Urban heat waves in Paris: developing a methodology for multi-objective spatial planning of nature-based solutions

Master thesis project (in progress) - Agathe Mommeja

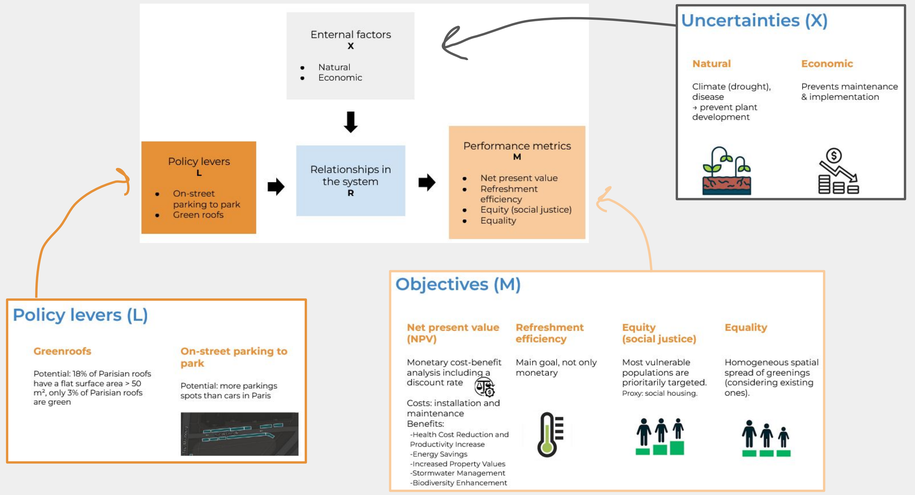
POLICY NEED

If nothing is done, by 2050, Parisians will be experiencing longer, more frequent heat waves, with temperatures reaching 50 degrees. Despite some studies to assess this, no temperature reduction goals have been set. Some pilot projects already implemented some nature-based solutions, and the soon-to-be-adopted Local Urbanism Plan rules to implement those as much as possible. However, the need for temperature reduction is not linked with the effect of the solutions. This is although necessary to scale-up these solutions at the city scale.

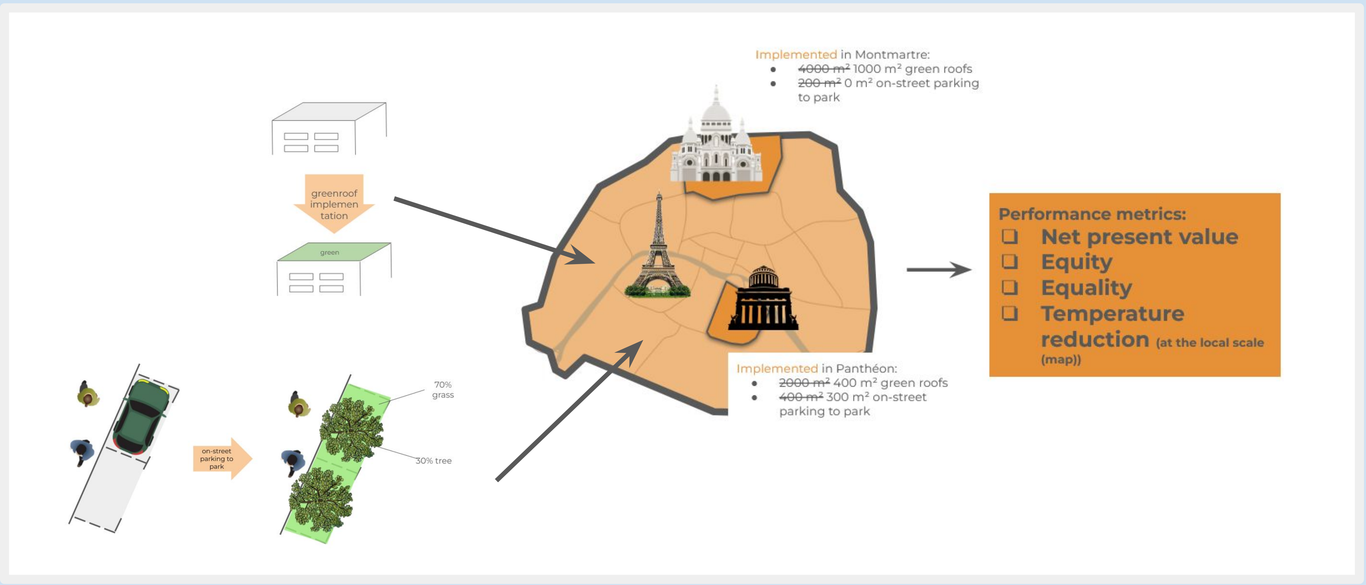
- What is the potential of each Parisian arrondissement for mainstreaming these solutions?
- What are the effects of the nature-based solutions levers?
- What are the costs and other co-benefits to expect?

METHODOLOGY

Conceptualisation. Use of the following XLMR framework (source: author):



Machine translation. Use of a multi-objective spatial optimisation for land-use algorithm system. A Pareto front based method is followed, using ε-NSGA-II.



Conceptual scheme of the output of the tool for the policy-makers. For each arrondissement (example: Montmartre, Panthéon), a given quantity of the potential of each of the 2 considered nature-based solution is implemented. All of that gives some performance metrics, aggregated at the scale of the city (including 20 arrondissements): net present value, equity, equality. Refreshment efficiency being meaningful at the local scale only, a map will be provided. Source: Author.