

Airshed-Based Source Apportionment of Delhi Air Pollution Using WRF-Chem and Back Trajectory Analysis

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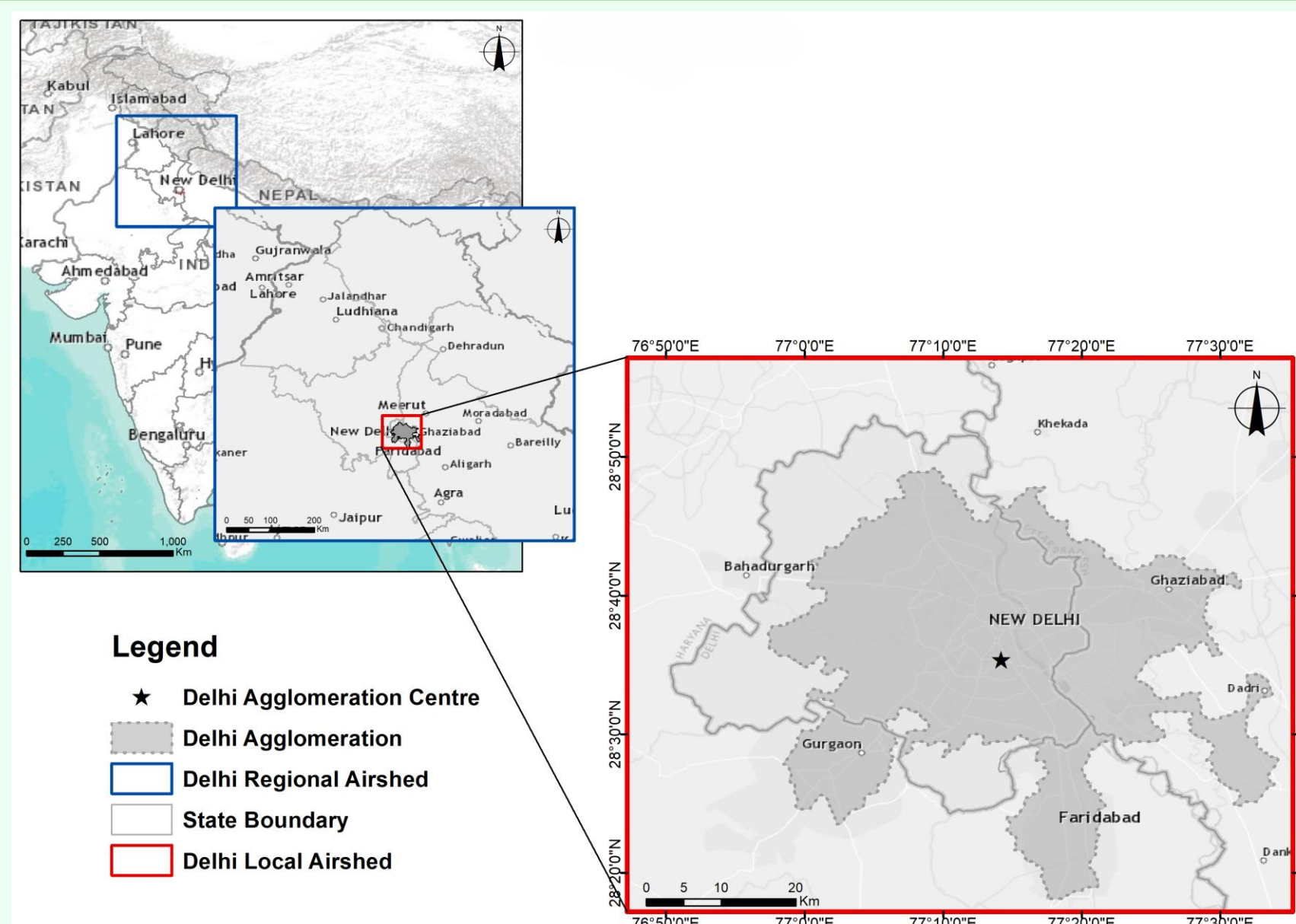
I. PROBLEM STATEMENT

- Delhi, experience severe levels of particulate matter and other pollutants. The area's relatively enclosed nature results in a gradual internal temperature change. Additionally, the transport capacity within the planetary boundary layer (PBL) is limited, leading to temperature inversion and frequent stagnation of local air, hindering the dispersion of air pollutants. Addressing this issue requires collaborative efforts from policymakers at the local, national, and regional levels.
- Air pollution is not limited to administrative boundaries, but it is a transboundary phenomenon which transports pollutants from long-ranges to Delhi. So, it is important to identify the sources & extent of their contribution to various pollutants for more targeted and context-specific decision-making. Authorities can implement measures tailored to the specific sources influencing air quality within that region and in the airshed.
- Previously done source apportionment studies mainly focused on the PM_{2.5} and PM₁₀ and did not consider the airshed but this study does and focus on CO, NO₂ and PM_{2.5}.

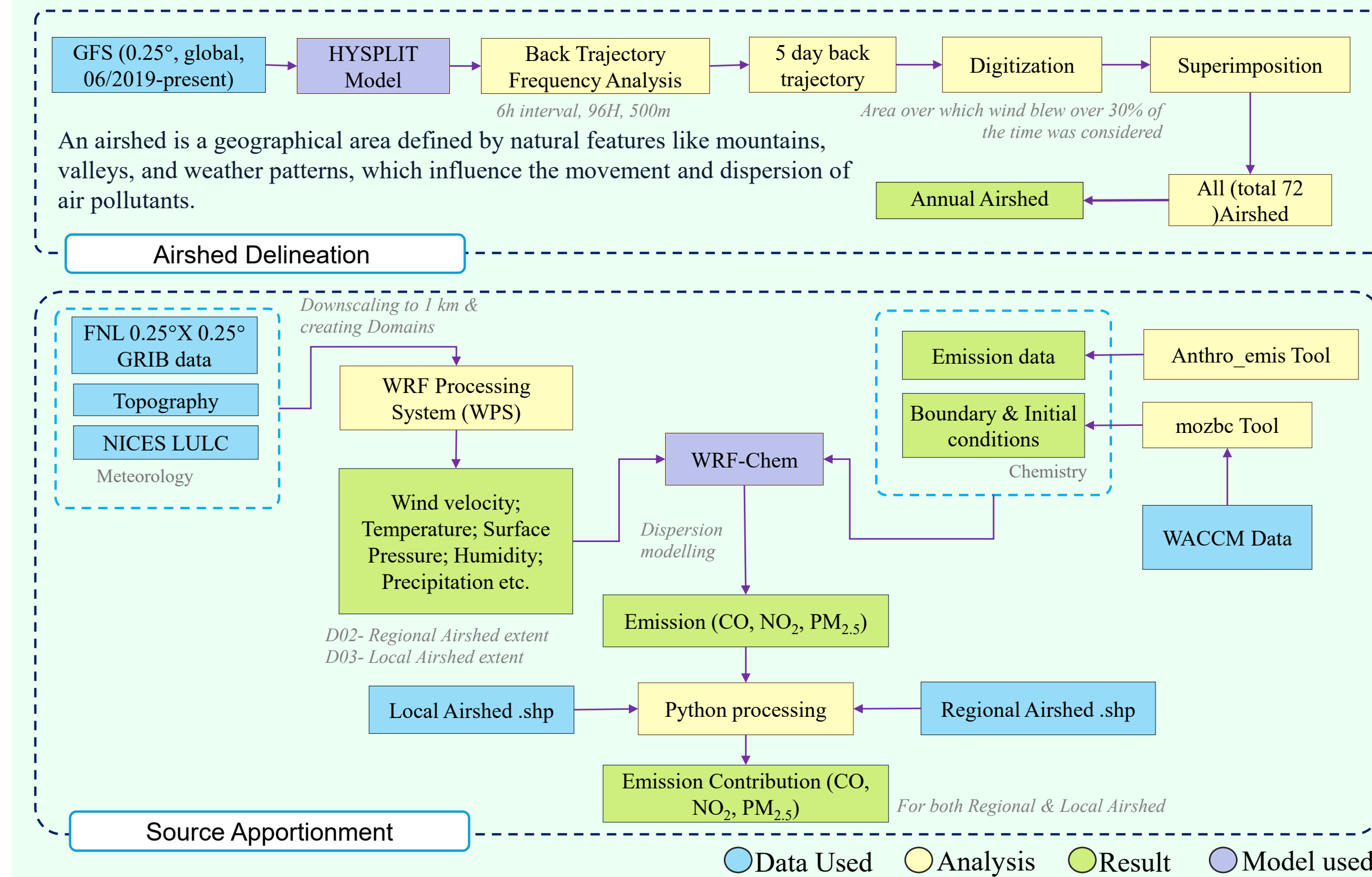
II. OBJECTIVES

- To find local and regional airshed for Delhi
- To find the contribution of different sectors for CO, NO₂ and PM_{2.5} in the airsheds.

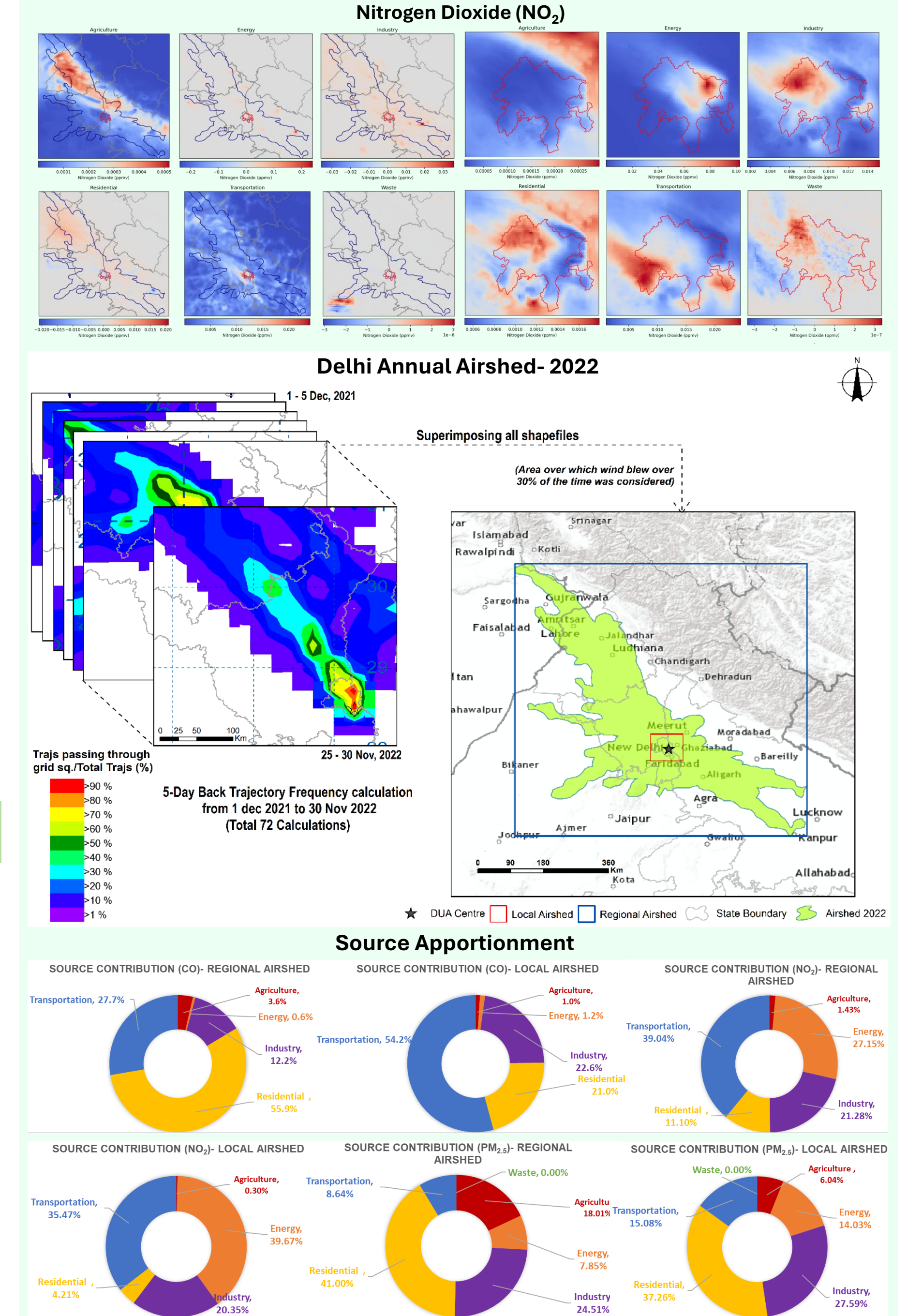
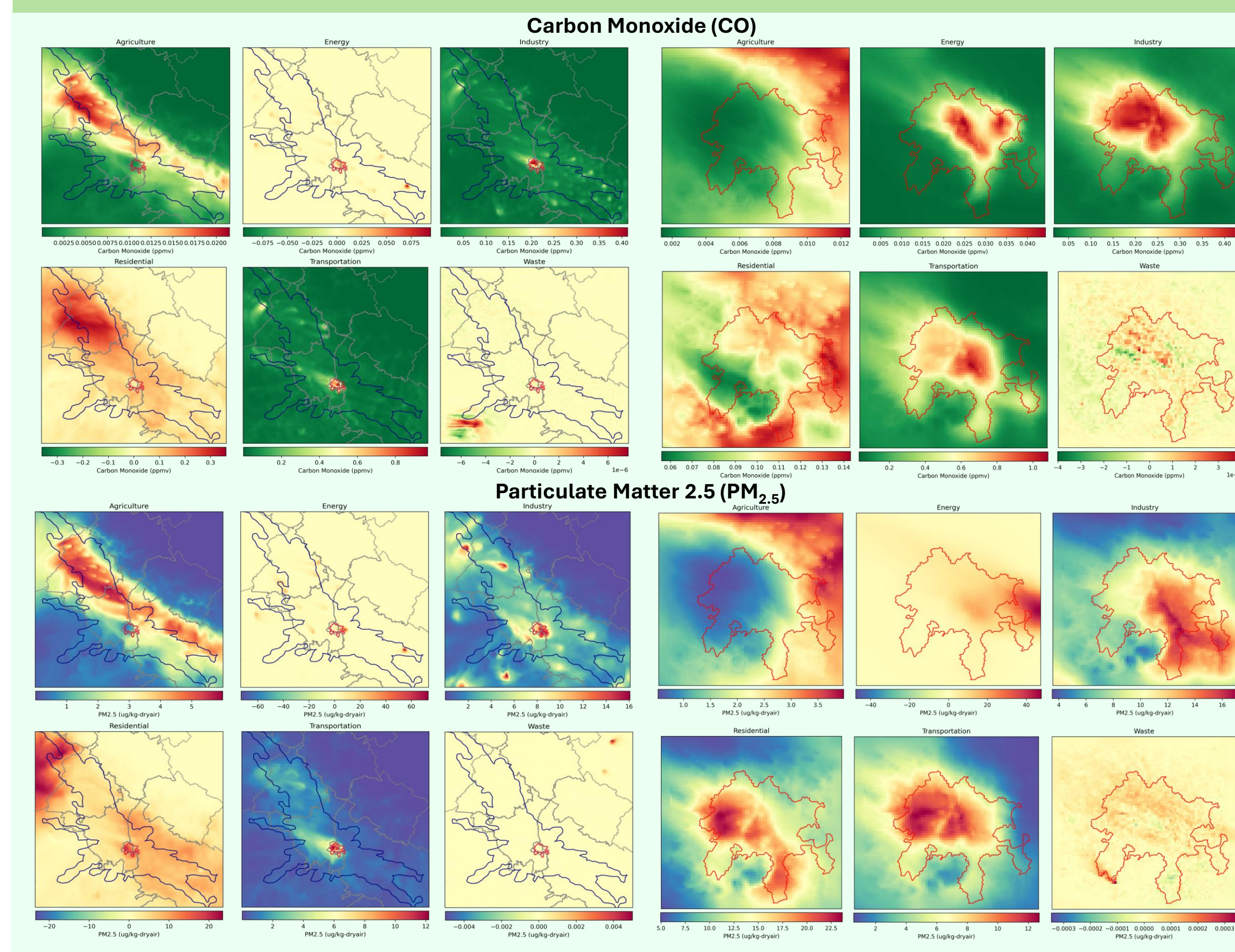
III. STUDY AREA



IV. METHODOLOGY



V. RESULT



VI. CONCLUSION

- Residential sector is contributing most to CO and PM_{2.5} in regional airshed highlighting the areas which needs attention. Major contributors are Punjab, Haryana and Pakistan
- Stubble burning happening in Punjab, Haryana and Pakistan is contributing 18% to Delhi's PM_{2.5} concentration and 3.6% to CO.
- In Local Airshed Transportation is the major source of CO whereas it is major contributor for NO₂ in regional airshed.