

# ASPECTS OF MANAGEMENT IN RESERVOIRS SEDIMENTATION

G. ALBERGO\*, F. MESSINA\*\*, L. SARTI\*\*\*, C. CORBAU\*\*\*\* and U. SIMEONI\*\*\*\*

\*Facoltà di Ingegneria, Università degli Studi del Molise, Italy

\*\* Libero professionista

\*\*\* Impresa G. Sarti Giuseppe & C. SpA ([L.sarti@impresasarti.com](mailto:L.sarti@impresasarti.com))

\*\*\*\* Dipartimento di Scienze della Terra, Università degli Studi di Ferrara

## ABSTRACT

Silting of reservoirs is a complex sedimentary process that causes the reduction of the storage capacity. This gradual capacity loss due to sediment accumulation is a global problem, often unavoidable, and has multiple negative impacts (economic, social and environmental).

The significance of the problem requires careful policy management and multidisciplinary management projects as suggested by the article 40 of D.lgs 152/99 and subsequent DM 30/6/2004 and D.lgs. 152/06.

A Project Management must provide answers on the qualitative and quantitative characteristics of the sediment, on the more efficient removal techniques and, above all, on the final destination of the removed material. The national and international laws related to this subject are still incomplete and the interventions carried out were mostly limited to guarantee the functioning of the water intake and dumping manufactory works.

This work aims to provide an integrated approach to the management of lake sediments. The research focused on the dredging operations for removal of the accumulated sediment in the Sabetta reservoir located on Bussento River (Campania, Italy) and especially on the final destination of the sediment. This reservoir, operated only for the generation of hydroelectric power with daily compensation, has a surface of water of about 5 ha and a theoretical capacity of  $4 \cdot 10^5 \text{ m}^3$ . The silting is estimated to be approximately 20% of reservoir capacity. The flyschoid nature of the sides, which form the catchment area, has led to an accumulation of fine to very fine sediments (silt and clay).

Particular importance was given to the possibility to give the sediment a status that is in agreement with the Directive 2006/12/EC and the European Parliament Resolution of 13/2/2007 for major policy of reutilization. In fact, the reuse of the removed material is the only option for a sustainable management of the sediment accumulated on the bottom of a reservoir, also by considering the large quantities to be removed.

In the framework of the project, several options for using the removed material, that resulted uncontaminated from the analysis, have been evaluated. It has also been studied a better compatibility of the removed sediment through treatments essentially based on granulometrical separation and on the reduction of the water content in order to optimize the activities of road transport.

Furthermore, this study aims also to present a possible use of dredged materials for a nourishment intervention along a coastal stretch in Emilia-Romagna in order to favour the natural coastal resilience. The studied area regards the dams located within the 20 Km from the coast on the Conca river, distance that allows the transfer of material through conducts (sand pipelines).

The proposed integrated approach respects the EU directives according to an BATNEEC address (Best Available Technology Not Entailing Excessive Costs), as all technical and economical aspects related to the removal and especially to all sectors, public and private, involved in the process of treatment, transport and final destination of the sediments, have been estimated.