



Water Harvesting Using Morphometric Analysis and GIS

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Water Harvesting Using Morphometric Analysis and GIS Techniques:

A case study of Wadi Zaret North West of Libya

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ABSTRACT There is an urgent need to manage and utilize the water Resources in order to comply with the immediate and projected water demand in the study area. Water harvesting is a national priority as water supplies are being depleted by intensive pumping. The Landsat7 ETM images, topographic maps are being used with GIS techniques as a research tools for these mapping requirements in the study area. The topographic data preparation started in delineation the major basin and sub-basins in the study area. The total resulting areas of 45 sub-basins were delineated Strahler's technique is used to map these sub-basins, and resulted in a detailed morphometric analysis. From the results of the morphometric drainage analysis, there is a recent rejuvenation of a mature valley. As a result, the stream has incised its channel especially in third and fourth stream orders, which exhibit sheet erosion and severe headwords erosion progress upstream, and a youthful valley has been formed within the older mature valley. Loss of topsoil can reduce site productivity and increase sediment in our waterways, often producing degradation of water quality and increase sedimentation of the proposed reservoirs. The whole watershed major area was overlaid by drainage pattern and topographic map layers using GIS softwares to divide the whole basin into five major drainage basins and delineate the sub-basins in each region. The total resulting areas of 45 sub-basins were measured. As a result, furthermore, the

whole major basin was overlaid by water precipitation layer using GIS softwares to measure the initial volume of water at each sub-basin. As a result, nested flow-chart relating stream discharge to basin area was developed, and one practical use is that it enables the hydrologist to estimate mean discharge at any point in the system by measuring the watershed area lying above that point. Such knowledge would be essential in designing irrigation diversions in the study area.