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Hacia un modelo de economía circular

Comparison of environmental impacts related to municipal solid waste (MSW) and construction and demolition waste (CDW) management and recycling

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Outline

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Introduction

Study area and reason behind the research

La Paz - Bolivia

Low-middle income city

About 950,000 inh.

Generation of about 650 t d^{-1} of MSW (mainly disposed of) and 350 t d^{-1} of CDW (unmanaged)

- What is **the impacts** of the CDW mismanagement system (compared to the MSWM system)?
- What does it affect in terms of **environmental indicators**?

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The Project - LaPazRecicla

Development Project financed by the Italian Agency for development cooperation

- Support of the MSW management system
- Information campaigns and technical courses
- Research and Innovation
- **Construction of the first CDW recycling facility in Bolivia**

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Objective of the research

Aim of the LCA

- To analyse and **compare the environmental impacts** related to the MSWM and CDWM system of La Paz
- To estimate the **contribution to the environmental impacts** that the CDWM system has compared to the MSWM system
- To find the **environmental impact indicators mostly affected by the CDWM** system
- To quantify **the contribution of recycling in reducing the environmental impacts**

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Methods

LCA – Scope definition, inventory, and interpretation

- **System Boundaries**: Formal MSWM system of La Paz & potential impacts related to CDW transportation and final disposal
- **Six environmental impacts** are assessed (GWP, EP, AP, HTP, FAETP, and depletion of abiotic resources)
- Mainly **secondary data** are used (software database)
- **WRATE v.4** has been employed for the analysis
- Introduction of a **scenario analysis** (improvement of the recycling rate)

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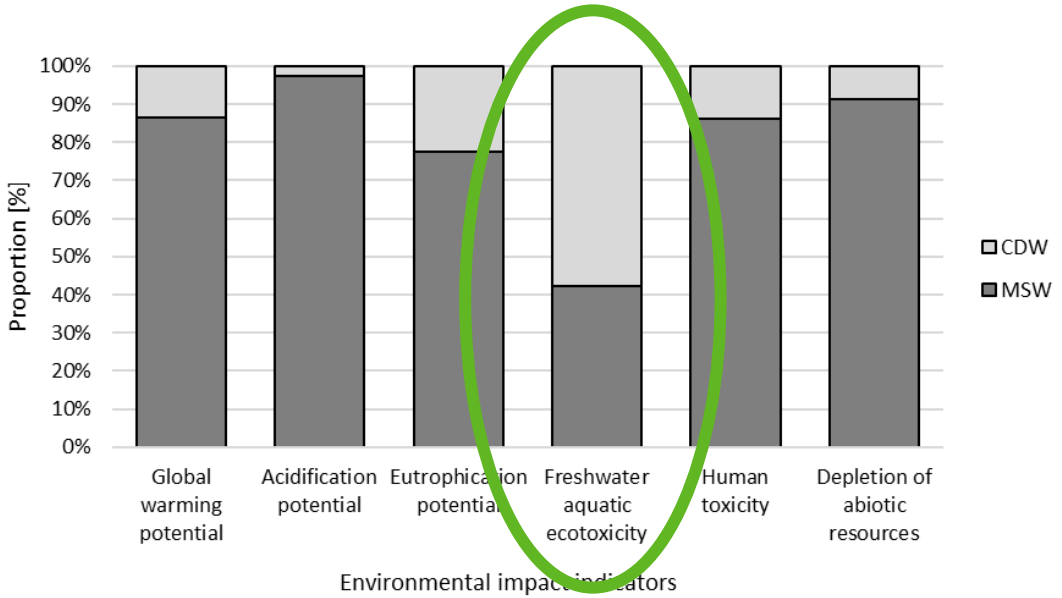
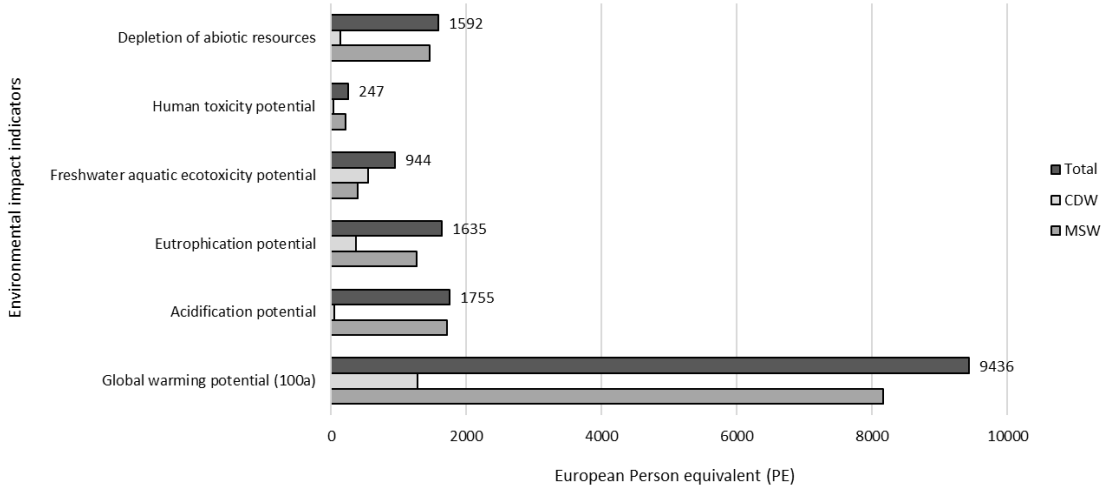
Results

Contribution per environmental impact (normalized value)

The FAETP is the one mostly affected by the CDW mismanagement.

!!! The **results are affected by the amounts of waste generated**.





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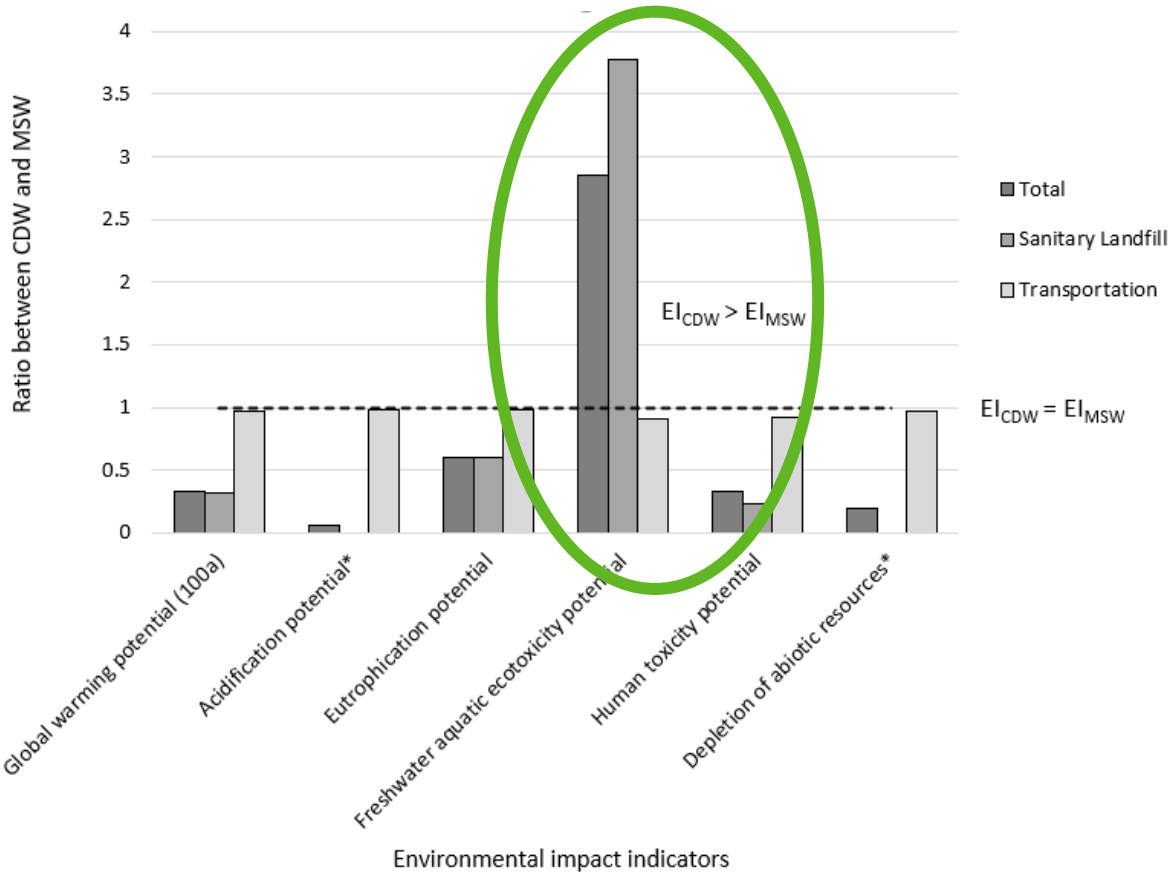
Results

Per ton of waste

The contribution of the CDW is <u>three time higher</u> than the management of one ton of MSW (mainly due to the uncontrolled disposal).



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Results

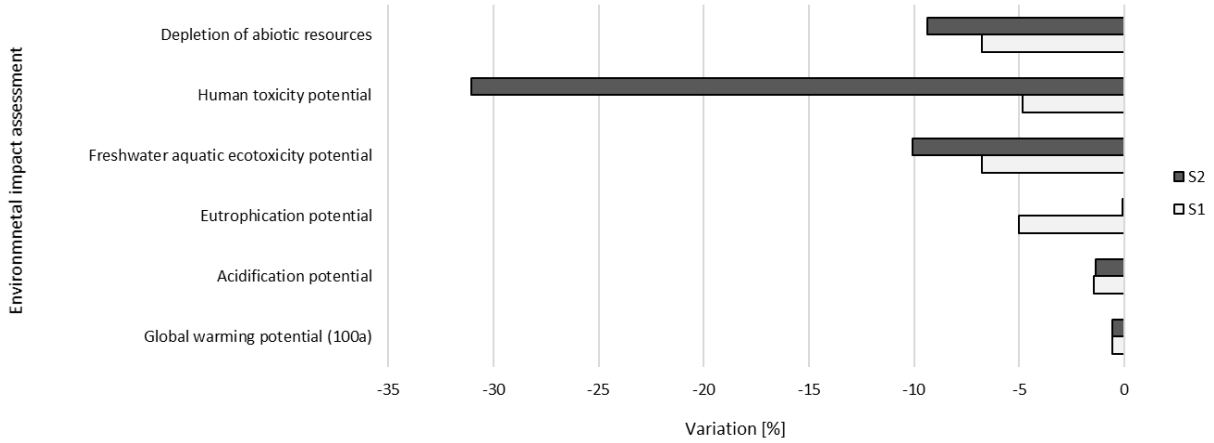
Scenarios analysis

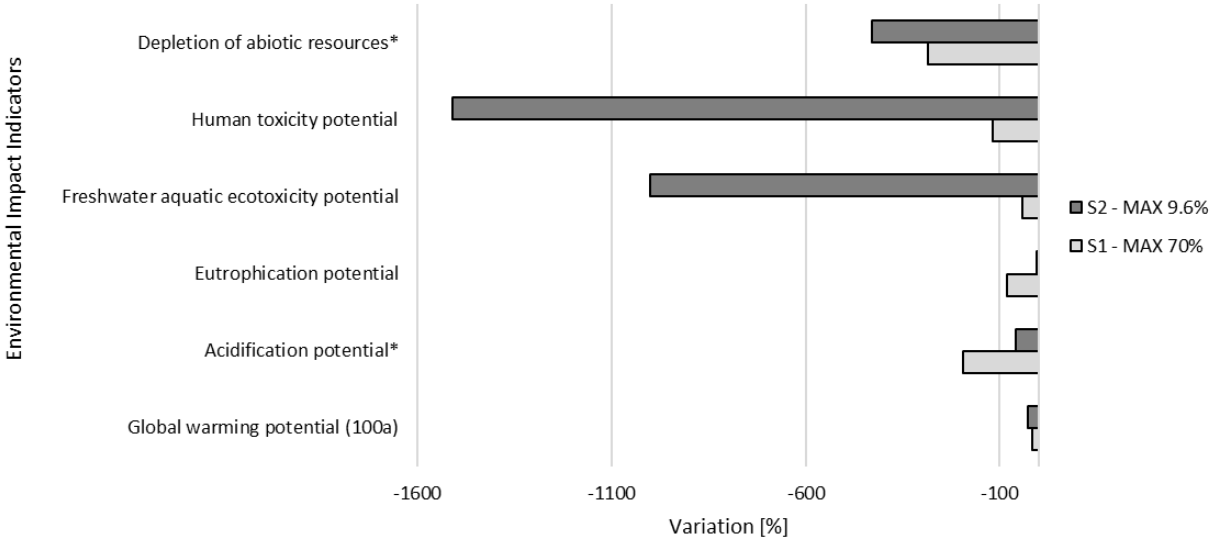
S1 – 20% CDW recycling (about 20,000 t per year)

S2 – +100% MSW recycling (about 300 t per year)

The scenario related to the Project LaPazRecicla can potentially reduce the environmental impacts of about 5 to 30%.

Recycling, if implemented for the whole recyclable waste generated, can considerably reduce three of six environmental impacts.





Discussion

Policy implications

- **CDW mismanagement should be addressed** in order to reduce the impacts related to the **FAETP**
- **Recycling** can be the **first step** for reducing 3 of 6 environmental impacts indicators
- Controlled disposal (CDW) and recovery of other waste fractions (MSW) should be involved in order to reduce the environmental impacts (**recycling is not enough**)

Limits: LCA modelling of the final disposal site!

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Conclusions

Remarks and future development

- **CDW should be prioritized in developing countries**. An appropriate MSWM system is not enough to be introduced!
- **Recycling** can be the first step for reducing environmental impacts in developing countries:
  - introduction of **appropriate and low-tech technologies**
  - **income** generated by the system
- **Small scale treatment plants** as well as pilot projects can support developing cities in starting now actions towards a sustainable development

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Thank you for your attention

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