

ADVANTAGES AND LIMITS OF A TERRITORIAL AIR POLLUTION MANAGEMENT APPROACH

Roussel Isabelle

Vice-President of APPA- Professor in Lille University isaroussel69@aol.com

ABSTRACT:

Air pollution management has always been wavered between time means (norms, alerts) and spatial ones (all forms of urban zoning). European Union, have encouraged norms creating for developing air quality management by standart levels respect . This approach encourages the mediatization of such events as pollution peaks. This policy is in opposition with the recent epidemiologic studies which confirme the relationship between air pollution and human pathologies. But this relationship show no level under which the inocuity is total. On other hand, the social epidemiology, practiced in anglo saxons countries emphasizes on social phenomens weight among personnal exposure determinants. The housing feature is strong because the inhabitants spend more than 80% of the day indoor. It will be necessary to specify the notion of vulnerable people as regard as the individual sensibility about air pollution. The relationship between damaged environment, low land value and slow social condition is not systematic and have to be saved from all detriminism. Contrary examples are not unusual.

INTRODUCTION:

The European Union has developed limit values and alert thresholds based norms for monitoring air quality. This results in intense media coverage for events such as high pollution levels and peaks. The social epidemiology practised in Anglo-Saxon countries emphasizes the weight of social phenomena in personal exposure determinants. Housing has a particularly strong influence, as people spend more than 80% of their time indoors. But it also is necessary to specify the notions of vulnerable persons and individual sensitivity to air pollution.

City administrations in developed countries are preoccupied with distressed areas, which are increasingly stigmatized for combining multiple handicaps. It is a common attitude to consider personal vulnerability as a result of living in such deprived areas, characterized, from the point of view of air pollution, as "hot spots". In fact, such an assimilation is too short and ignores individual differences, which our presentation would like to stress. On the other side, hot spots identification raises questions as time variations of air pollution are greater than spatial ones. Furthermore, air pollution is only one feature of the disadvantages related to an area, which also have to do with social, economic and cultural features. As always with environmental questions, the contribution of air quality to social imprinting is made more complex by the different scales of analysis. Global pollution reinforces inequalities as it widens the distance between polluters and polluted.

Air pollution management is concerned with two different management tendencies, one based upon time criterions (norms and alerts) and the other upon spatial criterions (different types of zoning). These types of management are supported by general tools at a time when a social demand for a more personalized evaluation and prevention is emerging (at least in France). Today, people in charge are confronted to these complementary requests.

I AIR QUALITY TIME MANAGEMENT LIMITS AND THE RISE OF TERRITORIAL APPROACHES

The European Union has developed monitoring air quality norms based on limit values and alert thresholds with the idea that air quality management should depend upon thresholds values not to be exceeded. Such an approach results in a wide media coverage of high pollution events and peaks. But recent epidemiological studies confirming the relationship between different pathologies and air pollution have also demonstrated that these relationships have no threshold, there is no level under which the exposition to air pollutants can be considered as safe in terms of health impact.

The industrial alert concept has, in fact, proven a certain efficiency, but now alerts related to secondary pollutants derived from car emissions show poor results. [1]The strong media coverage induced by alerts has a pedagogical value; peaks keep car drivers aware of air pollution damages and risks. But at the same time, paradoxically, media coverage has no effect on peaks themselves but only allows a better acceptability of long term measures. The summer 2003 hot wave has been particularly significant in that respect with many ozon alerts, set off with a real technicity. But very limited actions were possible in face of the heat and the meteorological conditions that produced it.

The administrative and legal background (particularly strong in France) tends to valorize territorial management and planning. Considering air matter and its volatility, it may seem paradoxical to refer to space as a management tool. In fact, surface water is set into intertwined but limited catchment basins, circumscribed by a delimited perimeter. Air management has to integrate different scales from indoor spaces to the planet atmosphere as a whole. Spatial management of such a natural element has to move through different scales taking into account human health in a non exclusive way because health of future generations will depend upon the planet state, possibly understood in terms of planet health. A spatial approach stands as a new regulation tool between local and global scales. Spatial planning or rather spatial precaution has become a major element of air quality management through a better control of industrial plants and road infrastructure sanitary impacts and, consequently of transport. Avoidance strategies or plants and housing mixing raise questions for local policies which have to integrate spatial dimensions and risks management. But planning may also reduce energy consumption through better transport organization. Interactions between urban sprawl and transports have been studied by M.Wiel [2]

Industrial pollution has noticeably decreased, but under certain particular meteorological conditions, smoke dispersion can be very weak. It's better avoiding settlements downwind plumes, in directions identified by pollution roses. Fig n° 1 shows the preferential direction taken by sulphur dioxide in two monitoring stations of Nord-Pas-de-Calais region coal basin. These results have to be taken into account in territory planning when new housing has to be built.

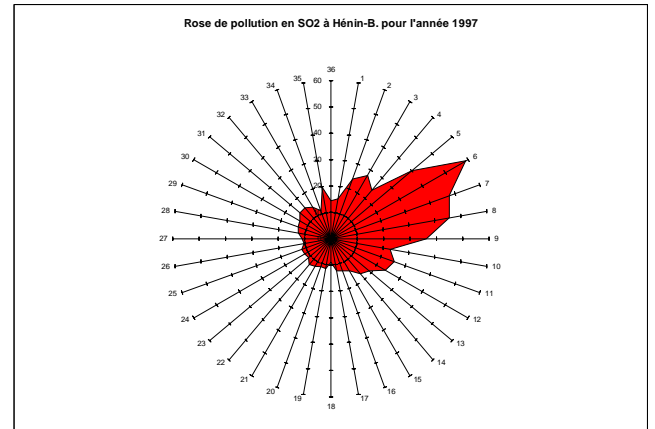
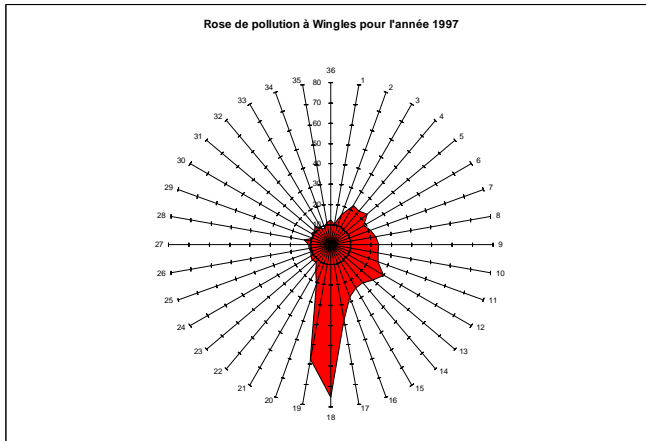


Fig. n°1 Pollution roses in 1997, showing preferential direction SO₂ emissions in two monitoring stations in North/Pas-de-Calais region. Wingles station (on the left hand) is located northward from the plant and Henin Carvin station is located westward (source Aremartois)

Rational territory planning allows not only to hold down the negative effects of pollutants but also to limit emissions through the reduction of motorized traffic. All planning work in the fringes of metropolitan areas is developing according to such views today¹.

The spatialization of air pollution management has the advantage of offering answers in close connection to emissions problems, bringing some obvious keys for prevention. But it also presents numerous disadvantages.

II AIR QUALITY SPATIAL MANAGEMENT LIMITS

Norm based management can only be completed through a spatial approach and the eradication of hot spots. This points out to technical and social difficulties.

Spatial management's technical difficulties : air pollution spatialization isn't easy, and cannot be achieved through sophisticated modelling only. In fact, a spatial function isn't sufficient to interpolate pollution levels measured at two different points. It is necessary to integrate the possible occurrence of additional sources. The uncertainty of the model may be as high as the variables themselves. The results have to be treated with the more precaution as time variations of pollution levels are often of a higher magnitude than spatial variations because of the variability of meteorological situations. "Hot spots" identification is closely connected with the reliability of emissions measurements. Spatial management is difficult with wide scale or global pollutions, as emission areas are not eventually the most polluted ones. The suburban inhabitants affected by high ozon levels are only partly responsible for urban plume constitution [3]

Spatial management's social difficulties: « hot spots » identification can contribute to amplify a territory's negative image, even cause its stigmatization, which characterizes certain distressed metropolitan areas. Yet, air pollution is only one of the disadvantages of an area, also made up with social, economic and cultural features. If handicaps are often cumulative, this is not systematic. In the former North/Pas-de-Calais coal mining basin, the resignation of disadvantaged populations can induce them in being exposed to new environmental problems. The well to do inhabitants of Lille metropolitan area, living in the new town of Villeneuve d'Ascq, have given themselves the means to refuse having a new

¹ IAURIF 2003 Franges des métropoles n°136

waste incinerator built in their neighbourhood. Its location has been more readily accepted in a former industrial area hit by desindustrialization.

The assimilation of air pollution to an unfavoured area image can be explained by the global character of the notion of quality of life. The temptation is strong to consider any disadvantaged area to be highly polluted same as an insanitary lodging is often confused with a polluted flat. The gap between pollution “objectively” measured and pollution perceived by the inhabitants is an important stake for public policies. It’s difficult to prescribe rules if there is no conscience of the problem. On the contrary, certain questions, considered as “subjective”, are neglected by policy makers. For example, the question of smells can be viewed in two ways. On one hand, the problem may be neglected because a bad smell is not a sign of health hazard. A small quantity of a product can emit a very strong smell, yet far from toxic values. On the other hand, the discomfort induced may be considered a sign of bad quality of life and termed as important a question as a hazard problem. Is comfort as important as risk? The choice is political.

Territorial management brings together all the difficulties related with competences intertwining and the intrication of administrative areas. At the time of French decentralization, subsidiarity is still on the learning and responsibilities sharing between the different territorial levels is far from being established. Monitoring networking, trusted to specific associations called AASQA (Associations agréées de surveillance de la qualité de l’air, Approved associations for air quality monitoring) on a regional basis has built itself up as an organization where a lot of ideas concerning a better repartition of the different missions at the different levels, European, national, regional and local are brought forward and discussed [4] .

III TOWARDS AN INDIVIDUAL PREVENTION

Atmospheric pollution is basically a public health concern, but the individual’s point of view is getting more and more impact and recognition.

The influence of air pollution on territorial imprinting must be relativized because it is only one element of the quality of life, and also because individual exposure cuts short the steadiness of environmental pollution levels. Spatial assessment of urban pollution must be crossed with urban mobility and the influence of indoor pollution, through the very volatile notion of “lived territory”. If they are more representative of the real impact of air pollution, air pollution investigations in terms of personal exposure are much more difficult to map and associate to a precise territory : in a city, very few people spend the whole day in the same place; mobility, which characterizes the city, by definition a place of exchange, relativizes territorial images. Urban policies have come up to this and disclosing unfavoured areas through an adequate transport policy is one of the solutions used by urbanists to struggle against social exclusion.

Air quality is not a basic criterion for choosing a house. Looking at the pollution maps drawn by the Paris monitoring network Airparif, it is surprising to discover that the more polluted areas (the central part of the agglomeration) are high prices and high taxes areas. Housing values of town centers are increasing. Paradoxically, investments in public transportations make inequalities between town centers and suburbs grow. The actual trend in public transportation increase and car traffic decrease in town centers make centers more quiet and improve center accessibility and attractivity. Traffic jam are set back in the suburbs. The territorial negative image has to be relativized by the volatility of the notion of territory. The territory is no longer a fixed piece of space. It is far more fluid because life is not only space

but motion. From an inhabitant point of view, atmospheric pollution is not a matter of space but of person, wherefrom the notion of personal exposure, now a main topic. The knowledge about personal exposure aims at individual investigation and understanding of environmental behaviour and health, an emerging concern. Another aim consists in drawing lessons about necessary changes in society.

Lessons from personal exposure determinants: The investigations developed, for example, in the “air sentinels” study [5, 6] have brought forward the part played by housing in exposure. In fact, transport has a strong impact on emissions, but as far as exposure is concerned, time spent in transport is less than an hour everyday when the time spent indoor amounts to 90% of the overall time. At home, prevention raises questions about central heating, opening windows, garage communications with the house, etc...

Social epidemiology, increasingly developing in anglo-saxons countries, stresses the weight of social features in health. A right prevention would have to reconsider the notion of sensitive people. Besides the inequalities between different parts of agglomerations, inequalities between inhabitants are still important. What is a sensitive person as mentioned by E.C.? Summer 2003 hot wave induces to reconsider the notion of vulnerability. Studies have not been completed yet, especially concerning ozon impacts. The figures in table 1 give overall evaluations [7]. What appears for certain is that the excess of mortality is not uniform. Death has affected not only very old people but people over 45. Paris was particularly hit and the countryside spared. Children mortality has not been altered by the hot wave. A few decades ago, children were threatened by heat because refrigerators were not as numerous as now, and milk was not safe any longer. Mortality rate in 2003 is higher than the previous years, at 9.1, which equals the 1998 figure, when in 2002 it had fallen to 8.9. The increase is 3%, when children mortality has remained constant around 4.2

		0-44 ans	45-74 ans	75 ans et plus
commune rurale		1,1	1,2	1,5
U.U. de moins de 5000 inhab		0,8	1,3	1,7
U.U. 10 000 à 19 999		1	1,2	1,6
20 000 à 49 999		1	1,3	1,6
50 000 à 99 999		1,3	1,2	1,6
100 000 à 199 999		1,1	1,2	1,6
200 000 à 1 999 999		1	1,2	1,6
Paris		1,2	1,8	3

Table n°1: Relationship between the number of observed deaths and the number of deaths expected between august the 1st and august the 20th, in relation to agglomerations (U.U.: Urban unit) size. (INSERM source)

CONCLUSION

The different managements of atmospheric pollution we have reviewed are not exclusive the ones from the others. The alert stimulates public opinion and makes it keep in mind the pollution problem even if nothing is done while pollution remains at peak levels. On the opposite, different forms of urban management offer long term benefits. Besides collective prevention, a more personal prevention is emerging. Well to do people living in a large flat in a polluted area will bear atmospheric peaks better than an old person living alone in an old flat under the roofs. Atmospheric pollution, as part of the quality of life, is a sign of inequality. The high value of town centers is raised by the efforts to improve public transport. The environment should be an incentive to reduce inequalities and not to create new ones. But

the policies to lead are subtle and produce many counter-intuitive or perverse effects so that results may be very different from what was expected.

BIBLIOGRAPHY

- [4] CHARLES L., ROUSSEL I. 2004 Peut-on parler d'une gouvernance de la qualité de l'air ? (à paraître aux éditions de l'Aube)
- [1] DAB W., ROUSSEL I., 2001, *L'air et la ville* Paris, Hachette, 219 p.
- [7] INSERM 2003 Estimation de la surmortalité et principales caractéristiques épidémiologiques rapport remis au Ministre de la Santé, de la famille et des personnes handicapées le 25 septembre 2003
- [3] ROUSSEL (I.), FRERE (S.), MENERAULT (Ph), 2001, « L'ozone des villes et l'ozone des champs. Ou les relations ambiguës entre pollution atmosphérique et périurbanisation », *Géocarrefour*, vol. 76, N°4
- [6] ROUSSEL I.... 2003 Contribution à une meilleure connaissance de l'évolution régionale et temporelle des déterminants de l'exposition individuelle rapport AFEME février 2003
- [5] ROUSSEL I. a multicentric study of personal exposure: what lesson? *Presentation in Dubrovnik IUAPPA congress* September 2003
- [2] WIEL Marc, *La transition urbaine*. Sprimont, P. Mardaga ed., 1999, 126 p.