

Agricultural Terrace Pattern Distribution and Preservation along Climatic Gradient

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Agricultural terraces are a well-distributed agrotechnical method for planting in various places in the world, from ancient time and until today. The aim of the current research is to demonstrate the spatial distribution and conservation of agricultural terraces along a climatic gradient of sub-humid Mediterranean, semi-arid and arid climate zones by presenting the case study of the Land of Israel.

In the Judean Mountains (central Israel), a region under sub-humid Mediterranean conditions, agricultural terraces are characterized by terrace coverage on slopes and in valleys. Annual rainfall average in this region is 800 mm, allowing for vast rain-fed agriculture based on direct rain. In the Judean Shephelah (central Israel), a region under semi-arid conditions, agriculture terraces are located in small spots on the slopes, and in terrace fields in the valleys. Annual average rainfall in this region is between 300 and 400 mm. Rain-fed agriculture was sustained by direct rain and additional runoff generated on rock outcrops. In the Negev Highlands, (southern Israel), a region under arid climate conditions with annual rainfall average of 100 mm, runoff farm terraces are located in valleys, and agriculture sustenance was based on water harvesting from the slopes. The terraces pattern distribution is similar to the natural vegetation pattern distribution of the three given areas.

During the past ten of years, changes in land use and farming methods have resulted in the abandonment of many agricultural terraces in the given areas. Terrace abandonment leads to the collapse of retaining walls and erosion of soil and sediments from the terrace body with the latter occurring at a high rate in the arid Negev highlands. However, in the Judean Mountains and the Judean Shephelah, areas under sub-humid Mediterranean and semi-arid conditions, the intensity of erosion is lower since the terraces are covered by dense shrubs such as *Sarcopoterium spinosum* or by trees. This plant cover stabilizes and moderates the soil and sediment erosion. This regional difference shows that the absence of maintenance is more significant in the arid areas, which is more sensitive to erosion while in the more humid areas, dense plant recoverage stabilizes the surface and conserves the soil and sediments within the terrace.

To conclude there are two primarily insights 1: Climate has a dominant effect on agricultural terrace distribution, and ancient farmers knew how to adapt to different climate conditions. 2: The climate conditions have a major effect on the terraces preservation and maintenance.