A possible solution for the 21st century to reverse the negative impact of dams in the environment. A geological study of sediments from portuguese and brazilian reservoirs

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Dams have largely increased in numbers due to the dependence of many regions on surface-water storage. Although hydroelectricity is one of the less polluting energy sources, dams are a problem to the environment because they represent barriers to the natural sediment transport cycle and they may be responsible for increased euthrophication in rivers downstream. Besides, they are subjected to accelerated sedimentation, which fills the reservoir, causing loss of storage capacity and decreasing the quality of water due to nutrients and metals release from bottom sediments. These sediments result from natural processes and over-erosion in drainage areas. To improve the capacity of the eroded soils for sustained organic productivity, we could use these sediments as additives, because they contain the nutritional elements much needed in soils. We have studied the bottom sediments from 3 reservoirs in South Portugal and 2 reservoirs in Rio Grande do Sul (Brazil), to test their suitability for agricultural use. Related to mineralogical compositional of sources and weathering processes, the 2 groups of reservoirs have large differences on the clay minerals composition and the nature and levels of chemical elements. Portuguese sediments have higher levels of exchangeable and soluble forms of nutritional elements and comparing these results with natural soils, we conclude that they could be good agricultural soils or fertilizers for soils in eroded regions. Despite the lower nutritional levels of the sediments from Brazillian reservoirs, they are nevertheless far higher than the soils collected in their drainage basins.