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INFILTRATION/IRRIGATION TRENCH FOR SUSTAINABLE COASTAL DRAINAGE MANAGEMENT: EMILIA-ROMAGNA (ITALY)

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Abstract

The current trends in Mediterranean climate indicate longer periods of drought and hot temperature in summer and shorter and more intense precipitation in spring and autumn, which require reconsidering the current water management. The Emilia-Romagna coastal area (Northeastern Adriatic Sea, Italy) is entirely drained by a network of channels connected to more than 70 water pumping stations. Although drainage is fundamental in wet periods to keep the land dry, during long periods of stable weather, the fresh portion of drainage water could be reused for irrigation or managed aquifer recharge purposes. The proposed Managed Aquifer Recharge (MAR) project involves the reuse of drainage water towards infiltration trenches for both irrigation and natural infiltration purposes. Four possible locations in the Ravenna area were assessed and recommended for the implementation of drainage/irrigation/infiltration projects. It was estimated that, maintaining a raised level of +0.5 m respect to the current water level, a freshwater recharge of about 0.4 million m^3 could be achieved in 120 days of operation by the combined-use of the trenches (total length of 8200 m). If water level in the trench was maintained at +1 m respect to the current level, the freshwater amount available for the aquifer recharge could reach about 0.7 million m^3. This additional freshwater availability would allow irrigation for over 1500 hectares of land and could increase the agricultural gross marketable production of 50%.

Key words: aquifer, drainage, infiltration, MAR, water management

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