COULD SALT WATER INTRUSION AND LAND SUBSIDENCE TRIGGER SOIL DESERTIFICATION IN THE CATCHMENT SOUTH OF THE VENICE LAGOON (ITALY) -

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The catchment south of the Venice Lagoon is threatened by shallow aquifer salinization and land subsidence. Although the area is not experiencing everywhere saline contamination and high sinking rates, a very serious situation has been brought to light in a large portion of the coastal farmland. The salt water contamination, recently investigated within a series of research projects, i.e. ISES, BRENTA, Co.Ri.La. 3.10-3.16, extends up to 20 km inland from the coast (Carbognin and Tosi, 2003; Rizzetto et al., 2003; Carbognin et al., 2005, 2005b). The depth of the fresh/salt-water interface varies from 1 to 30 m below the ground level and exhibits a significant, mainly seasonal, time variation. The dynamics of the soil salinization process is especially sensitive to changes in river (Brenta, Bacchiglione, Adige, Gorzone) discharges, in groundwater and channel levels regulated by a number of pumping stations of the reclamation network, and in weather conditions.

At the same time an ongoing land subsidence with rates varying from few mm/yr to cm/yr affects the southern lagoon margin and the nearby watershed (Tosi et al., 2000; Teatini et al., 2007). The settlement of these territories is mainly due to natural consolidation (Teatini et al., 2005) and geochemical subsidence, i.e. peat oxidation promoted by farming activities (Gambolati et al., 2005).

Salt water intrusion and land subsidence combined with significant dry seasons expose this area to the potential soil desertification. The combined effect of both processes is producing an alarming social and environmental impact on the south Venice coastland, also in relation to the expected global climate change.

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References