SUPPLEMENTARY MATERIAL

Assessing the impact of the Yarmouk Forest Reserve fire on digital natural indices

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Table S1. Mathematical equations utilised in study

Index	Equation	Source
Normalised difference vegetation index	$NDVI = \frac{B5-B4}{B5+B4}$ (1) where: $B4$ = red band, $B5$ = near-infrared (NIR) band	Hartoyo *et al.* (2021)
Soil adjusted vegetation index	$SAVI = (\frac{B5-B4}{B5+B4+0.5}) \cdot (0.5 + 1)$ (2)	Solymosi, Kövér and Romvári (2019)
Transformed vegetation index	$TVI2 = \frac{NDVI+0.5}{\lvert NDVI+0.5\rvert} \cdot \sqrt{\lvert NDVI + 0.5\rvert}$ (3)	Solymosi, Kövér and Romvári (2019)
Top of atmospheric spectral radiance	$L\lambda = ML \cdot Q_{cal} + AL - O_i$ (4) where: $L\lambda$ = the radiation values above the atmosphere, ML = the multiplier rescaling factor, with a value of 3.34 for the 10th band of Landsat 8, Q_{cal} = the calibrated digital number (DN) value for the 10th band, representing thermal values for all cells, AL = the additive rescaling factor, with a value of 0.1 for the 10th band in Landsat 8, O_i = the fixed correction factor for the 10th band in Landsat 8 imagery, equal to 0.29;	Tajudian *et al.* (2021)
Brightness temperature	$BT = (K2 / (\ln (K1 / L) + 1)) - 273.15$ (5) where: BT = brightness temperature (°C), $K2$ = thermal conversion constant associated with band 10 of the Landsat 8 satellite, with a value of 1321.0789, ln = natural logarithm function, $K1$ = thermal conversion constant corresponding to band 10 of the Landsat 8 satellite, with a value of 774.8853, L = spectral radiance at the sensor's aperture, derived from the previous equation;	Tajudian *et al.* (2021)
Proportion of vegetation	$Pv = ((NDVI - NDVI_{min}) / (NDVI_{max} - NDVI_{min}))^2$ (6)	Tajudian *et al.* (2021)
Land surface emissivity	$£ = 0.004 \cdot Pv + 0.986$ (7)	Tajudian *et al.* (2021)
Land surface temperature index	$LST = (BT / (1 + (0.00115 \cdot BT / 1.4388 \cdot \ln (£)))$ (8) the equation to determine the radiation value above the atmosphere is as shown in Equation (4); the second equation employed is the brightness temperature equation, expressed as shown in Equation (5); the constant value of 273.15 is utilised to convert the temperature from Kelvin to Celsius; the $NDVI$ equation was integrated into the vegetation ratio calculation equation; this integration was performed while considering the minimum ($NDVI_{min}$) and maximum ($NDVI_{max}$) $NDVI$ values within the study area; the resulting equation is expressed as shown in Equation (6); following this, the surface emissivity (£) was calculated using the emission equation, which accounts for the proportion of vegetation cover, as shown in Equation (7)	Tajudian *et al.* (2021)
Modified bare land index	$MBI = \frac{B6-B7-B5}{B6+B7+B5} + F$ (9) where: $B6$, $B7$ = SWIR1 and SWIR2 bands, respectively, F = coefficient with a value of 0.5, introduced to redistribute index values with both positive and negative ranges, thereby facilitating the categorisation of land cover values and accurately determining the threshold for bare land	Nguyen *et al.* (2021)
Normalised burn ratio index	$NBRI = \frac{B5-B7}{B5+B7}$ (10)	Khoirunisa and Laszlo (2020)

Source: own elaboration based on the literature.