



Monitoring spatial and temporal rainfall distribution by TRMM based methodological approaches, and assessing its advantages, disadvantages, limitations and uncertainties, over El-Qaa Plain, Sinai, Egypt.

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ABSTRACT:

Water resources management particularly in the arid and the semi-arid regions controls life continuity, population growth, and land reclamation. Although ground water represents the only and main source of water in El-Qaa plain, it is recharged by very rare rainfall events. Moreover El-Qaa plain is bounded by only five ground-based stations, which provide a limited quantity of precipitation data. Therefore, for a sustainable ground water management, reliable data about these events are needed. This study evaluate the captured data, and it's efficiency in facilitating the understanding of the rainfall spatial and temporal distribution over the study area. Moreover it is highlighting the captured data limitations and uncertainties. For this purpose we collected; Ground-based data from the Egyptian Meteorological Authority, rainfall TRMM (3B42V7) data, and soil moisture TRMM (LPRM/AMSR2) data; all of them covering three successive events during the period from 2014 to 2016. The analysis of the ground-based data, showed high ability for detecting the number of the rainy days and limited ability for monitoring the rainfall spatial and temporal distribution, due to the data deficiency. The TRMM (3B42V7) data provided more continuous data, which facilitate the understanding of the rainfall distribution, but with some limitations due to the low capturing frequency. The data supported the creation of spatial rainfall distribution maps, for the three mentioned events. The TRMM (LPRM/AMSR2) data supported the results of rainfall data, by clearing the soil moisture percentage changes; during, before, and after each event. Three soil moisture differences maps were created, by the using of (LPRM/AMSR2) data. Although the ground-based data has been combined with the TRMM data for a better clarity, the data reliability is still questionable. As a conclusion the extension of the ground-based stations network over the different elevations is recommended in El-Qaa plain.