



## Quantifying the environmental sustainability of stormwater management systems

**Brudler, Sarah; Arnbjerg-Nielsen, Karsten; Hauschild, Michael Zwicky; Ammitsøe, Christian ; Hénonin, Justine; Rygaard, Martin**

*Publication date:*  
2019

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*

Brudler, S., Arnbjerg-Nielsen, K., Hauschild, M. Z., Ammitsøe, C., Hénonin, J., & Rygaard, M. (2019). *Quantifying the environmental sustainability of stormwater management systems*. Poster session presented at 10th edition of the Novatech conference, Lyon, France.

---

### General rights

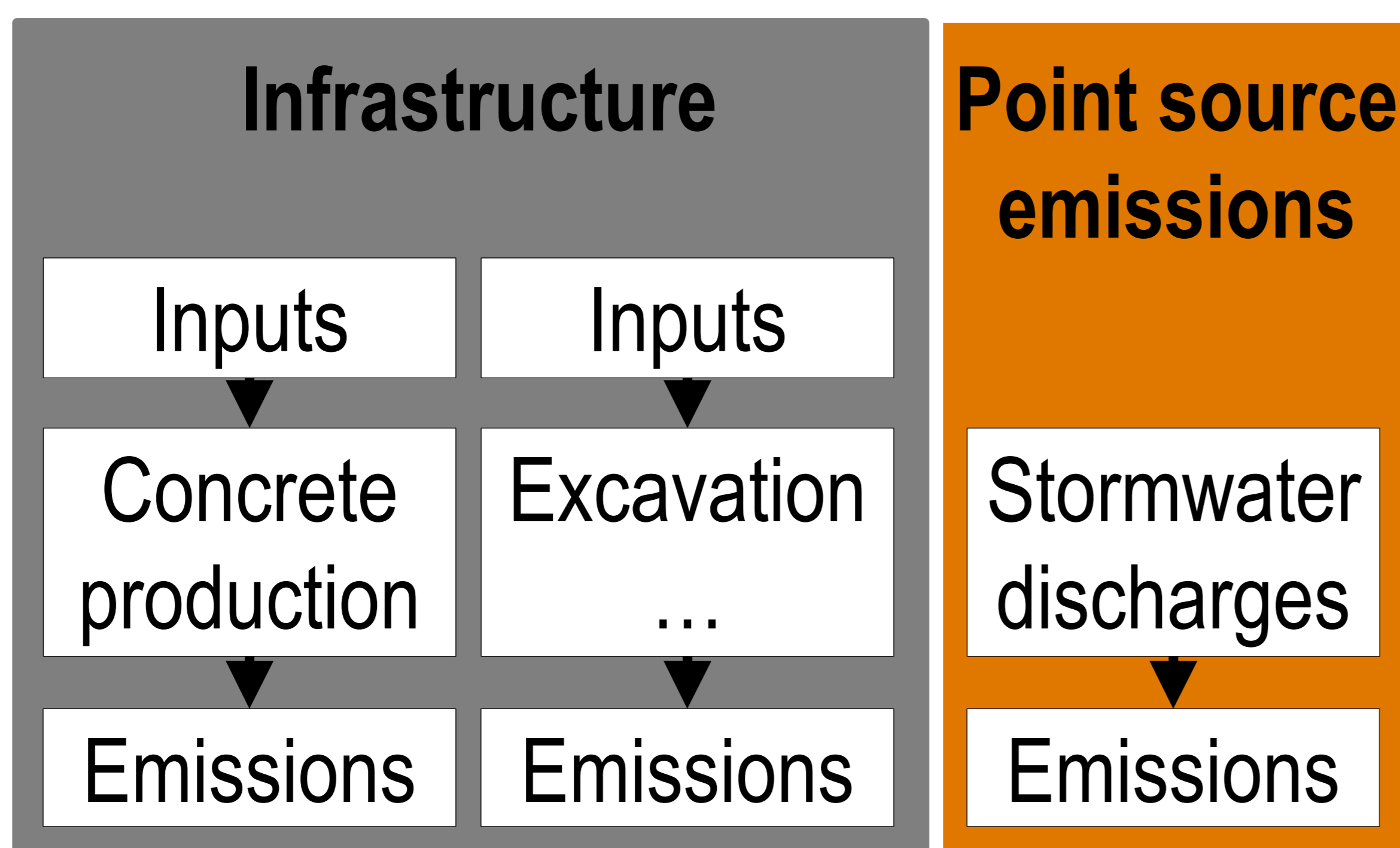
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

# Quantifying the environmental sustainability of stormwater management systems

## Quantifier la durabilité environnementale des systèmes de gestion des eaux pluviales



### Introduction

Stormwater management systems require inputs (materials, energy) and cause emissions through

- construction, operation and decommissioning of the physical **infrastructure** and
- **point source emissions** of polluted stormwater, leading to environmental damage.

### Methods and materials

We used **life cycle assessment** to quantify the environmental damage caused by **four different stormwater management systems** dimensioned for a residential catchment of 260ha in Odense, Denmark.

The assessment is based on a **comprehensive inventory** of all processes required over the life cycle of the different systems.

### Results

The subsurface combined and separate systems cause high **resource availability damage**, mainly caused by **material demands** for pipes and basins. The green infrastructure based systems (soakaways and swales) even avoid damage because of **avoided road renewal** where swales and curb extensions are installed.

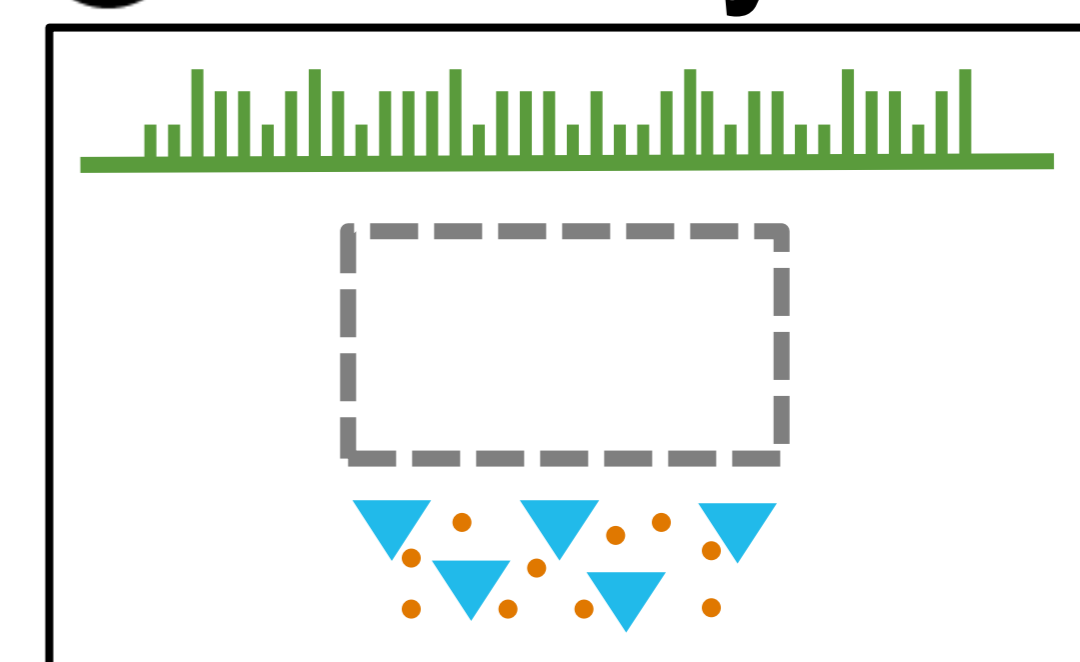
All systems cause similar **ecosystem damage**, which is mainly caused by discharges of **polluted stormwater**.

Changes regarding the assumed decommissioning processes and removal efficiencies affect the results significantly, highlighting the **potential to optimize** the sustainability in the planning process.

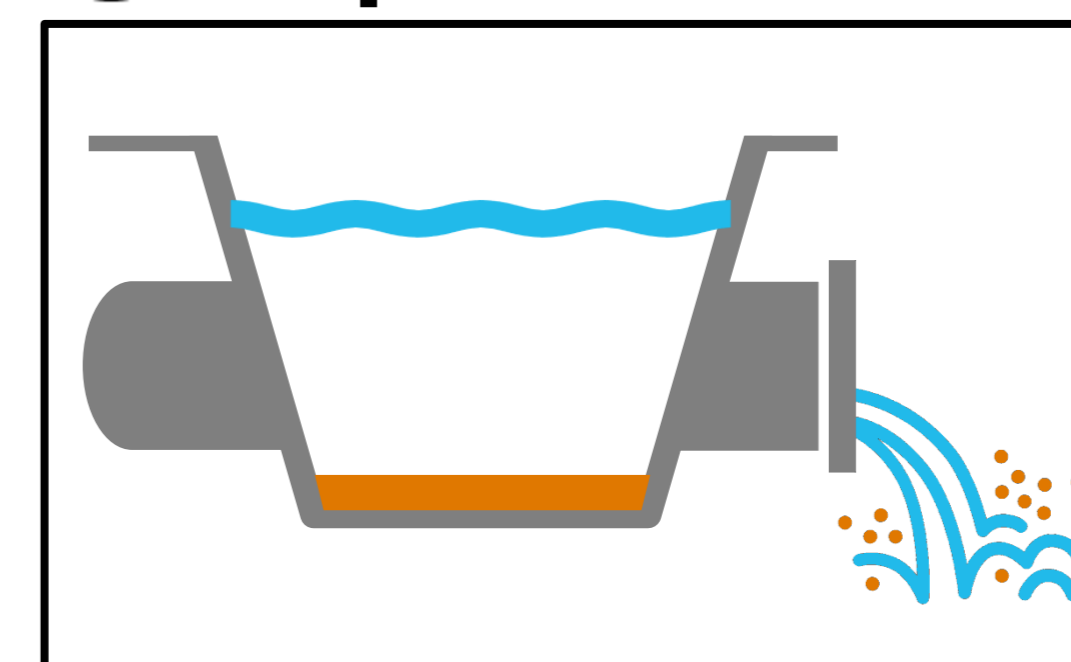
① Combined



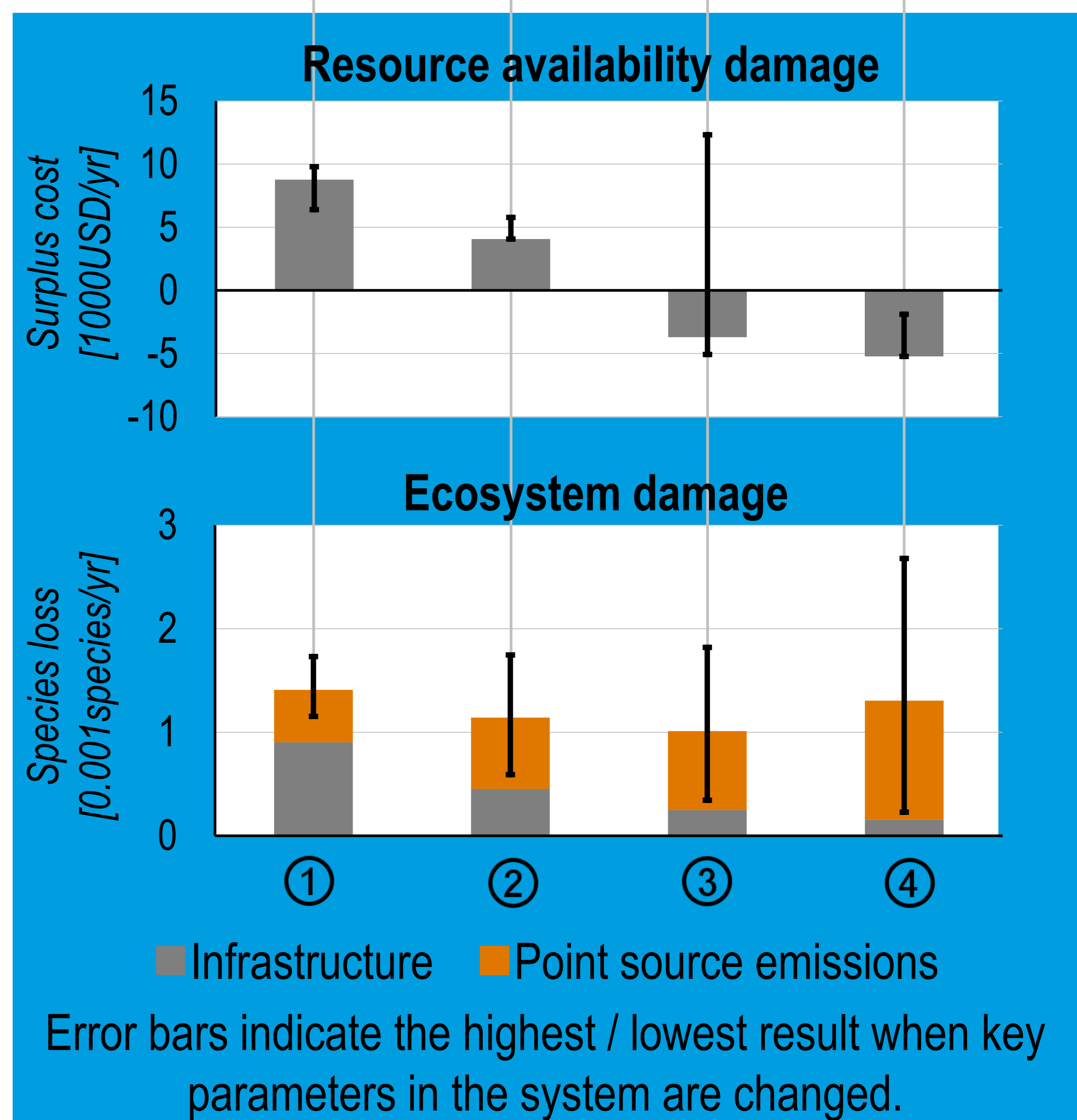
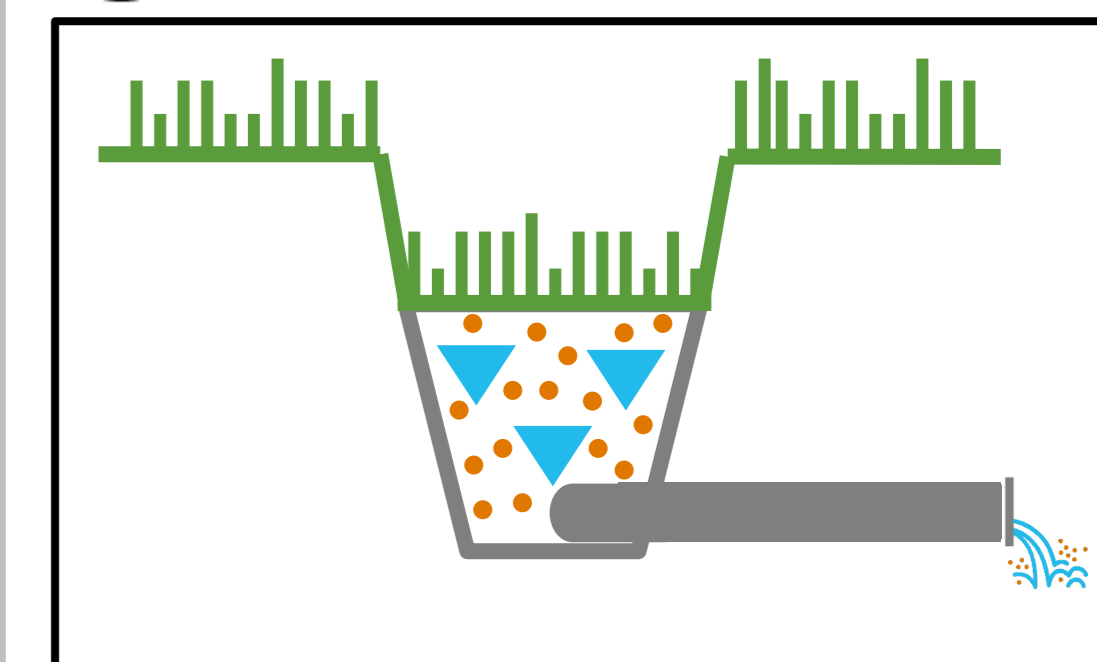
③ Soakaways



② Separate



④ Swales



**Sarah Brudler, Karsten Arnbjerg-Nielsen, Michael Z. Hauschild, Christian Ammitsøe, Justine Hénonin, Martin Rygaard**

