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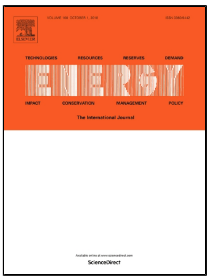

Geospatial characteristics investigation of suitable areas for photovoltaic water pumping erections, in the southern region of Ghardaia, Algeria

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Geospatial characteristics investigation of suitable areas for photovoltaic water pumping erections, in the southern region of Ghardaia, Algeria

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Abstract: During the on-site operation, the PV water pumping system can be faced different unexpected troubles, although the accurate sizing and the fit erection. Recently, different studies showed that the lack of enough information about the geospatial characteristics of the area, required during the sizing of a Photovoltaic Water Pumping System (PVWPS) is the main cause. In this attempt, an investigation study on geospatial characteristics has been conducted, in the Mansoura desert region; about 70 km south of Ghardaia headquarter. The main goal was to spotlight on different suitable locations for implementing PVWPS. The study has been carried out on six zones; namely: Ain Losseik, Old Mansoura, New Mansoura, Oued Ghazalat, Khanget-fedj and Zawiat Lacheikh. The evaluation consists on census and classifying the wells or boreholes according to the geographical location, the water source behavior, the soil specifics, agriculture and ranching activity, type of the crops, etc... It has been averred that the renewable aquifer levels vary between the averages of 20 and 45 m. However, the Albian borehole static levels can be reached between the averages of 3 and 8 m. The aquifer hydraulic behavior has been achieved by calculation of hydrogeology properties. Thus, the obtained data were compared and classified, whereas the suitable DC pumps were selected, accordingly. This method can be used to detect the different local geospatial effects influencing the system operation. Furthermore, it can be considered as a key point subject that could be extended, in future works.

Keywords: on-site operating, geospatial characteristics, feasibility study, suitable location, PVWPS erections

1. Introduction

1.1 Drawbacks and objectives

Algerian's southern part enjoys with high solar potential availability and great groundwater source, in particular in the Ghardaia desert basin. However, these areas being socially and economically unexploitable, due to tremendous drawbacks. The water supply constitutes the main drawback for sustainable development, since the majority of the water sources are located far away from the main electrical grid. Moreover, the adopted method to extract water from