

Sediment management in a circular economy

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Conference theme number(s): 2,3,4,5,6,7,8

Introduction: In 2022 the Dutch Ministry of Infrastructure and Water management developed roadmaps for improvement of the sustainability of the different field of activity's activities of Rijkswaterstaat, the Asset Manager of the main Dutch water systems and roads. The roadmaps for different fields of work describe the route towards a climate neutral and "circular" way of working.

Methods: Starting point is the widely accepted definition of a Circular Economy (CE) of the Ellen MacArthur Foundation. CE is not a goal on itself but a tool for reaching sustainability goals. In particular CE is about the use of scarce raw materials. Relevant stakeholders were involved in developing the roadmap. For (circular) sediment management this are regulators, clients, contractors, knowledge-institutes and consultants. To identify opportunities for improvement of the current practice, we made use of a conceptual model of the actual playing field for sediment management.

Results: Besides a route for changing the engines and energy carriers of the equipment, the roadmap for dredging and beach nourishment also addresses the circularity of the management of dredged sediments. Although still abundant now, sediments are becoming increasingly scarce in the Netherlands. The Dutch coastline and riverbeds are eroding, the soil (in polders) is slowly sinking, whilst the sea level is rising. For improving the circularity of sediment management, we identified three main targets:

1. Protection of stocks of sediments;
2. Reduction of negative environmental impact due to the extraction of sediments;
3. Retention of the value of the sediment during the use of it.

Ad1.

Policies and regulations create a playing field for sediment management and therefore are important instruments. Relevant are (a.o.) policies and regulations for the protection of water and sediment quality and the National decision making process on the need for dredging. The implementation of EU policies for the protection of the environment, such as the Water Framework Directive and the Waste

Framework Directive into the Dutch regulatory framework created a playing field in which the practice of sediment management is quite circular already. Approximately 80-90 % of the dredged sediments nowadays is beneficially used. However, sediments are still being polluted and this poses a threat for the future use-ability of the sediment stock. Improvement of policies and regulations by policy-makers therefore is a very important instrument for improving the CE of sediment management. For implementation it is important that regulations are clear and fit for purpose.

Ad 2, 3

The second and third target refer to the design of -, and execution methods used in dredging projects. Expertise of Clients [1] and Contractors has to be used for reaching the second and third target. Building up of knowledge and innovation is necessary for improving policies and regulations but also to improve current practices.

Discussion:

Although sediment management (dredging) is an important tool for water management, the Water Framework Directive does not address sediments explicitly. Only this year a technical document [2] on sediment management was published. The Waste Framework Directive does not take the specific characteristics of (dredged) sediments into account. Rigid interpretation therefore can lead to inadequate management of dredged sediments. Exemptions for sediment management in both EU directives show that there is/was doubt if those Directives were suitable (fit for purpose) for regulating sediment management. How can we make sure that (clear) regulations will facilitate a circular sediment management? Is it necessary to clear things up on the EU level? Should we have a technical document on sediment management under the Waste Framework Directive too?

References:

[1] Dredging for Sustainable Infrastructure, SBN: 9789090313184 | CEDA | IADC (2018).

[2] CIS, Integrated sediment management Guidelines and good practices in the context of the Water Framework Directive (2022).