



Sediment management and renewability of floodplain clay for structural ceramics

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The Netherlands have vast resources of clay that are exploited for the fabrication of structural ceramic products such as bricks and roof tiles. The extraction of clay creates land surface lowerings of about 1.5 m, of which the majority are located in the embanked floodplains of the rivers Rhine and Meuse. At these surface lowerings, clay is replenished within several decades. This study explores to which extent the clay can be regarded as a renewable resource, with potential for sustainable use. For this purpose, first the current and past clay consumption is calculated. Subsequently, clay deposition in the floodplains is estimated from literature data on clay accumulation using sediment traps, heavy metal and radionuclide distribution in soil profiles, and from morphological modelling studies. These estimates of clay-deposition and consumption are then compared following three approaches that consider various temporal and spatial scales of clay deposition. This allows us to establish the extent to which man determines sedimentary processes in the Dutch floodplains. Consequently, using the sediment response to the land surface lowering resulting from clay extraction, we explore sediment management options for the Dutch Rhine and Meuse. Altogether we argue that clay has been, probably is, and certainly can be managed as a renewable mineral resource.