



Smart control of the climate resilience in European coastal cities

Building Climate Resilience in Coastal City Living Labs Using Ecosystem-based Adaptation: A Systematic Review

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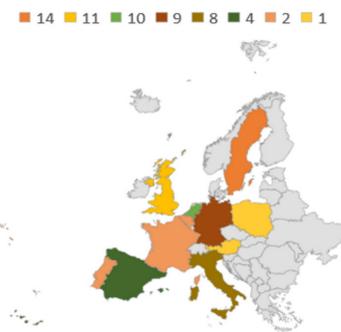
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ABSTRACT

Climate change leads to an unequivocal rise in the intensity and frequency of natural disasters. This necessitates mainstreaming of climate adaptation strategies in the global movement on climate action. Ecosystem-based Adaptation (EBA) has become popular as an effective means of climate adaptation, which can be resilient and flexible compared to hard engineering-based measures. However, ecosystem-based approaches in disaster risk reduction still remain under-researched despite their growing popularity. This study delves into the utility of EBA in the context of the living lab, using a PRISMA based Systematic Literature Review. A living lab (LL) is a participatory tool invented to foster innovation through real-life testing environments, such as individual cities. This study focuses on European coastal regions, as these are both highly populated and vulnerable to climate change impacts such as sea-level rise, storms, flooding and erosion. This study identified multiple synergies between the EBA concepts, living lab and disaster-risk reduction and concludes that EBA schemes can be highly effective in the living lab set-up. It also demonstrates that increased stakeholder engagement and the consideration of socio-economic co-benefits as part of the EBA-LL model can lead to successful disaster risk reduction.

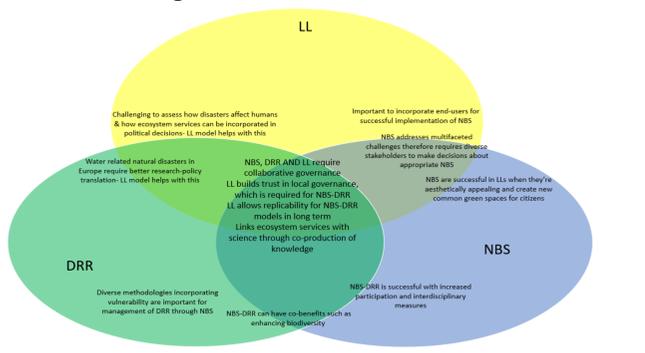
STUDY AREA

The number of publications included in the study based on the country of application



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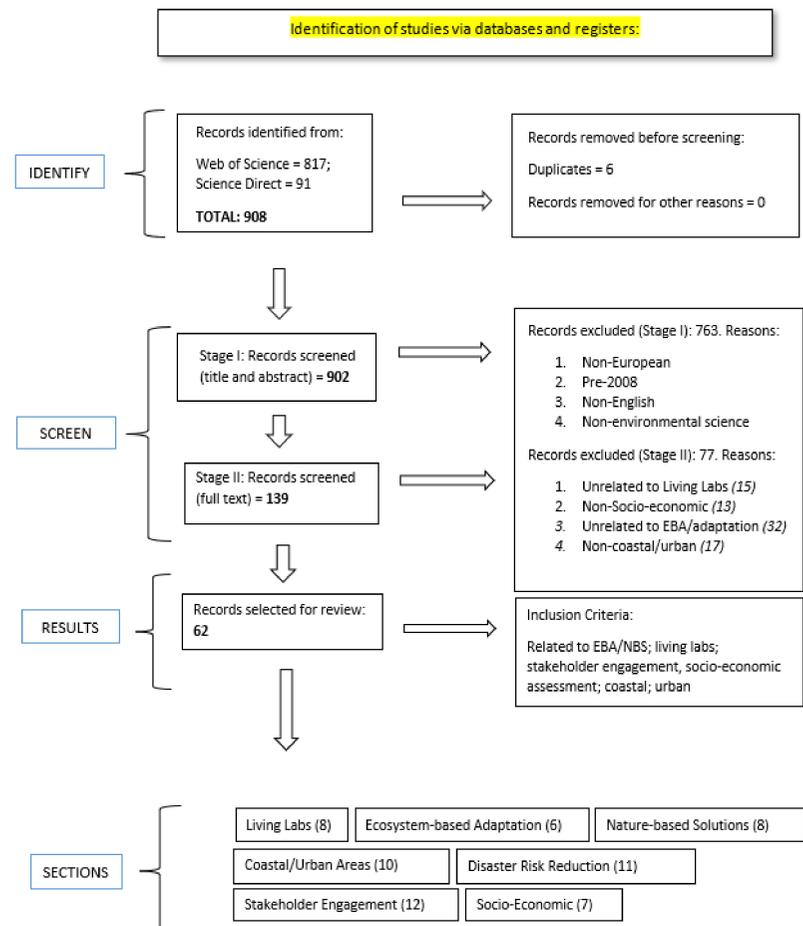
Linkages between NBS, LL and DRR



CONCLUSION

-This article demonstrates the potential NBS has to address coastal natural disasters (e.g. coastal dunes; sea-dikes; managed realignment). Authors have found that many a times NBS can be more resilient, cheaper and flexible compared to hard-engineering-based infrastructure.
-Multiple studies indicate the importance of stakeholder engagement for both NBS as well as LL implementation. While the LL model has clearly defined stakeholders (such as academia, government, private sector and civil society), stakeholder engagement processes are key for effective decision-making in NBS initiatives.
-This article found that it is critical to include a socio-economic analysis of costs and benefits to effectively implement NBS projects. Socio-economic factors like education, income levels, environmental attitudes and so on, significantly affect the success of NBS-LL-DRR schemes.
-Through a detailed analysis of the review papers, several synergies were found between the concepts of NBS, LL and DRR. Although the NBS-LL model can be effective at DRR, the synergies between these three concepts have rarely been analysed before.
-This paper offers important insights into the relationships between concepts such as LL, NBS, DRR and more, it also helps define additional research gaps as well as provides a direction for future research prospects. These includes gaps relating to the linkages between NBS and LL; the linkages between NBS and DRR; hybrid NBS; relationship between EBA and NBS; and further research possibilities relating to these gaps.

PRISMA Diagram



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