

Water Authority Schieland and the Krimpenerwaard, NL, Preventing land subsidence: Using Sediment As a Resource (USAR)

G.H. Verweij, MSc¹

¹ Water Authority Schieland and the Krimpenerwaard, Rotterdam, NL

Phone: +31-(0)-10-4537251

E-mail: g.verweij@hhs.nl

Introduction: As part of the Interreg 2 Seas 2014-2020 Programme funded project ‘Using Sediment As a Resource’ USAR, The Regional Water Authority of Schieland and Krimpenerwaard (HHSK), The Netherlands will execute a pilot in 2018-2019 in which locally dredged sediment of high-organic composition will be upcycled, by blending it with other local waste products, e.g. green waste, animal manure and water purification deposits. This transforms the sediment into a valuable resource that can be used to elevate low-lying and sinking peatlands. Large areas of peatland in Dutch polders are compacting. This results in the last decades in sinking land elevation levels with big consequences for water management, bio diversity, economical and ecological utility, CO2 emissions etc. HHSK dredges yearly approx. 150.000 m³ from waterways at an average costs of €3.000.000. The HHSK pilot entails the first full-scale test of a promising concept, developed by Dutch engineers, called Toppersurf [1]. The pilot investigates prevention of land subsidence of the low lying peatlands at risk of flooding as well as improvement of the soil quality with at the same time a positive effect on the reduction of sediment landfill, the costs of dredging, CO2 output and disturbance for the environment (no/less transport needed).

Methods: To prevent land subsidence of the low lying peatlands at risk of flooding as well as improvement of the soil quality to a valuable resource HHSK will execute a pilot together with the stakeholders involved such as (Dairy) farmers from the Krimpenerwaard and Toppersurf-Nederland (TSN) [2]. For the pilot are 5 test locations available of 5 hectares each, which are private property. The owners will make their land available for the project. On the test locations locally dredged sediment of high-organic composition will be upcycled, by blending it with other local waste products, e.g. green waste, animal manure and water purification deposits. This transforms the sediment into a valuable resource that can be used to elevate the low-lying and sinking peatlands as well as making a positive contribution to the manure problem, e.g. by the closing of the phosphate cycle. At the end of the pilot, the owner will continue using the areas (with Toppersurf layer), of farm land and carry out the regular maintenance.

In order to optimally measure the effect and various mixtures of Toppersurf Land these compositions will be tested and compared.

The applications of sediment in this new mixture of Toppersurf Land should measurably result in more efficiency in the use of resources (less volume of waste, volume of recycled sediment, volume of saved primary raw material). These changes are permanent. If the (local) partners will continue applying this circular approach as part of their regular way of working, it is to be expected that more similar results will be realised in the future.

Results: This pilot aims to contribute to the objective of HHSK: “dry feet and clean water” and besides we compensate land subsidence and are able to structurally improve the soil quality. Also, direct costs and time for dredging activities will reduce considerably as well as the indirect costs because of less transport and nuisance for the environment. Besides, the CO2 emission will be reduced conform the HHSK Corporate Social Responsibility policy..

Discussion: Dredging is a never-ending obligation of water managers, as the deposit of sediments in waterways always continues. At present waterway managers are not yet investing in sediment upcycling, as these are new, unprecedented technologies. This USAR pilot “Blending organic sediments with green and agricultural waste for soil elevation and improvement”, is an essential step to break the ground for the wider uptake of this concept. This pilot will demonstrate the general feasibility and roll-out potential of sediment upcycling in real-life conditions to waterway managers

Acknowledgements: As lead partner, HHSK gratefully acknowledges the contributions of our USAR involved partners.

References: [1] Agentschap NL (2010) *Compensation ground decrease and guaranteeing water maintaining in peatland by applying Toppersurf*
[2] Deltares et al. (2013) *Feasibility Study Toppersurf Krimpenerwaard*