

## Remote Sensing and Geographic Information Systems for Identifying Water Catchments Areas in the Northwest Coast of Egypt for Sustainable Agricultural Development

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**Abstract :** Sustainable agricultural development of the desert areas of Egypt under the pressure of irrigation water scarcity is a significant national challenge. Existing water harvesting techniques on the northwest coast of Egypt do not ensure the optimal use of rainfall for agricultural purposes. Basin-scale hydrology potentialities were studied to investigate how available annual rainfall could be used to increase agricultural production. All data related to agricultural production included in the form of geospatial layers. Thematic classification of Sentinel-2 imagery was carried out to produce the land cover and crop maps following the (FAO) system of land cover classification. Contour lines and spot height points were used to create a digital elevation model (DEM). Then, DEM was used to delineate basins, sub-basins, and water outlet points using the Soil and Water Assessment Tool (Arc SWAT). Main soil units of the study area identified from Land Master Plan maps. Climatic data collected from existing official sources. The amount of precipitation, surface water runoff, potential, and actual evapotranspiration for the years (2004 to 2017) shown as results of (Arc SWAT). The land cover map showed that the two tree crops (olive and fig) cover 195.8 km<sup>2</sup> when herbaceous crops (barley and wheat) cover 154 km<sup>2</sup>. The maximum elevation was 250 meters above sea level when the lowest one was 3 meters below sea level. The study area receives a massive variable amount of precipitation; however, water harvesting methods are inappropriate to store water for purposes.

**Keywords :** water catchments, remote sensing, GIS, sustainable agricultural development

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