

Damming effects on upstream riparian and aquatic vegetation: the case study of Nazzano (Tiber River, central Italy)



In the Mediterranean region, the majority of watercourses have undergone hydrogeomorphic alterations, mainly due to flow regulation such as damming. Despite this, few investigations analyzing dam impact on upstream river vegetation exist. In this study, we analyzed the temporal vegetation changes occurring along the Tiber River in Nazzano (Rome), as a consequence of the construction of a dam in 1956. We examined which communities are more sensitive to this anthropic alteration of the river ecosystem. An evaluation of how and with what timing these communities varied their extension as a result of such alteration is provided. Moreover, the role of the hydrogeomorphic alterations on the evolution of the river vegetation, linked to the management of this dam as a run-of-the-river impoundment, was analyzed. Our results show the main vegetation changes occurred during the first decades after the dam construction. Indeed, the dam operation caused significant local expansion of the upstream river waters, causing the flooding of most of the surrounding lands, and the formation of new sub-lentic wetlands. The altered hydrogeomorphic conditions favored the development of natural riparian and macrophyte communities typical of lacustrine ecosystems and therefore mostly different from those expected for the analyzed river typology. The changes in extension over time of these vegetation communities highlight their close relation to the alteration of some hydrological parameters especially affecting the river water level.

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