COOLSCHOOLS PROJECT

COOLSCHOOLS is a transdisciplinary applied urban research project that examines the transformative potential of nature-based solutions (NBS) to support the creation of climate shelters in European school environments. We assess how nature-based climate shelters can drive social-ecological transformations towards urban sustainability, climate resilience, social justice, and quality education at multiple urban scales (from schools to metropolitan region. Building on pioneering pilot NBS projects of school transformation in Barcelona, Brussels, Paris, and Rotterdam, COOLSCHOOLS unravels the specificities of each context and finds common patterns related to climate shelters transformation capacities, focusing on marginalized groups. Through participatory and co-creation methodologies, we propose an interdisciplinary approach that combines natural, bio-medical, social, and education sciences.

Creating climate shelters in Rotterdam schoolyards

Schoolyards are spaces in the city that can be seen as public infrastructure that works for its direct users and its surrounding community. The use of green schoolyards has benefits for children, increasing their health, well-being, and social life. However, the implementation of nature in schoolyards deals with different actors with different perceptions of quality, and there are some divergent perspectives regarding the safety of schoolyards as open spaces. Also, there is a lack of evidence knowledge of how much Nature-based solutions (NbS) in schoolyards are changing the local microclimate. So, the main objective of this research is to investigate the necessary conditions for NbS to create a climate shelter in schoolyards as an innovative strategy for urban transition.

For this, we will use the systematic review to outline the perception of safety in relation to greenery in urban areas. Examine users' quality and safety perception about using NbS in schoolyards using Fuzzy cognitive mapping. Use spatial analysis to visualize the connection between the perceptions and socio-economic indices and statistical analysis to assess the correlation between quality and safety perception and socioeconomic indices in different neighbourhoods. Then, with the green schoolyards evaluation tool and microclimate measurements, the quantity of nature and grey in schoolyards will be evaluated, and the NbS effect in the local microclimate will be apprised. The research is expected to improve the formulation of more accurate guidelines for green schoolyards, considering the socio-economic differences across the neighbourhoods. Also, it indicates the amount of green intervention and access to the benefits that green schoolyards bring to the local microclimate.



Research Goals

The main goal of this research is to investigate the **necessary conditions for NbS to create a climate shelter in schoolyards** as an innovative strategy for urban transition. For this, the research will assess users (children, parents and teachers) **safety and quality of the space perception** in different socio-economical contexts, appraise the **quality and quantity of nature present in schoolyards**, and evaluate whether there is a potentcial positive **impact of NbS on schoolyards on the local microclimate**. To achieve this objective, we intend to address the following.

- Assess the existing literature under safety factors perceived by NbS users that can contribute to urban transition;
- Examine the quality and safety perception of users over NbS in Rotterdam schoolyards;

• Access the correlation between quality and safety perception and the socio-economic indices in different neighborhoods; As well as different perception in gender;

• Apprise NbS effect in local microclimate.

The first stage of this research intends to uncover evidence-bases evidences in relation to safety perception in green urban spaces. Secondly, Fuzzy Cognitive Mapping (FCM) will be used to **examine the safety perception of users concerning the use of NbS in schoolyards**. This methodology is chosen since it allows access to different perspectives and interpretations of users. Then, the research will combine the results obtained through the FCM on how different users of green schoolyards perceive safety and quality in schoolyards with the **variations of socio-economic aspects distributed in Rotterdam**. We will also be able to acess the possible differences of safety and

Methodology

quality perception of boy and girls. Through this combination of the indices collected in schools and the socio-economic indices, we can **analyze the possible correlations between the different perceptions.**

Lastly, we will appraise the **NbS effect in the local microclimate** to evaluate the quantity of nature and grey in schoolyards. The research will use two methods: (1) Green schoolyard Assessment Tool and (2) Air temperature and humidity assessment using stationary air temperature and humidity measurement stations.





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