

Potential of green roofs to support urban rainwater management: hydraulic experimental assessment

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INTRODUCTION & AIM

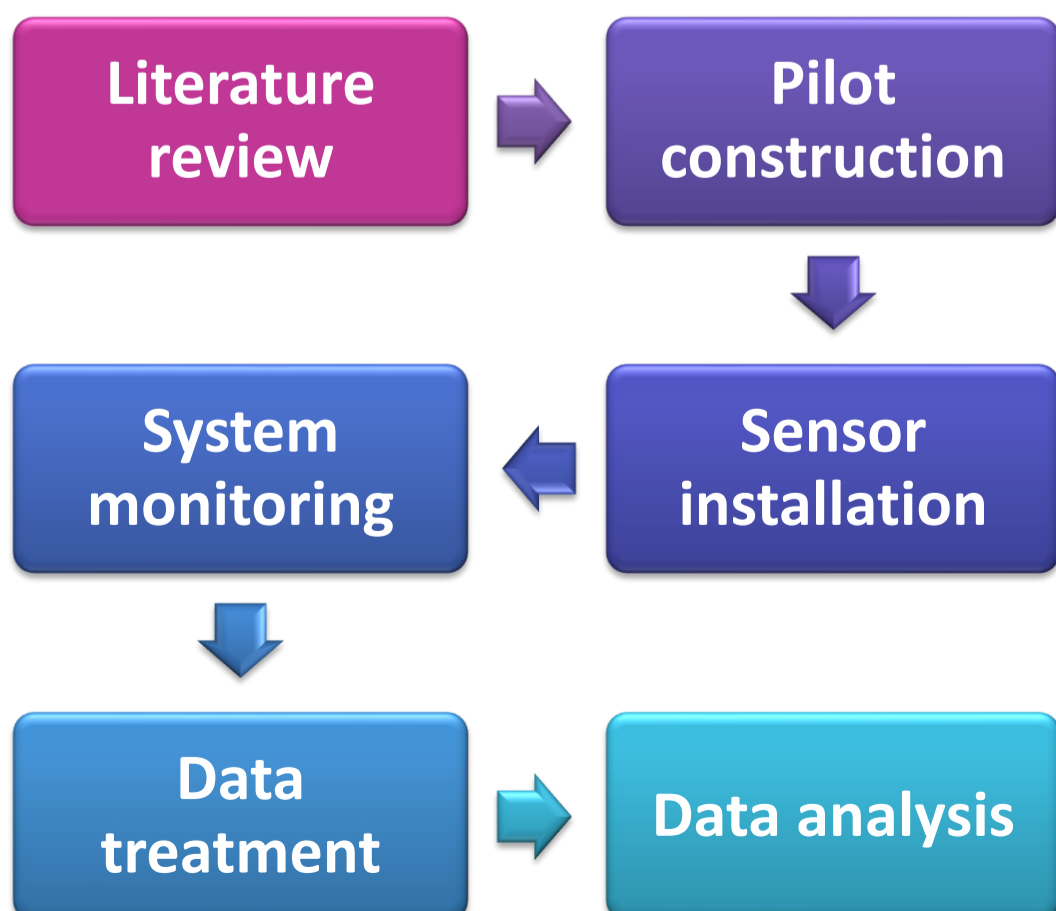
Green roofs are one of the nature-based technologies most largely used in the construction sector. However, even if it can be considered a mature technology, there are no consolidated design standards or guidelines particularly describing how to estimate rainwater volume retention in green roofs at national and international levels.

So, the aim of this study is to analyze the hydraulic effect of green roofs on rainwater management based on experimental outflow rate monitoring.

METHOD

The experimental setup was installed at Ballerup in Denmark and consisted of three pitched roofs each one with 25 m² of surface area and monitored over 1 year. Meteorological data were obtained using a weather station located just on the side of the pilots.

The water outflow of the green roofs was monitored by measuring the rainwater flow rate in the pipe that collects water in each green roof.



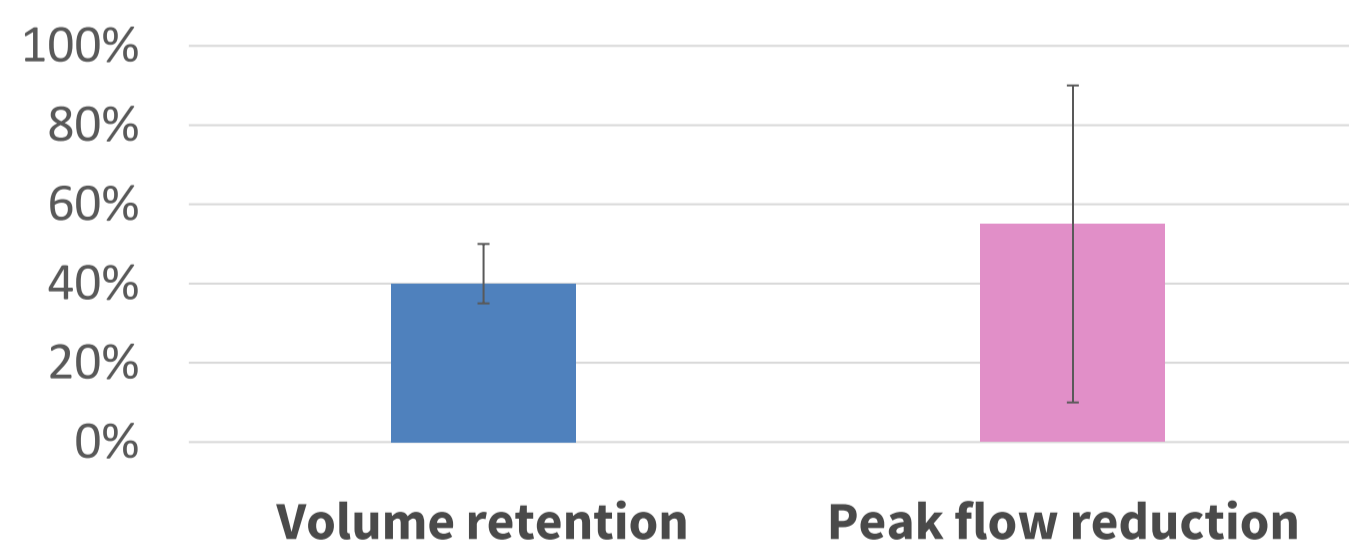
Research methodological steps

RESULTS & DISCUSSION



Green roof pilot system

The green roofs presented variations in annual rainwater retention capacity, ranging from 35% to 50%. In terms of peak flow attenuation, it varied from 10% to 90% in both green roofs, depending on rain intensity and the duration of dry periods.



CONCLUSION

The results obtained outline quantitatively the differences between green roof types in terms of water retention. These findings can be used to support future studies addressing green roof design optimization.

FUTURE WORK / REFERENCES

Further studies will be carried out in order to monitor the water quality and to determine run off coefficient for different rain events.