Delineation of Potential Groundwater Zones (GWPZ) in a semi-arid basin through remote sensing, GIS and AHP approaches

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Table S1. Parameters selected in other studies for the determination of Groundwater Potential Zones (GWPZ's)

Study	Parameters selected
Jaiswal et al. (2003) [1]	Lithology, landforms, soil, land use/land cover, lineaments, surface water bodies, drainage density and slope
Suganthi et al. (2013) [2]	Geology, geomorphology, soil, lineament density, rainfall, drainage density, land use/land cover
Manap et al. (2013) [3]	Lithology, slope, lineament, land use/land cover, soil, rainfall, drainage density, elevation and geomorphology
Rajaveni et al. (2017) [4]	Slope, Drainage density, geology, lineament density, geomorphology and land use
Arulbalaji et al. (2019) [5]	Geology, geomorphology, land use/land cover, lineament density, drainage density, rainfall, soil, slope, roughness, topographic wetness index, topographic position Index and curvature
Rejith et al. (2019) [6]	Slope, drainage density, lineament density, land use, curvature, geology, geomorphology, soil and rainfall
Roy et al. (2020) [7]	Geomorphology, slope, lineament density, drainage density, land use/land cover
Saranya & Saravanan (2020) [8]	Geomorphology, Drainage density, lineament density, slope, geology, soil, land use/land cover, rainfall, elevation
Abdelouhed et al. (2021) [9]	Lineament density, drainage density, rock type, slope, precipitation, land use and Topographic Moisture Index (TWI)
Doke et al. (2021) [10]	Geology, distance from river, geomorphology, slope, land use, drainage density, lineament density, soil and rainfall
Al-Djazouli et al. (2021) [11]	Rainfall, slope, land use/land cover, drainage density, lineament density, and lithology
Makonyo & Msabi (2021) [12]	Lithology, slopes, land use/land cover, soil types, drainage density, geological lineament density, flow accumulation, and topographic wetness index (TWI)
Kom et al. (2022) [13]	Geomorphology, geology, lineament density, land use, soil, drainage density, rainfall, slope, curvature and Topographic Wetness Index (TWI)

Melese and Belay (2022) [14]	Drainage density, lineament density, slope, land use land cover, soil, rainfall, geology and topographic wetness index (TWI)
Ifediegwu (2022) [15]	Geology, rainfall, geomorphology, slope, drainage density, soil, land use/land cover, lineament density
Khan et al. (2022) [16]	Geomorphology, geology, lineaments density, slope, drainage density, and rainfall
Kumar et al. (2022) [17]	Lithology, soil, slope, geology, rainfall, drainage density, and land use/land cover
Masoud et al. (2022) [18]	Hydraulic conductivity, distance from the Lake, lineament density, surface lithology, slope, topography, drainage density, and depth to groundwater

Table S1 (Continued)

Table S2. Slope (degree) classification based on the SOTER model (Van Engelen and Wen, 1995) [19]

Slope (º)	Description	Groundwater Potential
<2	Flat	Very high
2-8	Undulating	High
8-15	Rolling	Moderate
15-30	Moderately steep	Low
>30	Steep	Very low

Table S3. Calculation matrix for $\lambda\, max$

Variable	Geology	Slope	LD	DD	Rainfall	LULC	TWI	Weight sum value	Variable weight	$\boldsymbol{\lambda}$
Geology	0.366	0.466	0.437	0.436	0.533	0.356	0.234	2.827	0.366	**7.728**
Slope	0.183	0.233	0.437	0.218	0.304	0.223	0.208	1.805	0.233	**7.753**
Lineament Density	0.122	0.078	0.146	0.218	0.381	0.134	0.104	1.181	0.146	**8.117**
Drainage Density	0.091	0.116	0.073	0.109	0.228	0.134	0.104	0.856	0.109	**7.841**
Rainfall	0.052	0.058	0.029	0.036	0.076	0.178	0.130	0.560	0.076	**7.356**
LULC	0.046	0.047	0.049	0.036	0.019	0.045	0.078	0.319	0.045	**7.159**
TWI	0.041	0.029	0.036	0.027	0.015	0.015	0.026	0.189	0.026	**7.296**

$\lambda\, max$= 7.607

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