

**Prediction modelling of Land Use/Land Cover  
changes and its impact on Urban Heat Island  
intensity over the Greater Kovai Region: A  
Geomatics Approach**



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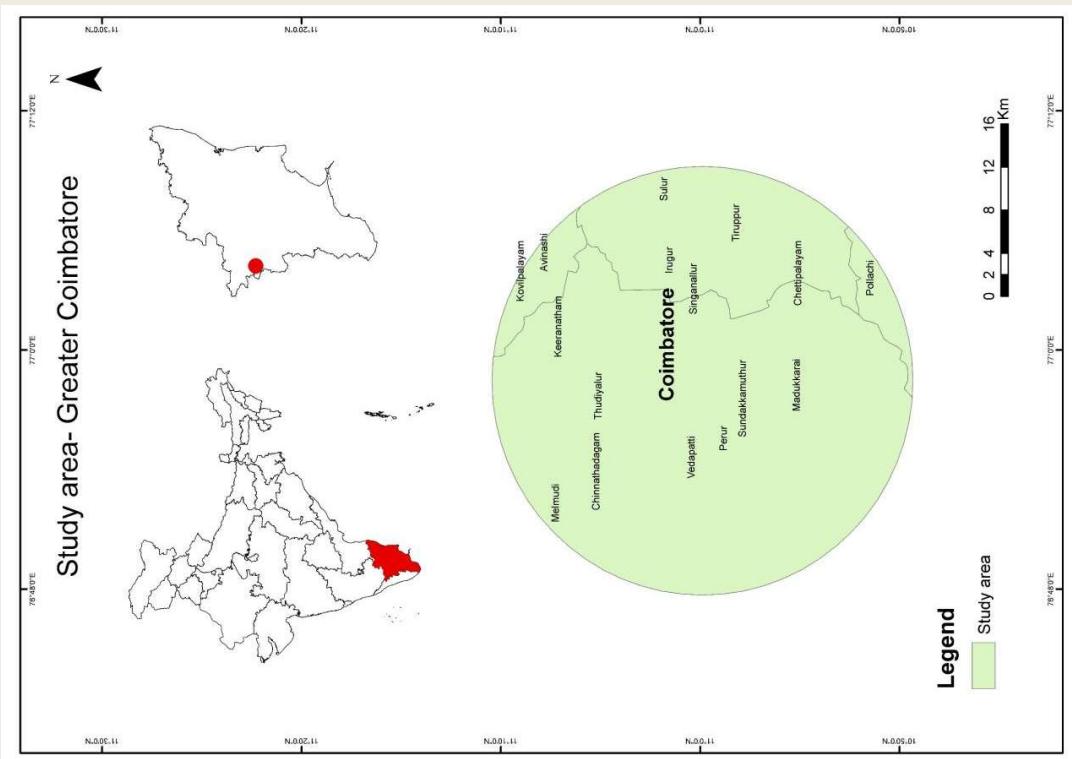
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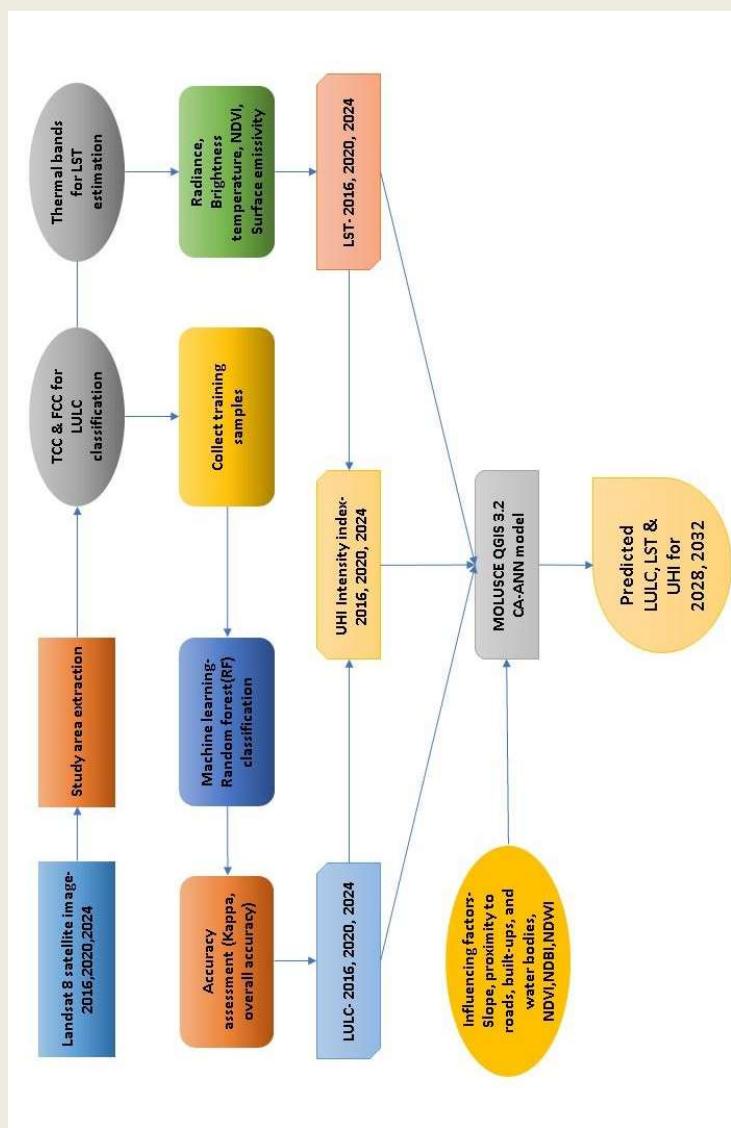
**Hydrology and Climatology Research Group**

**KSCSTE-Centre for Water Resources**

**Development and Management**



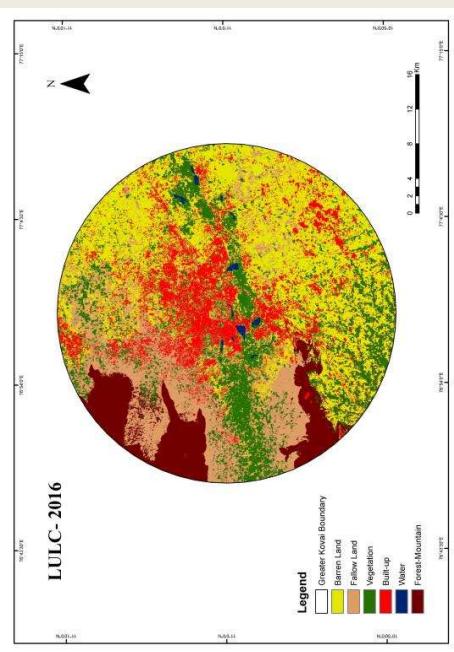
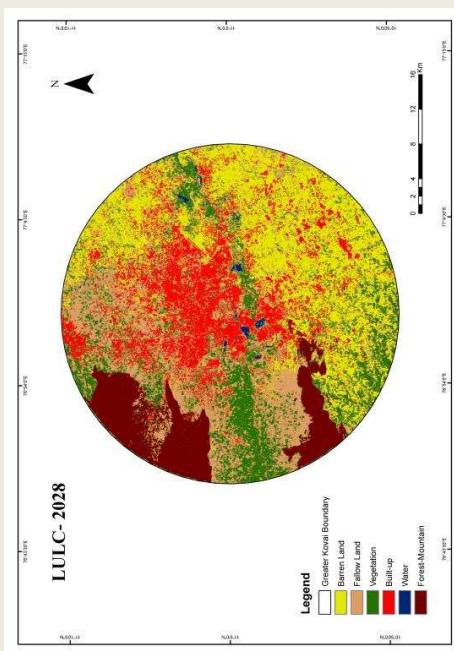
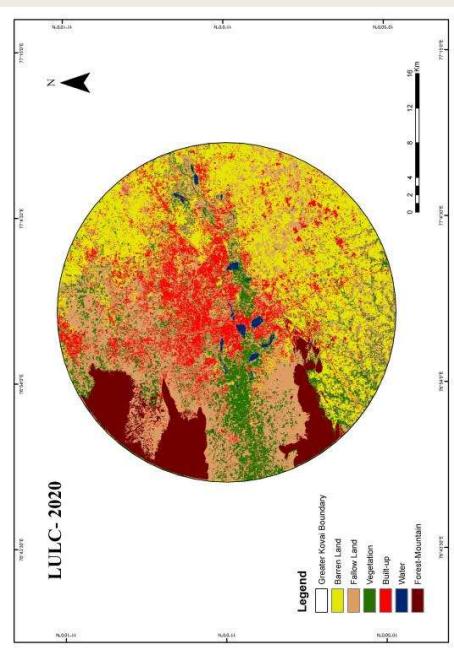
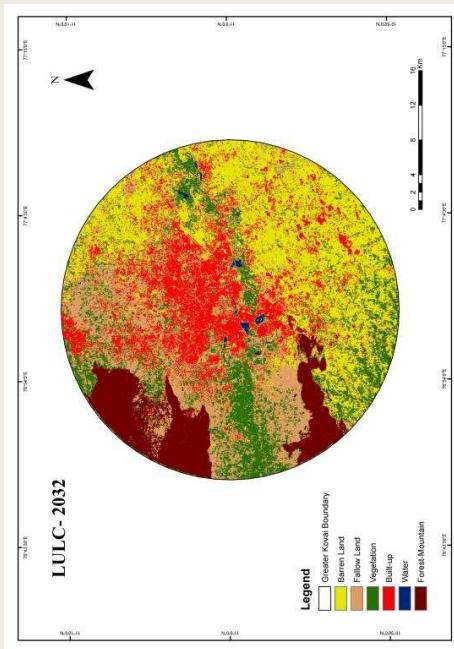
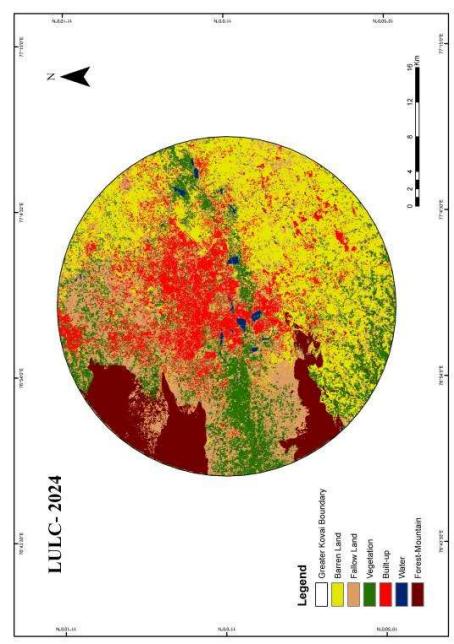
# METHODOLOGY



# RESULTS

- Accuracy assessment of LULC

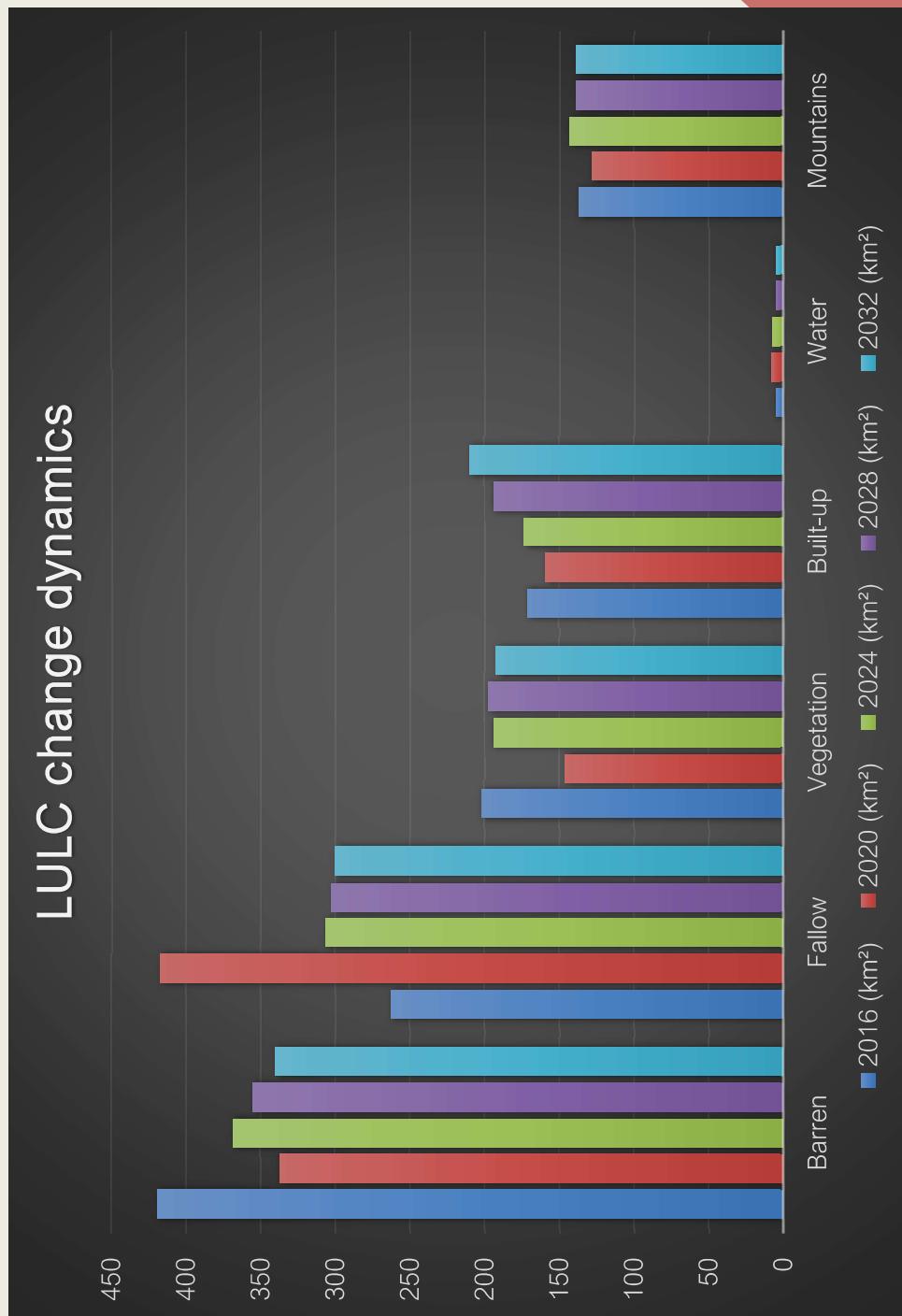
| Time | Overall accuracy | Kappa coefficient |
|------|------------------|-------------------|
| 2016 | 88%              | 0.91              |
| 2020 | 90%              | 0.87              |
| 2024 | 83%              | 0.81              |

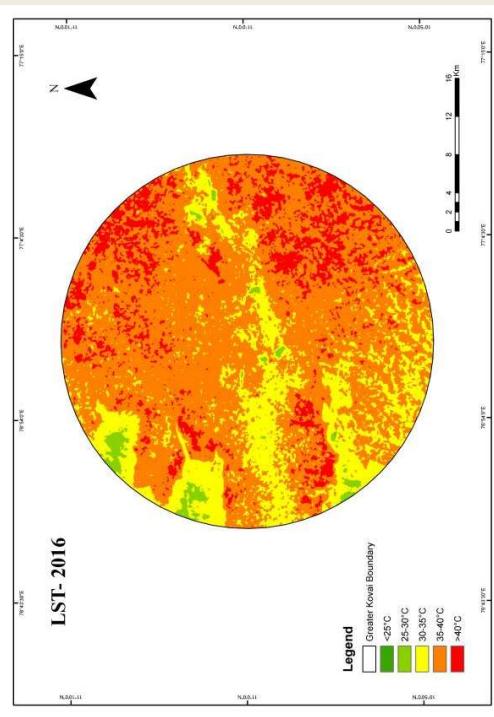
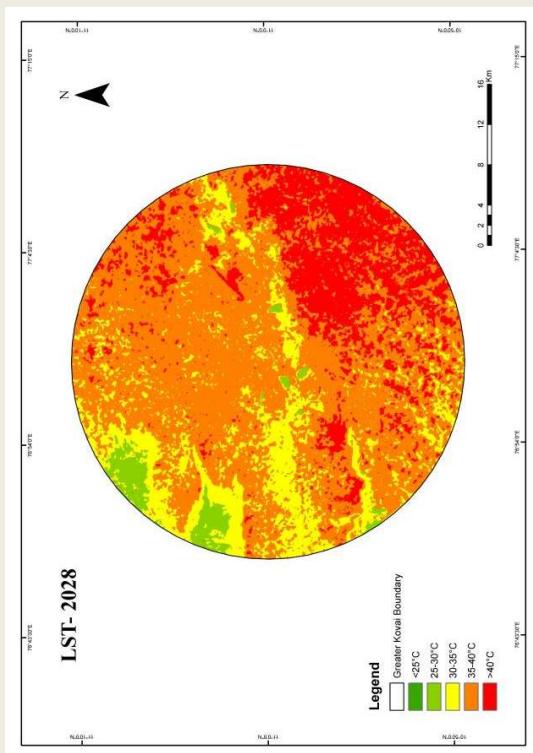
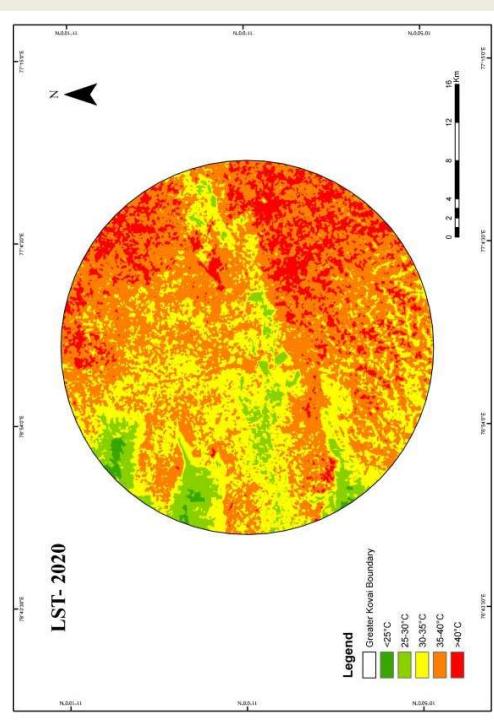
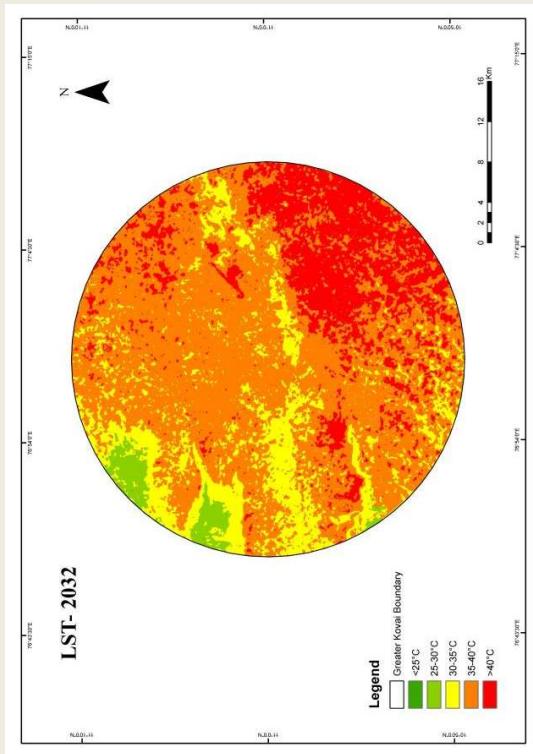
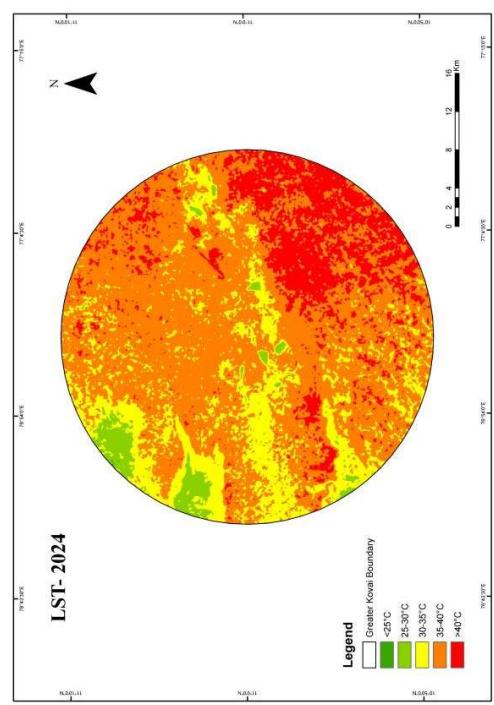


# RESULTS

- LULC Trend: 2016 - 2032

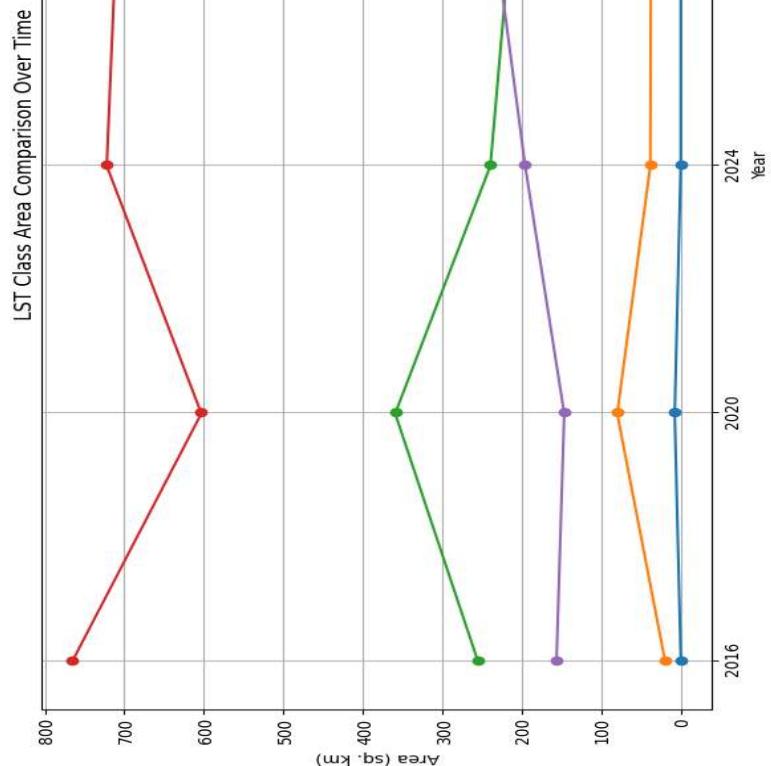
LULC change dynamics

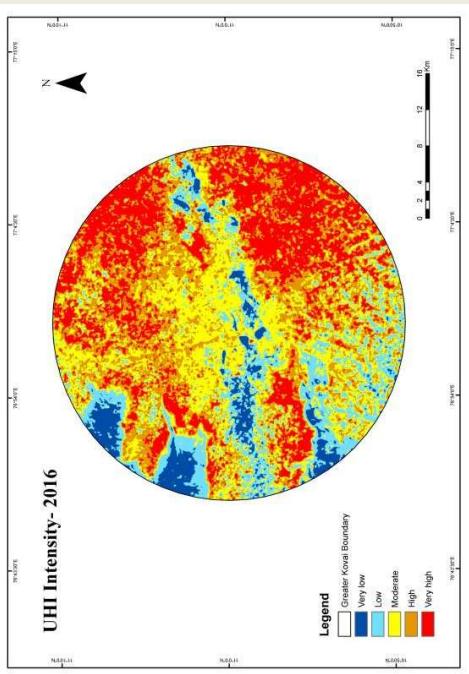
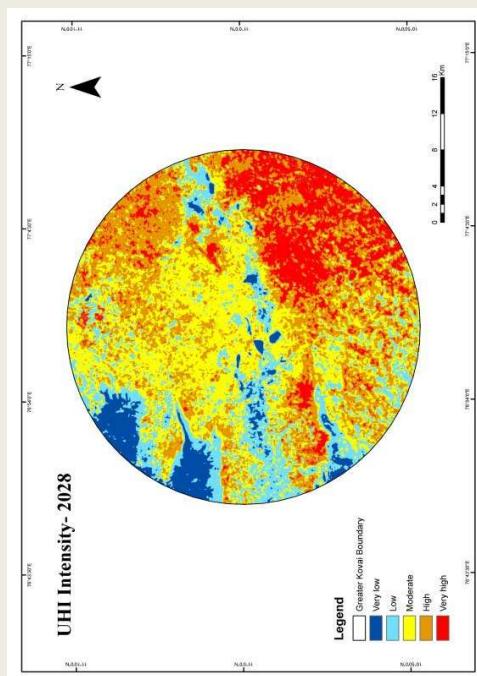
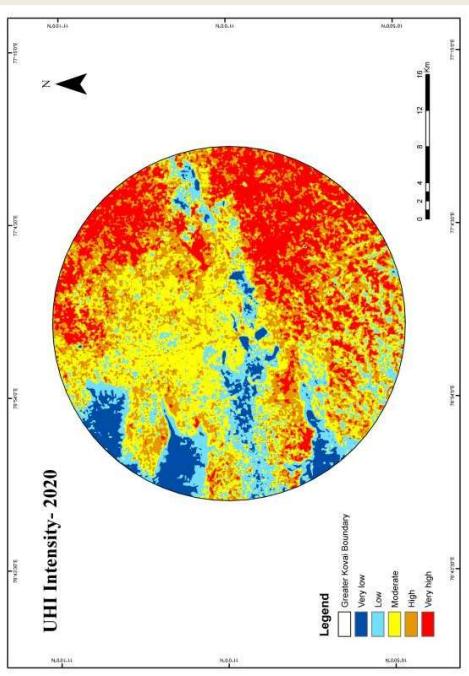
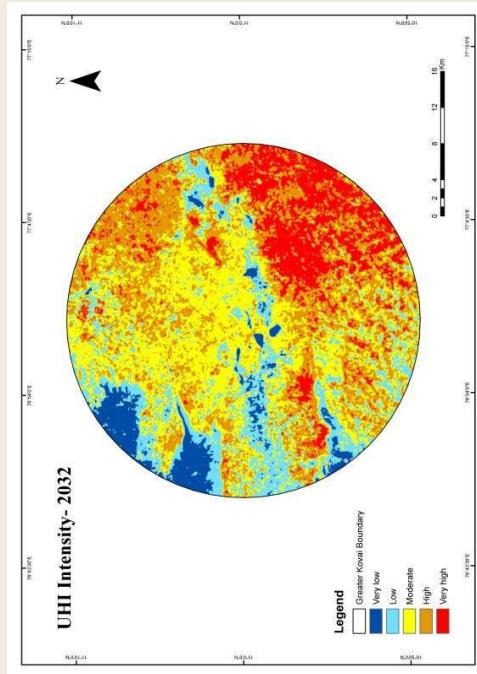
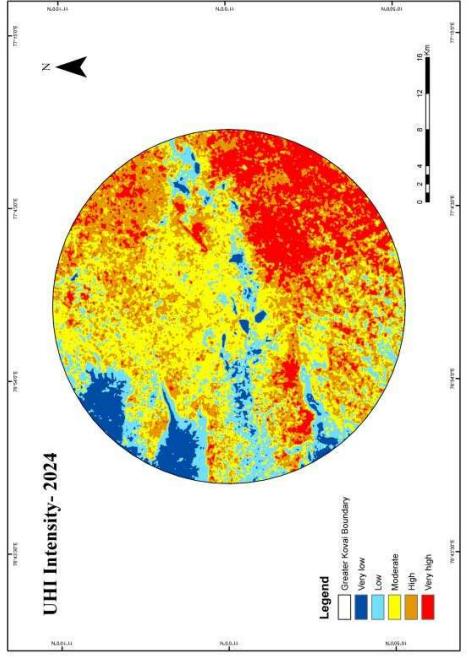




## LST Distribution:

| Year | <25°C  | 25-30°C | 30-35°C  | 35-40°C  | >40°C    |
|------|--------|---------|----------|----------|----------|
| 2016 | 0.0153 | 19.8432 | 255.2994 | 765.4383 | 156.465  |
| 2020 | 7.74   | 80.0757 | 359.3538 | 603.1683 | 146.7162 |
| 2024 | 0.1431 | 38.43   | 239.6142 | 722.1708 | 195.8697 |
| 2028 | 0.0828 | 37.5696 | 212.4999 | 709.0632 | 237.0123 |
| 2032 | 0.0828 | 33.444  | 211.4163 | 715.392  | 235.8927 |





# RESULTS

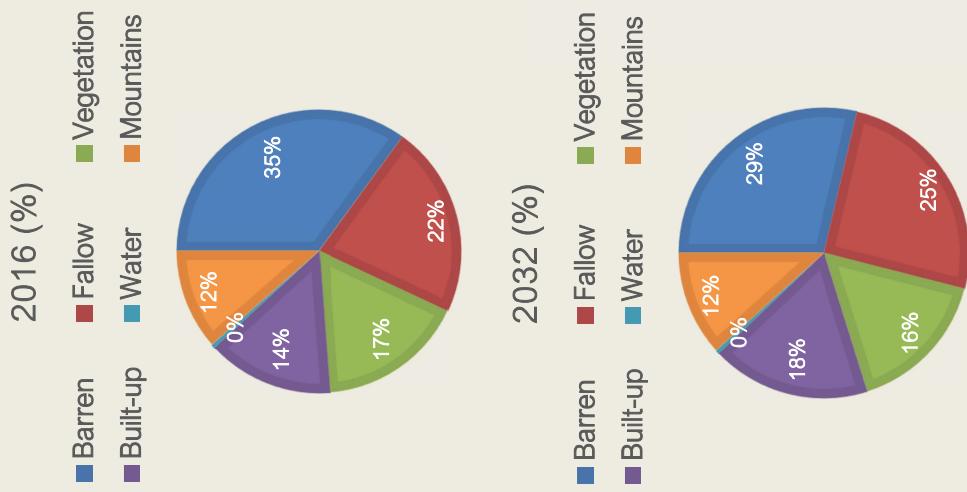
- UHI Intensity distribution: 2016 – 2032

| Year | Very Low (Sq. km) | Low (Sq. km) | Moderate (Sq. km) | High (Sq. km) | Very High (Sq. km) |
|------|-------------------|--------------|-------------------|---------------|--------------------|
| 2016 | 67.1022           | 176.0184     | 315.2844          | 341.6886      | 296.9676           |
| 2020 | 78.0759           | 171.8523     | 354.2301          | 329.544       | 263.3517           |
| 2024 | 67.5414           | 172.9881     | 400.0716          | 354.2166      | 201.4101           |
| 2028 | 67.4469           | 197.6058     | 374.8059          | 386.8191      | 169.5501           |
| 2032 | 67.437            | 197.55       | 374.8014          | 387.4401      | 168.9993           |

# DISCUSSION

## • LULC Comparison

| Class      | 2016 (%) | 2032 (%) |
|------------|----------|----------|
| Barren     | 35       | 28.49    |
| Fallow     | 21.95    | 25.14    |
| Vegetation | 16.87    | 16.09    |
| Built-up   | 14.3     | 17.6     |
| Water      | 0.43     | 0.44     |
| Mountain   | 11.45    | 11.6     |



# RESULTS

- LST- Inference

AREA  $\leq 35^{\circ}\text{C}$



AREA  $\geq 35^{\circ}\text{C}$



# SUMMARY

- The urban areas increased from 14 % to almost 18%, a 4% increase.
- Fallow lands also increased from 22% to 25%.
- Barren Lands, from 35% in 2016 to 29% in 2032.
- The area under the  $>40^{\circ}\text{C}$  increased from 156 sq. km to 235 sq. km in 2016 to 2032
  - UHI Intensity: 2016- 2032
    - Low: +12.23%
    - Moderate: +18.88%
    - High: +13.39%