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Identification of suitable sites for aquifer recharge in Moura region (southern Portugal)

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Abstract Recent research found a decrease in the recharge of the karstic Moura-Ficalho (MF) aquifer and called for further research on appropriate mitigation strategies to reverse desertification. This research identifies areas where natural recharge has occurred within the MF aquifer and where recharge could be increased through Managed Aquifer Recharge (MAR) techniques. Topographic maps and hydraulic heads were constructed using Geographic Information System (Arc GIS) software to identify sites with sufficient ground storage space for artificial recharges. Data analysis found the northern, western, and eastern margins of the Moura region unsuitable for recharge due to impermeable layers, insufficient groundwater storage space, and insufficient water resources. The central region of the MF was also unsuitable as the groundwater and hydraulic potential throughout the aquifer could not be increased. The southern margin was shown to be most suitable for groundwater recharge as it had adequate groundwater storage space and an available water supply.

Key words Moura-Ficalho (MF) aquifer system; sink holes; natural recharge; Managed Aquifer Recharge (MAR); Geographic Information System (Arc GIS)