categories of satisfaction (and their associated socio-spatial profiles) with professions and socio-professional categories (PCS), enabled us to note the existence of environmental inequalities of the lived environmental experience. First of all, there are indeed notable social differences of the felt experience depending on socio-professional category. A priori, the most affluent social categories are proportionally much more satisfied with their environment than the poorest categories, and this within the same municipality. It appears that the socially most vulnerable are proportionally the most dissatisfied.

	<b>Dissatisfied</b>	<b>Moore or less satisfied</b>	<b>Very satisfied</b>
Craftsmen/tradesmen, shopkeepers, heads of businesses	25.9	33.3	40.7
Managers and upper-level intellectual jobs	14.6	44.8	40,6
Intermediary professions	20.6	47.1	32.4
Employees	33.3	40.6	26.0
Workers	48.8	32.9	18.3
Retired persons	15.9	36.3	47.8
Other persons with no professional activity	17.5	40.0	42.5

Table 12. Level of environmental satisfaction by socio-professional category, Source: Faburel et Gueymard (2008)

However, beyond generally confirming the overall link between environmental satisfaction and the usual social indicators, certain results generated by the measure of satisfaction directly question the conventional measure of environmental inequalities (i.e. mainly technical physico-chemical approaches aiming for normative action for protection). If a priori the most vulnerable socially are proportionally the most likely to be dissatisfied with their environment, some questions still have to answered. Notably, the distribution among the different satisfaction levels of professions and socio-professional categories highlights a large diversity of situations, with strongly contrasting felt experiences which did not allow us to establish a clear (unequivocal) relation to the environment by social category. In other words, satisfaction may vary strongly at an identical social level and at a comparable educational level. At municipal and infra-municipal scale, and again going out from the 3 different categories of environmental quality:

- 45.6 % of very satisfied individuals do not live in a municipality designated as having very good environmental quality,

- 41.2% of persons living in municipalities of good environmental quality appear to be not fully satisfied with their environment, and 6% are totally dissatisfied.

These fine distinctions put the explanatory scope of “objective” environmental satisfaction characteristics into a more relative perspective, and queried the instruments used to measure environmental inequalities.

Continuing the analysis of the different explanatory dimensions of environmental satisfaction, we finally attempted to establish a hierarchy of the variables which, by crossing all the explanatory dimensions arising from the questionnaire’s thematic headings (particularly the relation to the living environment and the ways of life), appear to structure and discriminate between the different groups most strongly. Again using the Maximum Percentage Deviation (PEM), we then established a decreasing classification of the variables most strongly associated with the environmental satisfaction of the persons surveyed.

Variable	Deviation	Khi2	Test Khi2	PEM
Expectations as to improvement of environmental quality	19	14	•••	42
Feeling of being "at home"	80	63	•••	40
Regret at having to move	78	36	•••	35
Confidence in the municipal elected representatives	106	73	•••	35
Regret at having to leave the neighbourhood	87	82	•••	32
Criteria of residential choice: environmental quality	80	32	•••	32
Municipality of residence	101	72	•••	30
Living in a ZUS classified neighbourhood	20	18	•••	30
Reference to ideal living environment: here	42	18	•••	30
Municipal environmental characteristics (3 categories characterized “objectively”, see above)	96	46	•••	29
Attachment	75	44	•••	29
Membership in association	45	12	•••	27
Confidence in local public authorities	61	41	•••	27
Frequency of use of green spaces	62	38	•••	26
Criteria relative to residential choice: the image and atmosphere of the neighbourhood	39	10	•••	25

Table 13. Classification of explanatory variables of environmental satisfaction (global PEM), Source : Faburel et Gueymard (2008)

Once again, environmental satisfaction seems to imply objective environmental endowment, here expressed by the variables “municipality of residence” and “municipal environmental

characteristics”, and we note a certain correspondence between such endowment and its lived experience; once again, declared satisfaction appears to be socially anchored; nonetheless this classification casts a few interesting lights, above all putting the weight of strictly socio-economic criteria into a more relative perspective, and generating other, potentially more promising types of determinants within detailed local situations.

1. As a matter of fact, it appears that environmental satisfaction is above all strongly linked to the emotional identity-related aspects that accompany a living environment – including so-called low-quality environments: to regret moving from the house and the neighbourhood, the chosen environment, the current place of residence considered as the ideal living environment, the strength of the attachment to it. All these elements are expressed above all in terms of being “at home”.
2. In this register of lifestyles, sensory parameters that qualify the surrounding atmosphere and the perceptual operations and dimensions of experience are the primary filters to interpret environmental quality and the resulting satisfaction or dissatisfaction (frequency of using green spaces, criteria of atmosphere in the residential choice).
3. Finally and above all, this satisfaction seems to depend on the confidence of the persons in collective means of action and particularly in the elected local representatives, and their capacity to respond to expectations relative to environmental matters and the living environment. While association-based involvement, and in consequence the evaluation of provisions for public participation, seem to express a commitment that seemingly unfolds in a more political dimension relative to environmental satisfaction and social inequalities as they are experienced, it also appears to ground it.

Thus, it appears that environmental satisfaction depends less directly on socio-economic variables, or on “objective” environmental characteristics, than on the differentiated capacities and aptitudes of persons (who are, let us remember, socially unequal, cf. 2nd part) to control their local environment and act upon it, thus confirming a number of relevant findings from cognitive psychology and political sociology.

Once crossed, these three types of results make apparent the strength of affective mechanisms and political involvement to influence the relation to the environment. They also point towards the growing weight, running across all social categories, embodied at the local scale by the “universe of what is near”, in the assessment of the environment and the desired changes (cf. 2<sup>nd</sup> part).

#### **4. Some practical indications for evaluation and implementation, with a view to the sustainable development of European regions: From socio-spatial disparities to territorialized environmental injustices**

The research summarized here confronted statistical data on so-called environmental inequalities on the scale of the Ile-de-France region with the environmental experience of the region’s inhabitants. The research aimed to build a different geography of environmental inequalities, taking into account the lived and felt environment, through local experiences, satisfaction, and place attachment relative to the environment. A further aim was to improve the understanding of the operative mechanisms, notably residential ones, in the phenomena of spatial polarization for environmental reasons at regional scale. Our two working hypotheses were:

- the register of personal lived experiences and of environmental satisfaction constitutes a non-negligible source of information which, due to its territoriality and resulting transversality, distinguishes between environmental qualities, thus pinpointing disparities, inequalities and even injustices in this area;
- the subject-individual, via his lived environmental experience and the cognitive and social transactions he operates, constitutes together with his immediate living environment, a pertinent scale of observation to highlight certain relevant determining dynamic factors of inequalities, in order to perhaps differently ground territorial decision making.

The first stage was based on crossing two typologies, one environmental, the other social, going out from previously existing statistical data. This led – classically – to the observation of a growing correlation between the environmental and social characteristics in the Ile-de-France. This distribution confirms the situation of certain areas in the nearer suburbs, which used to be industrial, but also that of peri-urban areas absorbing the dispersion of low-income populations to areas which may have been subject to recent deterioration (e.g. certain parts of the eastern Seine-et-Marne). Above all, as of this stage, it became clear that it would be easier to understand residential choices and the resulting geography, more via the repulsive effects of environmental damage and deterioration than via the attractiveness of certain elements, notably those called natural here (green spaces, waterways). It also generated a list of environmental objects and factors that make a place attractive or undesirable.

The second step was to select six municipalities close to Paris considered as representative of the different environmental disparity situations identified. A survey based on a semi-open questionnaire was conducted with 600 inhabitants, face to face (average length 45 minutes), to gather information concerning the environmental experiences and satisfactions of the households concerned, their real life situations and perceptions of environmental quality and of their living environment, their residential itineraries and attachments, places, practices, and relations to public action. The survey confirmed our argument that people are more likely to make their residential choices to avoid nuisance factors; with traffic noise or the bad quality of local architecture (and to a lesser extent, the presence of an industrial sites) as the major arguments. It also showed that environmental satisfaction is probably strongly linked to territorialized experiences and expectations relative to the lived and felt environment: the capacity of the near environment to provide a feeling of “*being at home*”, and confidence that elected representatives (above all municipal) will do something about these expectations.

These results elucidate the strengths and weaknesses of the conventional approach to environmental inequalities, founded (if we remember) on a static reading of quantified physico-chemical (e.g.: exposures) and socio-economic facts (e.g.: income level). The situations described are situated at least as much in the domain of sensible, symbolic and axiological relations and transactions of local societies to their living environment, as in the more conventional domain of the physical or social components of local places, which are often largely accounted for: thresholds of chemical exposure for air quality (with, for instance, short interest in health effects) ; data probabilities of risks occurrence, flood risks and hazards for instance (with, for example, no more interest in local history, social habits or economical activities linked to rivers); acoustic levels for noise nuisance (with well-known

gaps between doses and annoyance); distance for the accessibility of urban amenities, of green spaces...

To this aim, considering the logic of decision makers and the cultures in the urban field, we now wish to propose a few approaches that would improve the inclusion of environmental inequalities from the perspective of sustainable development (Faburel, 2011). One way would be to focus on lifestyles and people's experiences linked to the environment, and their attachment to a particular place. Another way should adopt a participatory rather than a structural approach to the investigation of exclusion and capacity forms of involvement (i.e. Sen's *capabilities*) instead of more conventional behavioural markers of urban inequality (such as moving house, for example). How can this be done? First empirically, then politically.

Certainly one must be careful when generalizing these results. There is no way in which a local survey of 600 persons could be representative of a population of over 4 million (3 "first ring" departments), and even less of the 11.6 million inhabitants of the Ile-de-France region. As the objective of our study was exploratory, it became imperative to structure spatial scales to account for the role of ecological dynamics and social transitions in shaping environmental challenges and their differential impact within society (for this see for instance Marcotullio and McGranahan, 2007, or World Bank, 2007). Moreover, we must admit that certain standard indicators have undeniable predictive power, for example when evaluating the increasingly significant weight of so-called environmental disqualifications on the repulsive effect of certain environmental situations, e.g. in the residential choices of households.

But, as for the less static and descriptive, more dynamic and "pro-active" interpretation of our approach, it addresses both the production of scientific knowledge and its usual divisions/habits by scientific discipline, as well as the still dominant worldwide system of environmental evaluation, i.e. mainly technical approaches aiming for normative and strictly protective action, usually at project, national or continental levels (*Environmental Impact Assessment, Strategic Environmental Assessment...*). Following in the steps of Krieg et Faber on the subject of environmental inequalities, who proposed some interesting views on the cumulative indicators of social vulnerability inspired by the *capabilities* of Sen and on environmental hazards (2004), and in the wake of Bonaiuto et al. (2003) on the importance of place attachment in households' residential choices, let us cite two examples taken from our work.

Like others, we have stated that the registers of perceptions, of the sensible, and of involvement were a powerful force structuring the lived environmental experience, to the extent that in adapting to great environmental disparities (and to an environment of so-called bad quality), the resulting appropriation ("to make it one's own") may play an essential role. Here appropriation implies mechanisms which in certain cases could easily be defined by already existing classical indicators, or as readily grasped via certain adjustments. For the first, the length of residence (seniority), which is often included in surveys on social issues (for instance housing and environment surveys) may reveal the attachment to the place of residence and a grounding in it; given the confidence granted to territorial players (confirmed by numerous official barometers) this generates means of action seen as addressing environmental problems and allowing for an assessment of the level of personal involvement. For the second, the variable "presence of a garden or terrace", for example, constitutes a true environmental relay for certain people, whereas for others it

acts as a compensatory factor within the domestic sphere. This may be more important than the distinction by type of housing (house/apartment) or by status (owner/tenant/rent-free) which surveys habitually use to distinguish socially between populations and/or to typify relations to the environment.

Similarly and perhaps even more central to the issue of environmental inequalities, or at least to the various aspects addressed in the 2<sup>nd</sup> part, a gap revealed in the survey enabled us to query the pertinence of the official statistical classifications generally proposed or used. The analysis shows that the rich are not systematically the most satisfied with their environment. Our results allowed us to cast a light on a social category which is often ignored in socio-economic approaches to the environment: non-working persons (retired persons of all social origins and others not gainfully employed). In fact, the differentiation relative to environmental satisfaction may have less to do with differences between professions and socio-professional categories (PCS), or between managers and workers, for example, than with the opposition between non-working/working persons, with the retired dominant in the first group, and workers in the active population. We will have to understand how time set free by retirement, or links between age and local attachment, may generate possibilities of involvement in environmental issues and challenges.

As we can see, information on the living environment, through local experiences, satisfaction, place attachment relative to the environment enabled us - under the condition of using complementary indicators - to obtain additional elements for a finer assessment of local disparities (neighbourhood, municipality, inter-municipality). The type and nature of environmental objects in these contexts, the importance of certain morphological and socio-economic factors, as well as the environmental perceptions and beliefs that underlie relations with local policies also provide a basis for action addressing environmental inequalities in a sustainable development perspective.

The information arising from the population's *on site* felt experience raises queries that are pertinent to an empirical measure of environmental inequalities (e.g.: what observation indicators) and for analytic frameworks (e.g.: what conceptions of the environment, of justice, of the individual, should be privileged). To a large extent, these questions still have to be resolved. In a wider sense, it addresses the systems of knowledge of the environment and their capacity to perceive what makes people "inhabit" a given place, their sensible lived experience, attachments, involvement, and thus the types of inequalities in this field.

It is true that, as stated by Charles: "*Although the environment is recognized as an object of universal concern, concrete measures relative to it, its consideration at a finer scale and the subjective dimensions that constitute it are largely underestimated and ill perceived.*" (2001, p. 21). In fact, although it has shown itself to be effective to a certain extent (see predictive power above), the environment is still viewed in terms of overlapping technical and legal norms, which do not disclose the ways in which it is "lived", nor its interfaces with other territorial characteristics. The instruments to measure these aspects are still inadequate.

Last but not least, via this cosmopolitical approach to the environment and the socio-spatial changes that accompany it, we move away from the dominant approach to both inequalities, the environment and justice, i.e. from a strictly egalitarian reading of social disparities in terms of the environmental endowment of places, and towards a more dynamic analysis of inequalities, which are (as already stated) "*the result of unequal access to the diverse resources*

*offered by a society*”, and thus to apprehend by means of a survey and qualify the territorialized phenomenon they constitute via lived experience.

In so doing, we move from only “combining” environmental degradation and socio-historical spatial disqualification (disparities) to what we see as a first evaluation of injustices through the different ways in which the inequalities thus evaluated make their entry into politics. Doubtless, as we have shown, because of the vital queries addressing the inaptitude of the current and official environmental assessment system to describe a fully territorialized phenomenon, i.e. the shortage or inadequacy of evaluation tools. But also because the factors and mechanisms used in in our work refer directly to action and its recent changes and trends via the symbolic and axiological dimensions thus highlighted.

For instance, in this new geography the structuring role of the repulsive nature of certain damages is particularly linked to the installation of so-called high-impact equipment (industrial sites, transportation infrastructures...). Let us assume that attractiveness founded on exceptional elements (sites and monuments, green components) perhaps less explains the inequalities that have been pointed out than the repulsive effect of certain degradations. Are not then public and private policies responsible for the installation of this equipment and above all for monitoring compliance with the relevant environmental standards? Are they not directly implicated, owing to their history, notably that of the State with its enterprises and services? This makes clear the impact of past arbitration, and the responsibility of public and private authorities, with their underlying conceptions of social and spatial justice, for these decisions.

Along the same lines, the influence on environmental satisfaction arising from differentiated judgments, expectations and capacities for commitment to local action, could involve inhabitants in novel ways, both via their own experience of unequal environmental situations, via forms of involvement which such situations increasingly generate, or as vital resources for participatory projects in local forms of action. In short, environmental satisfaction also addresses new forms of institutional and territorial governance of projects, and their regulation.

In fact, municipal collective bodies are confronted and must often manage growing spatial inequalities which mix socio-urban and economic stakes with increasingly environmental ones (concentration of economic activities, the social specialization of space, social disqualification and environmental degradation). Thus, today they must take a greater interest in instruments of evaluation and intervention to counter the mechanisms of socio-spatial segregation and reverse the lot assigned to certain portions of the territory which cumulate economic and social problems and environmental handicaps.

All this reinforces the idea that environmental injustice might well represent, over and above merely social disparities relative to exposure, *“the social and territorial inequalities of capacities and means given to populations and local public authorities to act in view of improving their lived and felt environment”* (Faburel, 2008). We are close here to the readings proposed by Schlosberg (2004) or Jamieson (2007): environmental justice needs to address not only the distribution of environmental harms and benefits, but also people’s participation in decision-making processes, including recognition of people’s particular identities and visions of a desirable life. This is also an extension of the interpretation of inequalities given by Mitchell and Walker (2003), and born of the *Environmental Justice* movement in the

English speaking countries: *“Unequal capacities to act upon the environment and address public authorities in order to change the living environment”*.

Such an extension would in fact mark the appearance of an updated conception of the environment (and of justice), accounting for the importance it assumes for our social cognition, practices and projections. As shown in the first part of our chapter this qualification is better adapted to the changes that the environment now imposes upon our societies, and might offer a more perceptive view of action, particularly in the urban regions where socio-spatial dynamics and segregation mechanisms are particularly strong and go back a long time.

Without this growing awareness one may well wager that the question « Evaluate, but for what purpose? » remains unanswered. For example, without fine-tuning the noted disparities highlighted by the first stage of our study (according to which 2 750 000 persons in the Île-de-France are victims of such situations), the costs of public and private intervention will act as an obstacle to action for a long time. As we see, the increasingly frequent current efforts to define and observe environmental inequalities are not able to counteract the objectives of targeted action in multi-player systems, nor their underlying conceptions of the environment (and of justice).

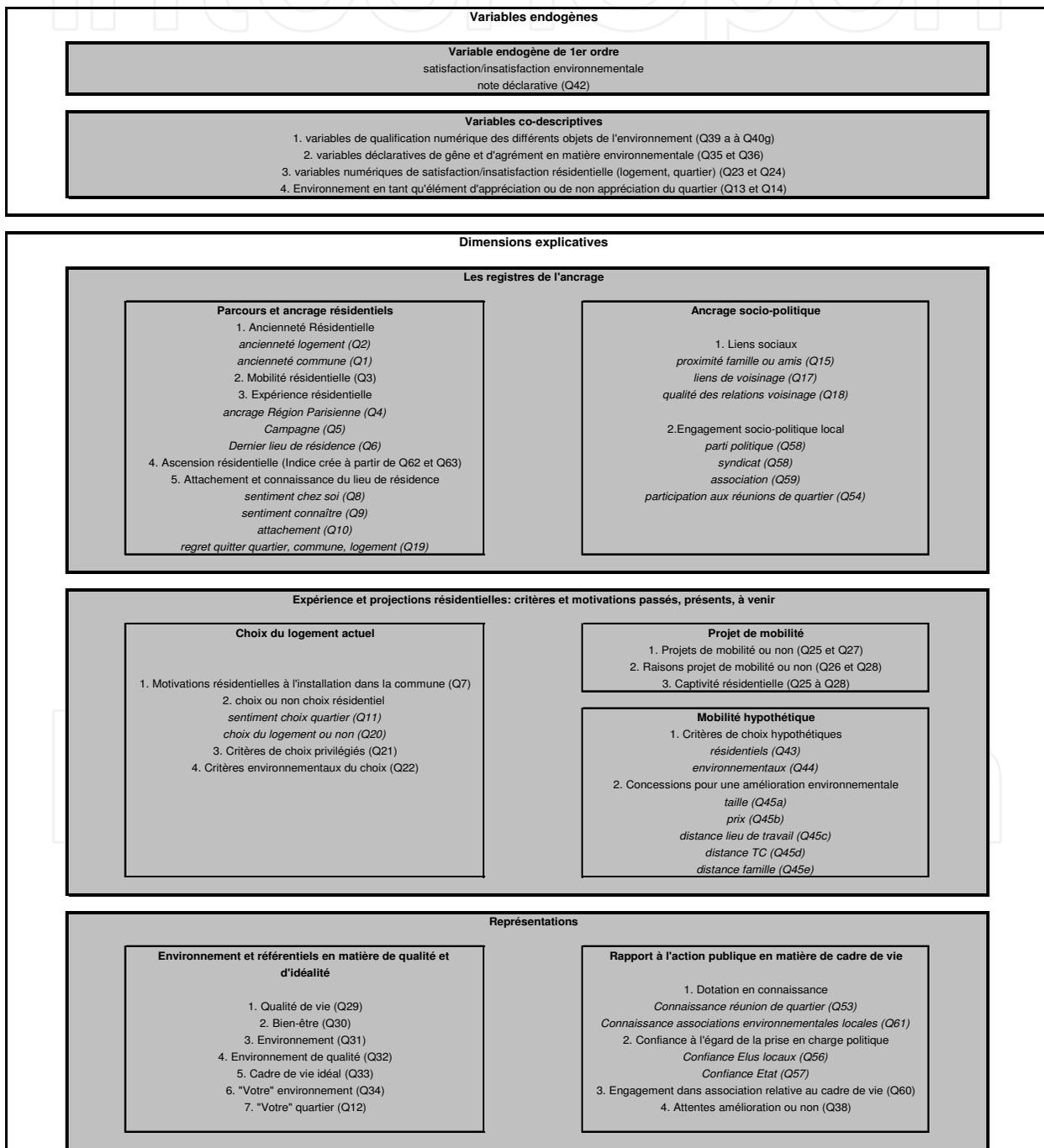
Here is where this more pro-active qualification sheds a light on potential levers for sustainable development for European regions, balancing between institutional and bottom up approaches to sustainability. However, this is perhaps less a question of sustainable development consisting of themes and pillars side by side, than of increasingly inclusive and plural, mixed dimensions, i.e. of a *“conceptual framework within which the territorial, temporal, and personal aspects of development can be openly discussed”*. These would include ‘Place’, ‘Permanence’, and ‘Persons’ (Seghezzeo, 2009). In an intersecting perspective combining different sciences and policies (Stengers, 1997), cross-disciplinary research should contribute to defining integrated, locally based issues relative to social and spatial aspects.

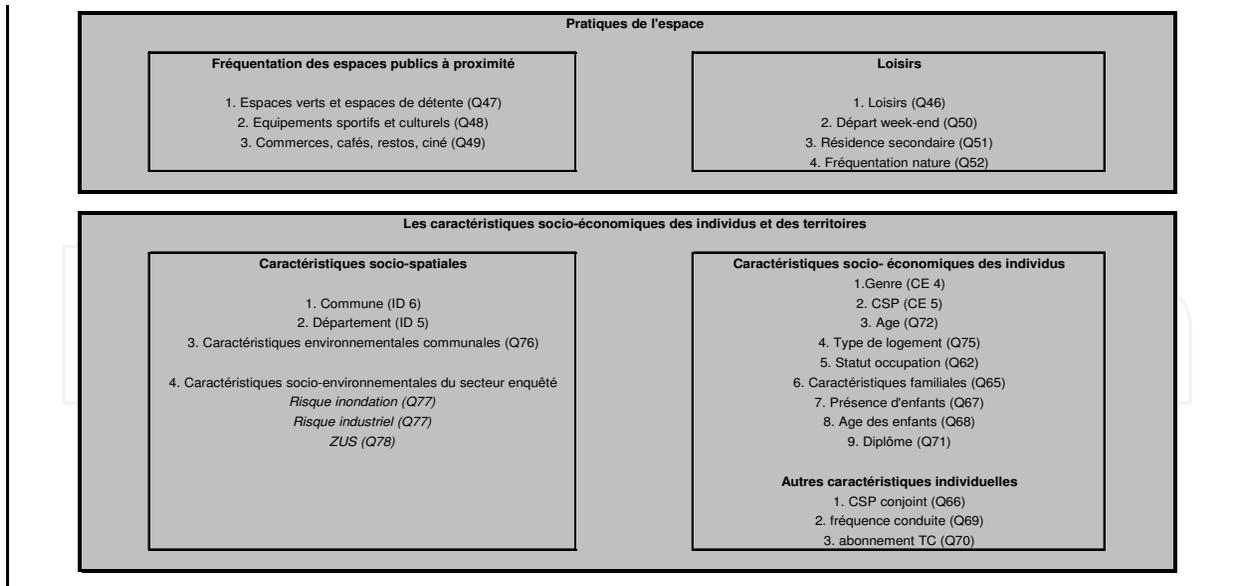
These could be used by decision makers in the field of environmental justice: experimental knowledge (for instance landscaping experiments), real participatory approaches (ex: diversity of collaborative initiatives with inhabitants and their empowerment, see for instance Cruikshank, 1999), and new subjects (well-being, sustainable/eco neighbourhoods, ecological housing). Let us also note as a last example in this perspective, that health progressively imposes itself as a paramount subject in the analysis of environmental injustice. Far from its purely biomedical and quantitative (epidemiological) aspects, this approach is evolving rapidly to view health primarily as well-being in the larger sense (e.g. emotional dimensions). Crossing it with ecological findings (Corvalan et al, 2005), it thus emphasizes its fundamental and qualitative links with poverty, participation, or the sustainability of territories (Sen, 2002).

In fact, if within the framework of the territorialization of urban action via sustainable development, as well as within that of a democracy willing itself to be more participatory (notably owing to environmental stakes, see for instance Dietz and al., 2008), poorer populations are not given the capacity of involvement, notably to make a political issue of environmental inequalities (cf. sanitary whistle blowers), certain well-known socio-economic mechanisms and the non-environmental character of dominant conceptions of social justice will continue to segregate populations and spaces, notably due to residential mobility, competitive policies, property or finance based reasons behind the installation of equipment generating negative external effects.

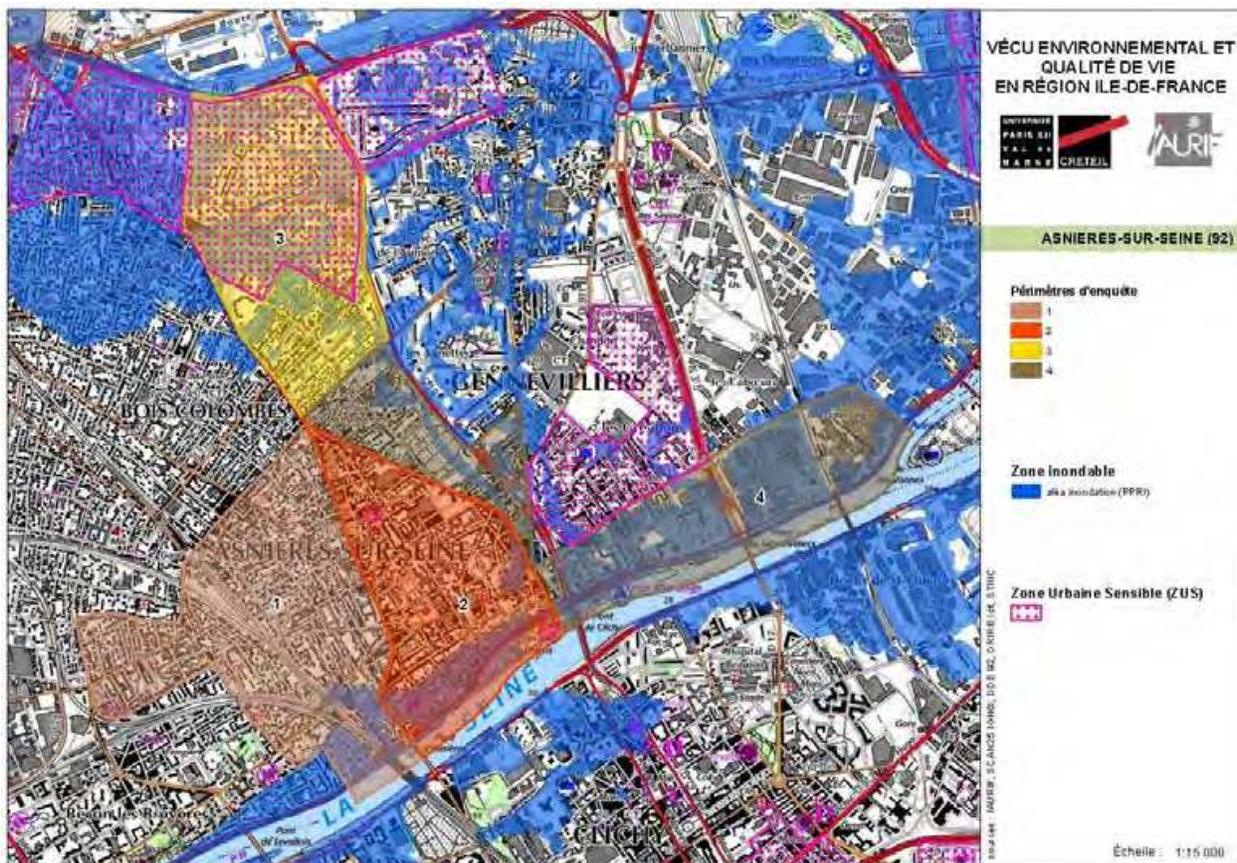
In consequence, the sustainable city should take a real interest in the long-term dynamics, past and future, of the environmental marginalization of certain of its places and populations, and protect them: against spatial fragmentation, social segregation, environmental gentrification. In any case this could prove more useful than uniquely institutional answers which have in the end doubled environmentally based social vulnerability; imposing limits on action in favor of mixity in housing policies, and enhancing the weight of the market in the attractiveness competition between various places or regions...

## 5. Appendix 1





## 6. Appendix 2



The lived environment and quality of life in the Ile-de-France (Paris) region

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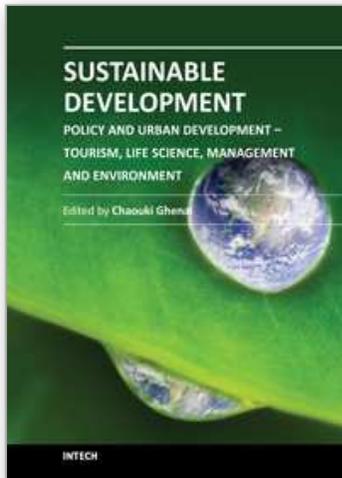
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The technological advancement of our civilization has created a consumer society expanding faster than the planet's resources allow, with our resource and energy needs rising exponentially in the past century. Securing the future of the human race will require an improved understanding of the environment as well as of technological solutions, mindsets and behaviors in line with modes of development that the ecosphere of our planet can support. Sustainable development offers an approach that would be practical to fuse with the managerial strategies and assessment tools for policy and decision makers at the regional planning level.

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