

ANALYSIS OF MORPHOMETRIC PARAMETERS USING REMOTE-SENSING AND GIS TECHNIQUES TO DEVELOPMENT AND MANAGEMENT OF GROUNDWATER EXPLORATION IN LAGHOUAT REGION, ALGERIA.

ROUIGHI Mustapha^{1,2}, BOUZID-LAGHAA Souad^{1,2}, ROUIGHI Tahar³

roui_mustapha@hotmail.fr

bouzidsouad@yahoo.fr.

taharrouighi@yahoo.fr

¹*Laboratoire Environnement, Eau, Géomécanique et Ouvrages, (LEEGO), Algérie*

²*FGC, Université des sciences et de la technologie Houari Boumediene, USTHB, Algérie*

³*Université Ammar tellidji –Laghouat-, Algérie*

Abstract

In some parts of our country, the main source of water demand satisfaction is groundwater.

In this case, it is necessary to explore it and estimate its quantity and behaviour by using spatial analysis tools such as remote sensing and Geographic Information Systems for implementing the optimal management of water resources.

The applications of hydrologic models in arid regions are faced by shortage in the required data that may not allow for the application of rainfall-runoff models. This is also true for the south of Algeria which receives good amounts of flash floods that occur as a consequence of excessive rainfall which infrequently causing major loss of property and life, Wadi M'zi basin which is located in the south region of Algeria and characterized by extremely arid conditions.

The aim of this study is to investigate the use of the remote sensing and Geographic Information Systems in evaluate a morphometric analysis of the Wadi M'zi basin.

In this study the technique of remote sensing data and GIS were used to describe the morphometric parameters, such as the linear, aerial and relief aspects of the Wadi M'zi basin, were determined using Remote-sensing data of various spatial resolutions, ASTER data were used for preparing DEM, and GIS was used in evaluation of linear, areal and relief aspects of morphometric parameters.

The study demonstrates the integration of satellite remote sensing and GIS was an effective approach for analyzing the watershed boundary, flow accumulation, flow direction, flow length and stream ordering. The values of drainage texture, drainage density and stream frequency indicate that the area has high infiltration rate and low runoff, hence contributing most to the exploration for the groundwater resources.

Moreover, Integration of these two technologies was found to be a powerful tool in describing and analyzing groundwater potential zones in Laghouat region, Algeria.

Keywords: Morphometric, Assessment ,groundwater, Laghouat region ,remote sensing and GIS.