

Public decision support & LCA: feedback from testing a simplified LCA tool for wastewater systems

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Environnementale

Epuration

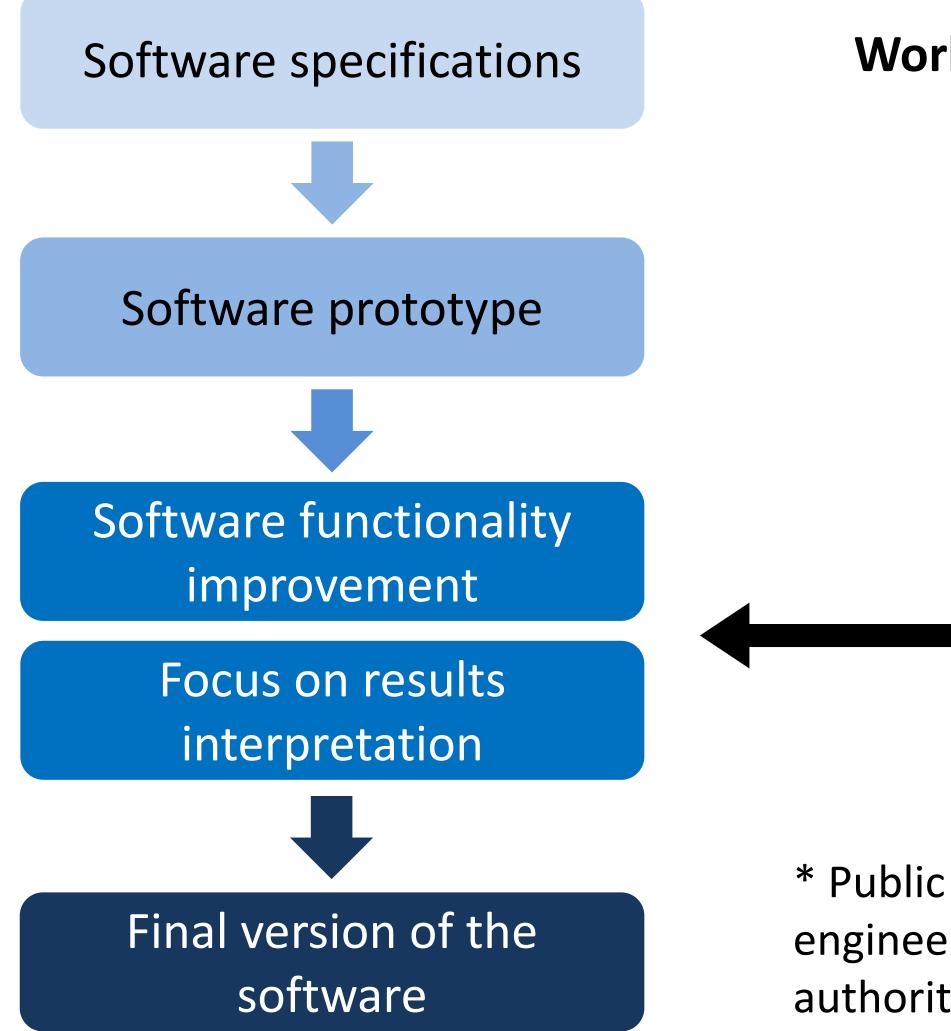
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introduction

Many studies performing Life Cycle Assessment (LCA) of wastewater treatment

plants already exist, but there is a lack of simplified and operational tools usable by non-specialists of LCA to perform LCA of entire wastewater systems (WWSs). The objective of this work was to develop a simplified software providing objective environmental indicators to be included in the decision making process along with other criteria when choosing among WWSs options.

SOFTWARE DESIGN PROCESS



Working group involving stakeholders*



materials & methods

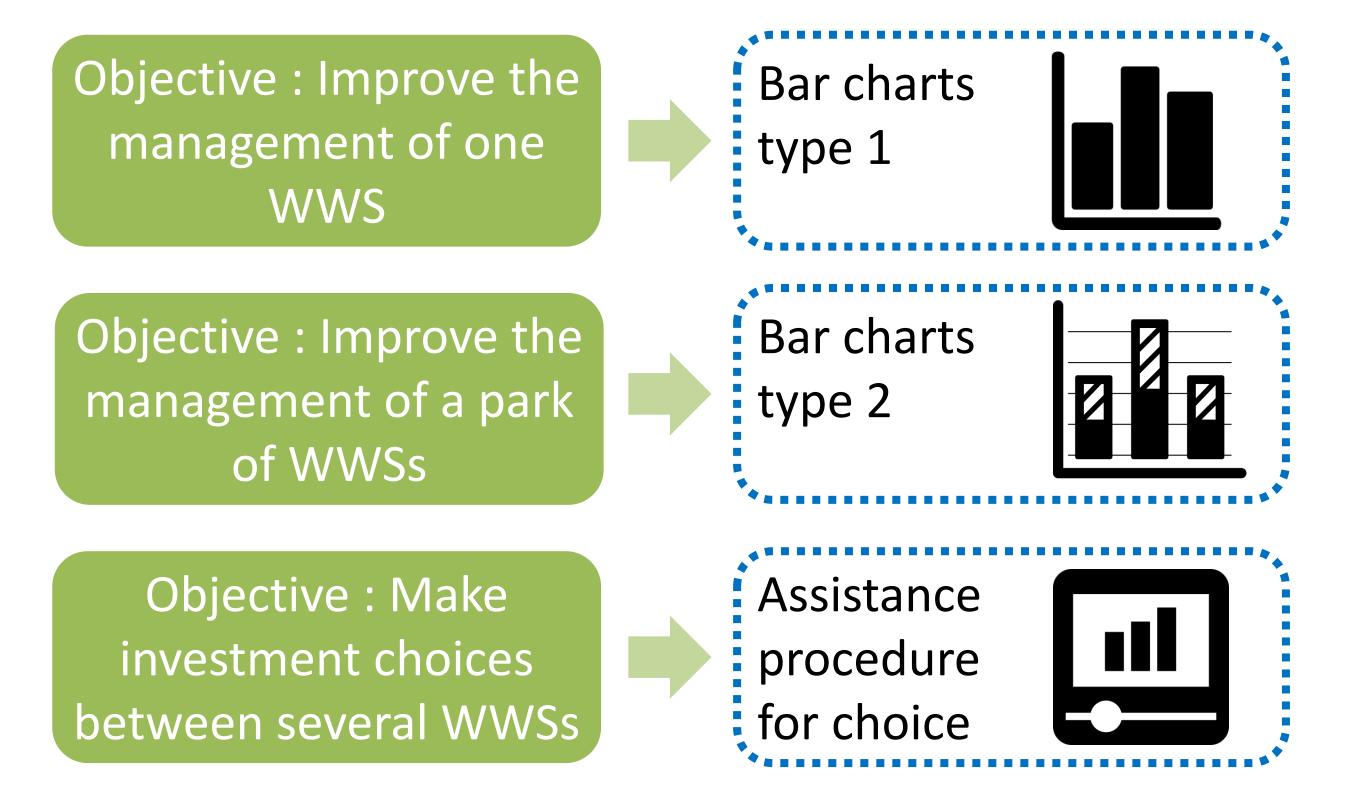
Specifications for a simplified software were defined and a first version was implemented (namely ACV4E software). ACV4E was applied to real cases (by 7 public wastewater services and 2 engineering consultancies), to test the software as well as the appropriation process and the effects on decision making. A working group involving stakeholders* was created in order to share experience feedbacks and improve the software. This group made a focus on the interpretation of LCA results, with the challenge of making them understandable and usable for non-specialists of LCA.

* Public wastewater services, engineering consultancies, water authorities, researchers

results & discussion

- The introduction of LCA in a local authority decision context showed that the environmental criterion was raised in a less subjective way but remained dominated by other criteria (like compliance with legal standards and financial aspects).
- Classical mid/endpoint bar charts proved to be inefficient for nonspecialist interpretation and for communication to politicians. Normalisation of the results almost always leads to misinterpretations. As a result of the working group process, these conventional charts were declined differently according to the issues

NEW DISPLAY MODULE OF RESULTS



they are supposed to address and an assistance procedure for

decision making regarding the choice of a WWS has been implemented within the software. This procedure progressively decreases the number of indicators in charts by criteria validated by users in order to make it easier to determine whether or not an option is better than another.

take home message

The co-construction of the simplified LCA calculator with potential users is crucial for appropriation. It partially opens the LCA black-box and allows to better meet field needs.

The author(s) acknowledge(s) all contributors for their participation to the software test and/or for their financial support and notably the following partners:











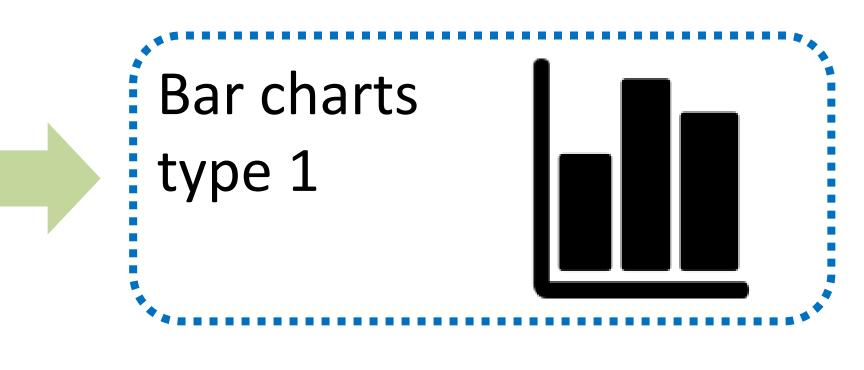
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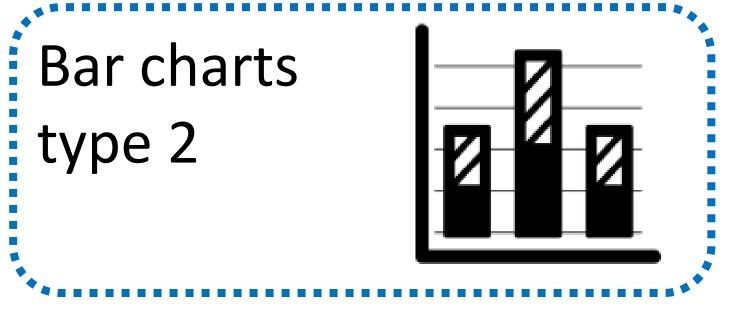
NEW DISPLAY MODULE OF RESULTS

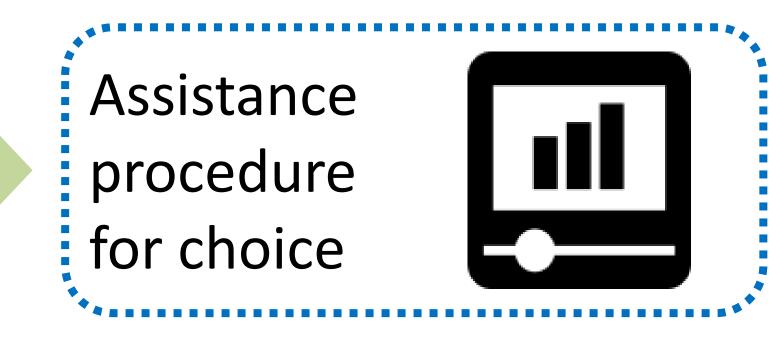
Objective : Improve the management of one WWS



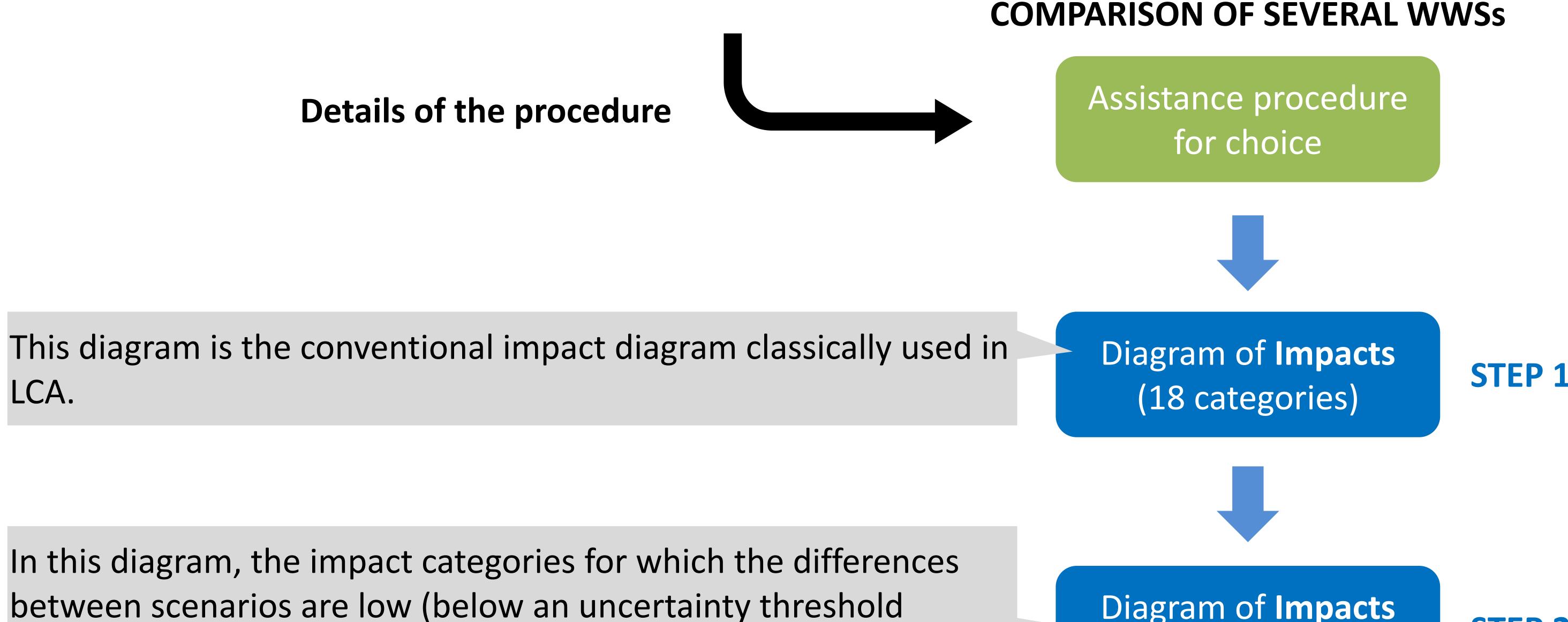
Objective : Improve the management of a park of WWSs

Objective : Make investment choices between several WWSs





WWS : wastewater system



inherent in each category*) are removed.

Diagram of Impacts ((18 - x) cat.)

In this diagram, the impact categories that contribute the least to the damage are removed (that is to say the categories for which the damage is less than 1% of the highest damage for all scenarios). The category "Sea eutrophication" is maintained as it is not quantified in damage.

This diagram is the conventional damage diagram classically used in LCA. Damages bring together all impact categories, including those that have been removed in the previous steps.

Diagram of Impacts ((18 - (x+y)) cat.)

STEP 3

STEP 2

Diagram of **Damages** (3 cat.)

STEP 4

In this diagram, the damage categories for which the differences between scenarios are low (below an uncertainty threshold inherent in each category*) are removed.

Diagram of **Damages** ((3 - z) cat.)



T For these displays, quantification of the number of occurrences for which the scenario X is better or worse than others.

* Threshold from 10% to 30% depending on impact categories (adapted from Jolliet et al. 2010 - ACV : Comprendre et réaliser un écobilan, 2nd edition 2010, p107)

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