

GeDSeT, understanding sediment contamination and behaviour to facilitate its reuse and contribution to the circular economy of minerals

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Introduction: Sediment disposal is an increasingly acute issue for waterways management, due to increasing disposal costs and to disposal site shortage in densely populated areas. Sediment reuse would bring a smart answer to both but it is not often used due to technical and regulatory bottlenecks, and to higher direct costs.

Methods: The GeDSeT project on waterways sediments aimed at promoting their reuse through innovative technology development (on-site characterisation, impacts monitoring, long term behaviour understanding, processing technology) and a decision support tool allowing to take into account indirect benefits and natural resources savings [1].



Fig. 1: Sediment used as a resource for further reallocation in fluvial civil works.

Several on-site technologies, including pXRF (see Figure 2) and FTIR for sediments, passive samplers and multiparametric probes for water impacts, allowed continuous monitoring and quasi-real time information to be incorporated in decision making [2], [3]. Disposal site phytomanagement and sediment ageing pilot tests, mineral processing pilot tests, and cement incorporation tests generated a pool of information which enriched the decision-making tool knowledge base.



Fig. 2: On-site sample analysis.

Discussion: GeDSeT, through its decision support tool but also through research results, highlighted significant possible indirect benefits currently not taken into account by accepted linear economy models: natural resource extraction reduction, reduction of land needs for disposal sites, beneficial use of older disposal sites at the Euroregion scale. It also highlighted regulatory barriers to sediment reuse: constraints in relation with the waste status and the waste holder responsibility; lack of any end-of-waste status framework, restrictions to transboundary applications. Sediment reuse is also hampered by public acceptance and by social responsibility issues, due to limited validation data on previous applications. Larger pilot-scale demonstrations will therefore be the next step in incoming projects by demonstrating the economic viability and safety of reuse options.

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References: [1] Lemièrè et al. (2013) *Sednet conference, Lisbon*; [2] Lemièrè et al. (2014) *GEEA 14*: 257-264; [3] Lemièrè et al. (2016), *I2SM conference, Montreal*