

Dredging for Sustainable Infrastructure: A New Holistic Approach

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Background/Objectives. Back in 2008, the International Association of Dredging Companies (IADC) and Central Dredging Association (CEDA) joined forces to create and release *Environmental Aspects of Dredging*, a book presenting the effects of dredging activities on ecological systems and ways to minimize the impacts. As the concepts of sustainability continuously evolve, the demand for a revised publication encompassing the current holistic approach became paramount, and will be presented in *Dredging for Sustainable Infrastructure*. The dredging industry aspires to realize projects which fulfil their primary functional requirement while adding value to natural and socio-economic systems. This can only be accomplished once a thorough understanding of these complexities in combination with the proactive engagement of stakeholders is acquired. By providing imperative guidance, the updated edition strives to make this a possibility throughout the dredging industry. Written by a team of top industry experts, the publication aims to help professionals and stakeholders navigate the interrelated complexities involved in the development of coasts, harbours and ports.

Approach/Activities. For the vast majority of dredging's history, there has been an almost exclusive focus on the economic benefits generated by infrastructure. Within the last 50 years, environmental and social factors have been increasingly incorporated into the decision-making and governance process, a shift regarded to be a relatively recent development. Significant technological and operational advancements have improved the dredging process to reduce its impact on the environment. As a result of this progress, an optimized way to increase the overall sustainability of the water infrastructure sector has emerged. A project's proponents, dredging contractors and relevant stakeholders invest time and energy at the beginning of a project's timeline to identify ways to boost its value by addressing sustainability's three pillars: economic, environmental and social. With all three aspects considered, opportunities to create additional economic value will be revealed. Early efforts are spent to identify and develop socially-oriented enhancements for recreational, educational and community resilience purposes as well as environmentally-minded prospects related to ecosystem services, habitat and natural resources. This approach will benefit infrastructure projects by avoiding unnecessary conflicts with stakeholders while simultaneously developing a larger number of project proponents, advocates and partners.

Results/Lessons Learned. Three principles inform the development of sustainable infrastructure while firmly supporting the triad of sustainability pillars. The first principle is a comprehensive analysis of the social, environmental and economic costs and benefits of a project. Dredging is just one facet of an infrastructure project, with its elements functioning as part of a larger network which engages with a surrounding ecosystem. To understand a project's complete set of costs and benefits requires a system-scale view of the infrastructure as well as its provided functions and services. The second measure involves improvements to the dredging process by conserving resources, maximizing efficiency and increasing productivity as well as extending the useful lifespan of assets and infrastructure. Innovations in technology and operational practices can reduce fuel and energy requirements within the dredging process and eventual operation of the infrastructure. All-inclusive stakeholder engagement and partnering is called upon to enhance a project's value. Stakeholder commitment plays an important role in the governance of infrastructure projects. The elevated level of investment and sophistication

employed in the collaborative process directly contributes to the degree of success achieved at every stage.