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Assessing health risk using regional mappings based on local perceptions: A comparative study of three different hazards in three sites: Laos, Tunisia and Ecuador.

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INTRODUCTION: While human societies remain exposed to natural hazards, anthropogenic dynamics have dramatically increased the exposure to human-originated hazards. Meanwhile, vulnerabilities to such hazards can be managed, controlled or reduced thanks to public policies, through environmental control, sanitation and medical infrastructures and practices (Becerra, 2012). However, assessing such vulnerabilities faces difficulties. Besides the evaluation of hazards themselves through environmental and epidemiological measurements, evaluations and modelisations (Ghorbel et al. 2010), evaluating human vulnerabilities and capacities to face such hazards requires to understand the perceptions of the population exposed: these perceptions condition the local acknowledgement of such dangers but also the differences among the concerned public stakeholders and population for such an evaluation.

OBJECTIVES: The goal of these researches is to better understand how a human-originated contamination is perceived by local stakeholders. Our approach to such an evaluation goes through spatialising the corresponding hazards, along other constraints people may consider. We have assessed three mapped evaluations based on local perception at the regional level in three different sites in three different countries, each one corresponding to three different contaminations (tropical diseases, heavy metals and petrol). This communication tends to present these results and compare them in order to establish the efficiency of such a method for different contaminations and different social and environmental conditions.

MATERIALS AND METHODS: The Perception-Based Regional Mapping (PBRM) method is based on interviews of pairs of local people, supported by a map of the concerned area on which a tracing paper is set (Figure 1, Saqalli et al., 2009). A series of maps is therefore obtained, combined and analyzed through a Geographical Information System. The advantage of such a method is to obtain the local hierarchy of factors that described the territory according to the sampled population, from which the hazard can be evaluated. Such maps provide the inherent multidisciplinary environment of the concerned population, including local economy, sociology and environmental constraints that may condition the capacity to face environmental hazards. Moreover, because the map is already positioned, it can be compared and confronted to other spatial evaluations of the same hazard for validation. Finally, it is a low-cost and rapid method. The PBRM may be exact in terms of variable collecting and precise topologically, it cannot be precise spatially. Plus, a census of a perceived hazard does not prove the existence and/or extent of this hazard. Despite this, the census tests the adequacy between the existence and/or extent of the real hazard and the perceived hazard.

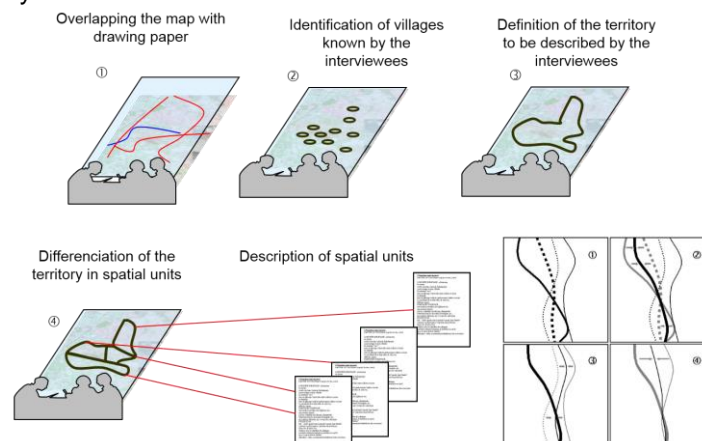


Figure 1 – The different steps of the PBRM process

RESULTS AND DISCUSSION: Laos, Tunisia and Ecuador have all in common exposure of population to contaminants coming from the exploitation of natural resources, which actually drove the interest of environmental scientists on such places: in the region of Luang Phabang (Laos PDR) (Figure 2), (Riboldi et al., 2011), it is the exploitation and paradoxically the spatial restriction of farming and the concentration of the population along rivers that may condition the exposure to bacterial contaminants. Around the former mines of lead and cadmium of Jebel Ressay (Tunisia), the signal of the exposure to heavy metals from the treatment waste dumps is mixed with other and more visible exposures (nitrates from intensive farming, dusts from a nearby cement plant). In the Ecuadorian Oriente, the petrol contamination may be paradoxically well-known as a global risk but not as a spatially precise one so that it can be considered now as part of the social landscape, along other social vulnerabilities such as unemployment and insecurity.

For each of the three case studied, the PBRM maps highlight common features:

The environmental hazards we investigated were rarely pointed out by the interviewees as the most important issues:

1. As chronic problems, they are “covered” by individually more vital issues (infrastructures, employment). As problems seen as complex, non-solvable at the individual scale, they are perceived as “beyond the scope” of one person and thereby often neglected.
2. As human-originated and human-affecting issues, there is an obvious correspondence between population density, sanitary risks related to the investigated hazards and a relative weakness of the State per capita: for instance, in Lao PDR, there may be more hospitals in high populated areas but actually less infrastructures per capita.

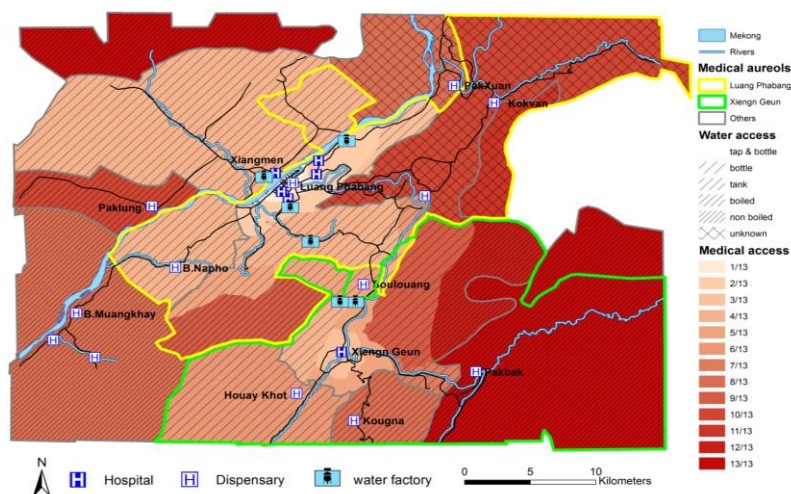


Figure 2 – Spatialisation of medical aureoles and medical/water access according to PBRM health interviewees

CONCLUSION: Such a method can be useful for apprehending rapidly the gap between perceived and “real” risks but also the inherent mixture of feelings and perceptions public stakeholders have to deal with. Finally, visualizing spatial differentiations may allow to go beyond the mean sanitary cover until the median sanitary cover.

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