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Redefining the surface | Petra –Jordan A CASE STUDY

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Ancient city of Petra, one of the cities of the Ma'an governorate, is located approximately 270 km south of Amman, capital of Jordan. It is hard to believe that an arid landscape where the average rainfall is around 180mm would have encouraged humans to settle as early as 4th century B.C. Large settlements and eventually civilizations requiring feeding of a large number of people continued to exist there up to the 8th century A.D. The major source for water are perineal springs that are located in various areas. Petra's settlers had other challenges besides water shortage in the form of a very rugged terrain.

Tectonic movements related to the Jordan Valley Rift System helped shape the morphology of the Petra's surface, leading to the exposure of Cambrian Salib and Um Ishrin sandstone formations, the Ordovician Disi sandstone formation as well as the Createcous Sandstones and limestones at the upper margins of the rift valley. Faults and joints lead to forming natural fissures and gullies that helped channel water and contribute in the various surface erosion processes, creating a thin calcareous soil and silt deposits.

Petra's rainfall falls in bursts and causes flash floods as water flows over steep slopes and narrow channels. In these harsh conditions human ingenuity was revealed by readapting the surface to make use of resources and to control floods. A complex system of terraces were built to work as a whole network to preserve the thin soil cover and insure a better management and use of rain water. These terraces helped to stabilize the soil cover and reduce flooding in the area.

In 2015 a detailed survey of the area 14 Km between the archaeological city of Petra and Beidah was conducted. The survey has showed that ancient people understood the terrain and were able to make better use of resources. Various installations have been erected in the form of wall structures, alternated sometimes with flattened area especially along the wadies (valleys). These structures redefined the surface by preventing erosion along slopes, accumulating erosion deposits along the valley, their function as water accumulators changed the soil chemistry making it more favorable for agriculture thus increasing the bioorganic content of the soil.

The aim of the survey was to document these complex terrace system, classify the various terraces, unravel their various functions and understand the system's mechanism of function, in an aim to restore the system for better use of resources. This paper aims to show the preliminary results of this survey.