



Urban planning and interactions with atmospheric pollution in Arve valley

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Atmospheric pollution is a major concern of urbanised areas and territory managers have to conduct efficient policies to decrease population exposure and vulnerability. Even if pollution peaks are subject to an important mediatisation and to a large part of preventive actions, background pollution remains responsible of the largest sanitary effects. They depend on (1) the concentration and the duration of the exposure and (2) to the kind of pollutants considered. Many sources of pollutants can be identified in urban areas as heating, industry or traffic; and each of them generates specific particles.

Currently, the major part of pollution risk studies focuses on modelling particle emissions and their dissemination in the environment. These kinds of studies highlight the hazard intensity and its spatiality, commonly named the hazard exposure. Another part of risk studies, less frequent, considers the vulnerability. Vulnerability is a complex concept that involves a wide range of scales and objects ranging from biophysical parameters to social characteristics. They notably concern accessibility to information, knowledge and perceptions about the risk.

The Arve valley (south-east of France) is subject to heavy pollution concentrations. High levels recording in this area have imposed the implementation of an Atmosphere Protection Plan. This type of plan is triggered if a peak occurs and enforces provisional binding measures for polluters, such as highway speed limitation for traffic emissions. These measures are only focused on emissions and have no effect for reducing vulnerability and exposition, for a long- and short-term time scales. An opportunity to ensure this objective is to consider how local urban morphologies can combine exposition and vulnerability situations. Indeed, cities have been planned without taking into account atmospheric pollution and morphologies. This context may conduct to the increase in both of these two risk components and producing hotspots of air pollution risk situations.

In this poster, we purpose to present a methodology for analysing the relationships between actual city morphologies and pollutants. To ensure this objective, we consider the spatial characteristics of vulnerabilities. We also consider urban morphology responsible for a large part of the population exposure, particularly because it influences people's mobility and the frequentation of specific areas. Last part of the analysis will integrate the local street morphologies and their ability to concentrate pollutants, mainly focusing on traffic emissions. For example, close and large buildings may create areas where the low ventilation increases concentration of pollutants.