

The GeDSeT Project: coupling multi-criteria analysis and knowledge improvement on sediment for a close-to-the-field Decision Support Tool

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Introduction: Waterways in southern Belgium and northern France present similar characteristics and are deeply connected. Both regions present dense habitats and industrial pattern which have impacted the quality of the aquatic ecosystem and in particular the sediments compartment. This constitutes a major environmental issue, both for the management of huge amounts of dredged sediments and for the strategic geographical position of this sustainable transport network towards Northern Europe. In order to address waterways sediment management in a transboundary way, the GeDSeT project aims at developing a decision support methodology^[1], based as well on public and private know-how as on research results on specific environmental issues.

Tool development methods:

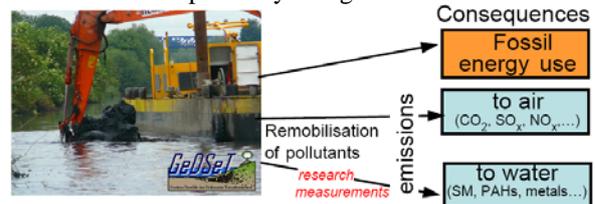
Conception: steps and techniques in the management process were listed from literature and professional background. Key parameters that may influence decisions were then identified and confronted to global issues. Potential positive or negative impacts were translated into indicators.

Database: The tool database used is fed by both literature and survey data on the societal and economic data. Besides, knowledge on environmental impacts was gathered from focused research modules within the project. Five actions covering 3 main themes were developed to feed the Decision Support Tool: *on site* characterisation of the pollution pool in sediments, potential transfer of pollutants from sediments toward aquatic and/or terrestrial ecosystems, and finally treatment of contaminated sediments. Common sites, both in France and Belgium, were regularly sampled and monitored in order to share research on dredged sediments deposits (F), clustering sites (B) and canals during dredging.

Results: Sustainable development issues were used as a guideline to identify consequences and effects of technical choices all along the sediment management process. Criteria on economical development (employment...) and living environment (risk perception, land value...) were qualitatively assessed

through stakeholders interviews. Four criteria related to environmental impacts (fossil energy uses, climate, ecosystem quality and human health) were quantified through the impact characterisation method from life cycle analysis.

Research results were implemented in the database. The figure below illustrates how the dredging step is integrated in the tool: beside literature data on air emissions and energy use, the consequences of dredging on the ecosystem quality were measured through water monitoring before, during and after dredging on a French canal^[2]. Impacts on the environment are presently being assessed.



Discussion:

The management of waterways sediments may take profit of the project's outcome through scenarios, concerning benefits of selective dredging, opportunities to refer and pre-treat sediments for valorisation, choices of proven or emergent treatments ...

The global benefit of the project can be accounted for in the assessment of sustainability gains from:

- improved water transport networks and a higher water transport rate,
- reduced mineral extraction needs for civil works or brownfields revitalisation,
- reduced land use needs for sediment disposal.

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References: [1] Lemièrè et al. (2010) *Déchets, Sciences et Techniques*, 57 :2; [2] Alary et al. (2011) *The GeDSeT project: how to assess the impact of a dredging operation?* SedNet Conference, Venice (Italy).