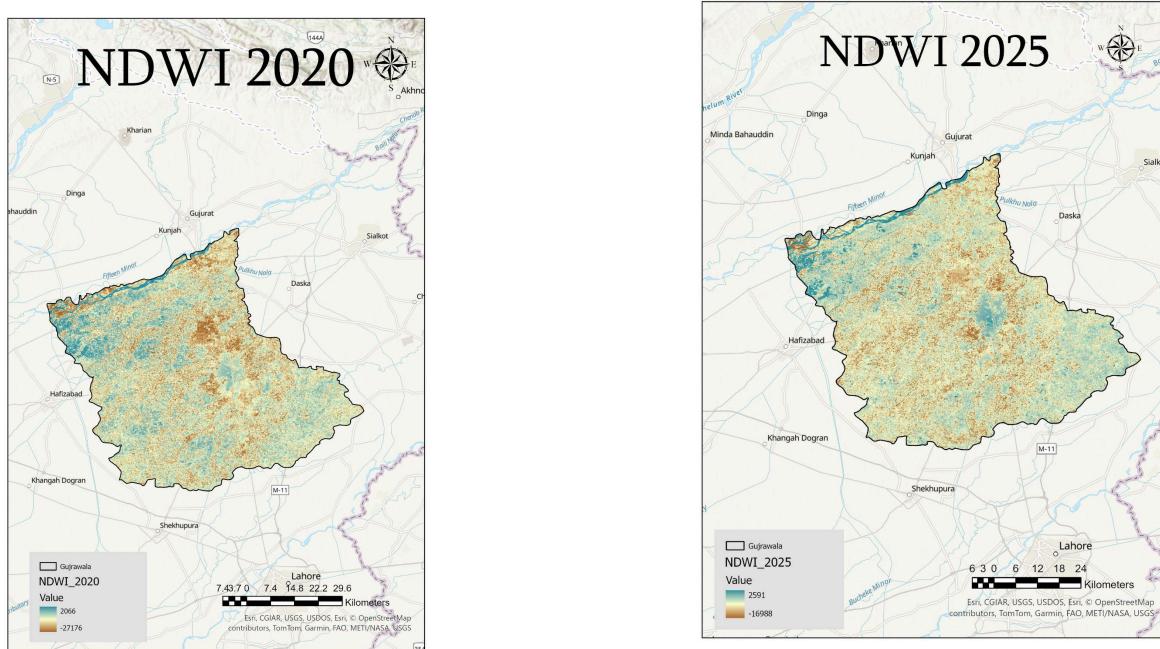


# DIGITAL IMAGE PROCESSING

## ASSIGNMENT 4



### Comparative Analysis of NDWI and Water Body Changes (2020–2025)

The comparative analysis of the Normalized Difference Water Index (NDWI) for the selected area reveals distinct hydrological changes between the years 2020 and 2025. In the baseline imagery from June 22, 2020, derived from Landsat 8 data, the NDWI values ranged from a minimum of -27,176 to a maximum of 2,066, reflecting a moderate distribution of moisture scattered across the region. In contrast, the imagery from June 13, 2025, derived from Landsat 9 data, shows a notable shift in spectral response, with the maximum NDWI value rising to 2,591 and the minimum value adjusting to -16,988. This increase in the maximum index value provides quantitative evidence of change, indicating that water bodies and soil moisture were more saturated or spectrally distinct in 2025 compared to 2020. Visually, this is represented by the

intensified blue clusters in the central and northern sections of the 2025 map, suggesting a higher volume of surface water or intensified agricultural irrigation (likely for rice cultivation) during this period relative to five years prior.

**Name:** Syeda Minha Tirmizi

**Enrollment Number:** 02-138231-006

**Program:** BS ( Remote Sensing & GIS)-6(A)