**Night Light Usage Trends in Meherpur District**

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Executive Summary

This study analyzes the temporal variation in night light usage in Meherpur district from 2013 to 2024, using satellite-based nightlight intensity data. The analysis categorizes illuminated areas into three classes: high, medium, and low, reflecting changes in urbanization, electrification, and infrastructure development. The results indicate a declining trend in low-light areas, with a simultaneous increase in medium- and high-light intensity regions. These trends suggest urban expansion, improved infrastructure, and economic growth in the district. The findings have significant implications for regional development planning, resource allocation, and sustainable urban management.

**Introduction**

This report analyzes the trends in night light usage in Meherpur district over the period from 2012 to 2024. The graph categorizes night light intensity into three groups: high, medium, and low, measured in terms of area (hectares) under each category. Night light data is often used as a proxy for economic activity, urban expansion, and changes in land use patterns.

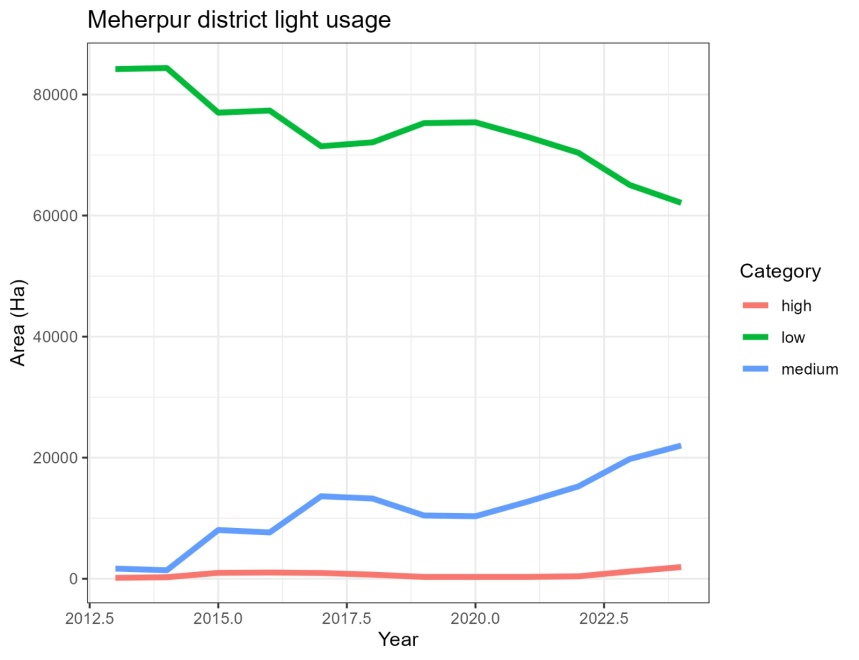


Fig. Showing the trend of night light in Meherpur district

**Key Observations**

**Low Light Area (Green Line):** The area under low light conditions has been significantly higher compared to other categories throughout the period. A gradual decline in low-light area is observed from around 2013 onward, indicating a possible shift towards more illuminated regions. The area fell from approximately 85,000 hectares in 2013 to about 65,000 hectares in 2024, suggesting urbanization or increased electrification in some regions.

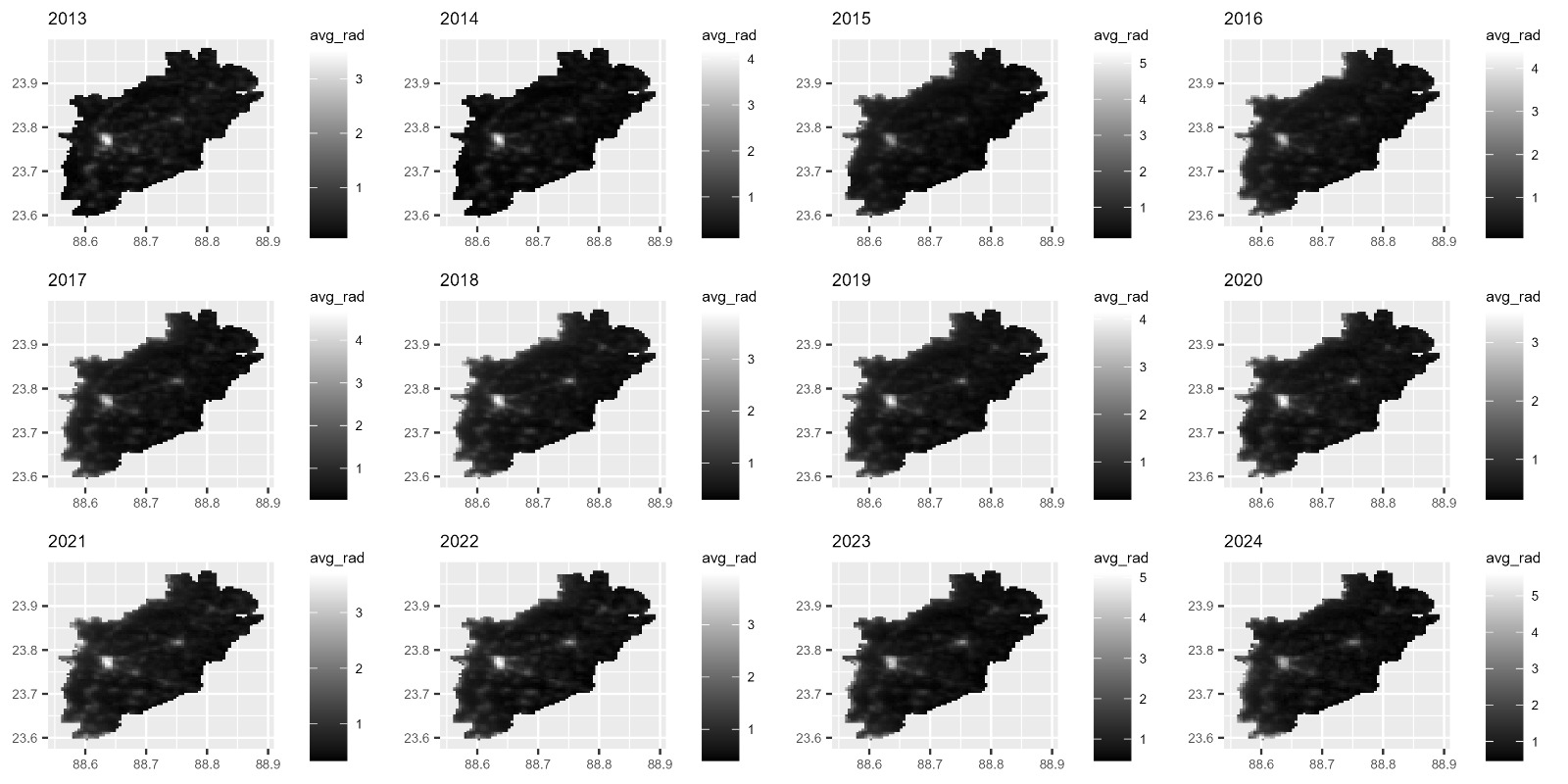


Fig. Showing the spatial temporal status of night light

**Medium Light Area (Blue Line):** The area classified as medium light has shown an increasing trend over the years. From nearly zero hectares in 2013, medium-light coverage has risen to over 20,000 hectares in 2024. The growth is particularly noticeable from 2015 onwards, indicating improved infrastructure, urban expansion, or industrial development.

**High Light Area (Red Line):** The high light area remains the smallest proportion compared to other categories. However, there is a gradual increase in this category, suggesting that certain areas within the district are experiencing higher night-time illumination, potentially due to urban centers or industrial zones. The increase is most visible after 2020, reflecting potential growth in economic activities.

**Interpretation and Implications:**

The overall decline in low light areas and rise in medium and high light areas suggest an increase in electrification, urbanization, and economic activities.

This could be correlated with infrastructure development, industrial expansion, and improved living standards in Meherpur district.

The increase in medium and high light areas may indicate expanding road networks, commercial establishments, and population growth.

The trend may also reflect increased adoption of technology and energy consumption, with implications for regional development planning and sustainability.

**Conclusion**

The night light data from Meherpur district shows a clear trend of increasing illumination, with a significant shift from low light to medium and high light areas over the past decade. This suggests a positive trajectory in terms of urbanization, economic activity, and infrastructure development. Further analysis could explore the correlation between these trends and socio-economic indicators such as GDP growth, population changes, and industrial development.

