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Hydrological character of the soil of a degraded area: comparison of analysis physical, chemical and floristic vegetational

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This work is an integral part of a project co-financed by the European Union “Environmental recovery of degraded soils and desertified land by a new technology treatment for the recovery of the land" (Life 10 ENV IT 400 "New Life"); this technology is based on a treatment (patented by m.c.m. Ecosistemi) of chemical mechanical processing of degraded soils with an initial process of disgregation of the same followed by their reconstitution incorporating soil matrices, a subsequent polycondensation with humic acids and a final restoration.
The area of intervention of the New Life project lies in the municipal territory of Piacenza, where between the years 70 and 80 has been made a landfill for municipal solid waste with subsequent restoration work by placing a layer of soil cover. The first phase of the New Life project was that of a physical and chemical characterization of different cover soils of the area combined with floristic-vegetational analysis. At this stage the present study aims to compare the data related to the analysis of the vegetation with those returned by investigation of hydrological characteristics of soils performed by laboratory methods, together to confront two theoretical calculation methods for determination of hydrological parameters. The comparison of the ecological study of the vegetation with the outcomes obtained by the classical methods regarding the determination of water retention, allows you to have a picture that is as detailed as possible in describing the characteristics of the substrate. The comparison also with the two methods of calculation, which determines the hydrological character conditions in average soil condition, allows you to ascertain the actual disturbance of the soil in the area.
In order to delineate the hydrological characteristics of the soils sampled, were quantified by the Maximum Water Concentration, the capacity range, the point of Withering by the method of the Tensiometric box and the Pressure Membrane Extractor (Piastre di Richards): were carried out from water retention curves and calculated the values of percolating water (water circulation) and the useful water (maximum available water) were also determined physical and chemical parameters that most affect the hydrological characteristics of the soil such as texture, organic carbon, salinity and total limestone.
The same soils were subjected to a floristic and vegetational analysis with relative comparison of the biological spectrum of the site with the spectra of other territories taken in comparison (Piacenza, Emilia Romagna, northern Italy, southern Italy). The 40% of the plants of the area is represented by Therophytes, species that are adapted to live in environments disturbed by human activities or climate. The high frequency of this species does not seem motivated either by the ombrothermic diagram elaborated with the help of the climatic data of the meteorological station of Piacenza, which was observed for a brief period the appearance of water deficit, neither linked to the interference from human activities which turns out to be low.

Keywords: degraded soils, hydrological character, floristic vegetation analysis