ENVIRONMENTAL GEOSPATIAL PORTAL

USER MANUAL

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1. Purpose of the User Manual

The user provides step-by-step guidance for users to quickly understand and effectively use the Environmental Geospatial Web Portal for Pakistan. It is designed for first-time users, analysts, researchers, and decision-makers who want to visualize and analyze environmental data at national and city levels.

2. Intended Users

This portal is designed for:

- Government departments
- Environmental regulators
- Researchers and academia
- Policy planners
- Students and analysts

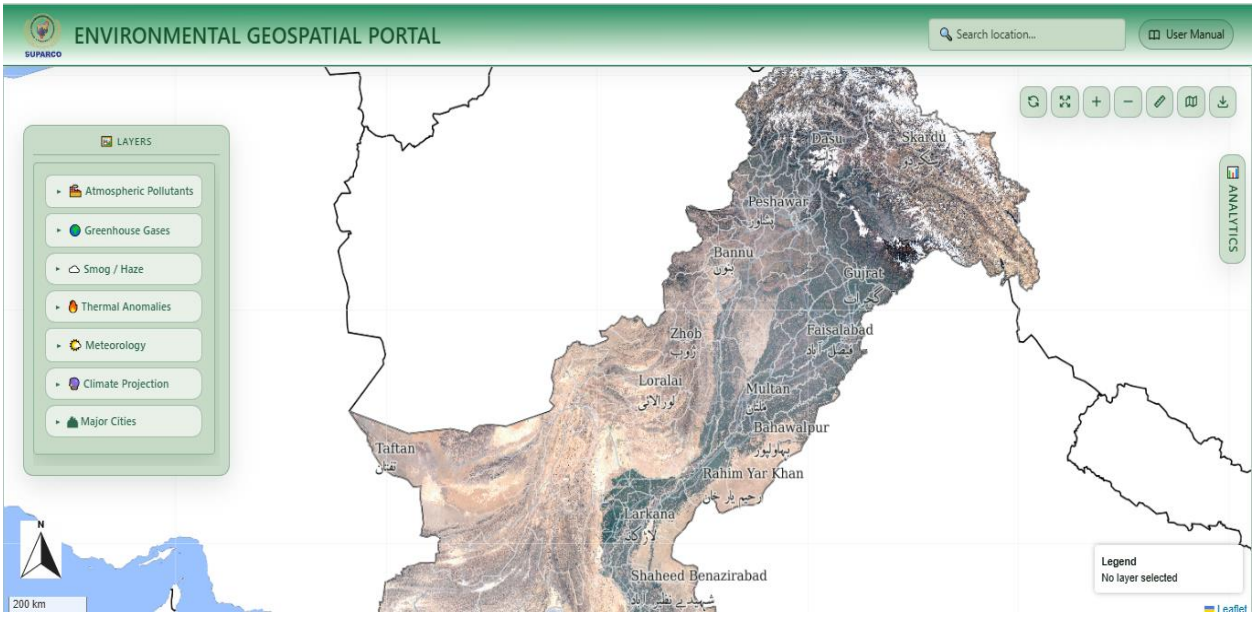
3. Rationale of Portal

The Environmental Geospatial Web Portal is an interactive map-based platform that enables users to:

- Visualize atmospheric pollutants (NO_2, SO_2, AOD)
- Monitor greenhouse gases (CH_4, CO_2)
- Track daily smog/haze coverage
- Detect thermal/fire anomalies
- Analyze meteorological parameters
- Explore city-wise trends

All datasets are presented through spatial maps, summary indicators, and time-series analytics.

4. Portal Layout at a Glance



A. Main Map Window

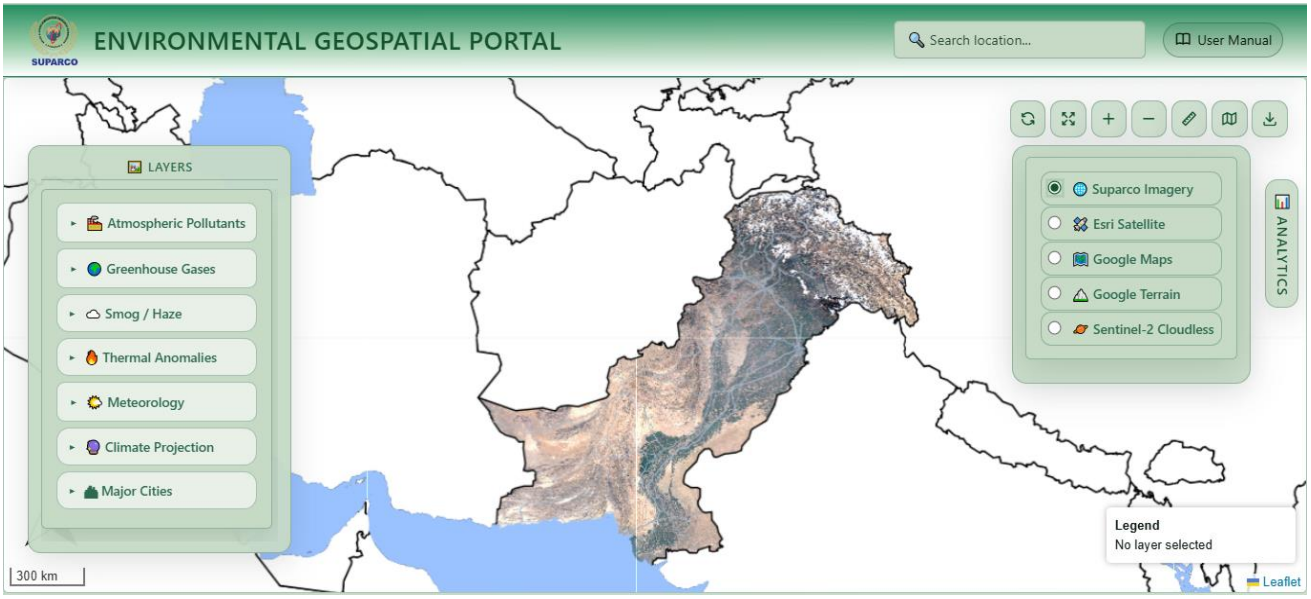
The central display where all environmental data layers appear.

Key actions:

- Zoom in/out to move between country-scale and city-scale views
- Pan across regions to explore spatial patterns

B. Base Map Selection

Use base maps to improve visualization and context.



Available options include:

- Satellite Imagery
- Google Map
- Google Terrain

C. Layers Panel (Left Side)

The Layers Panel allows to **turn datasets on/off**.

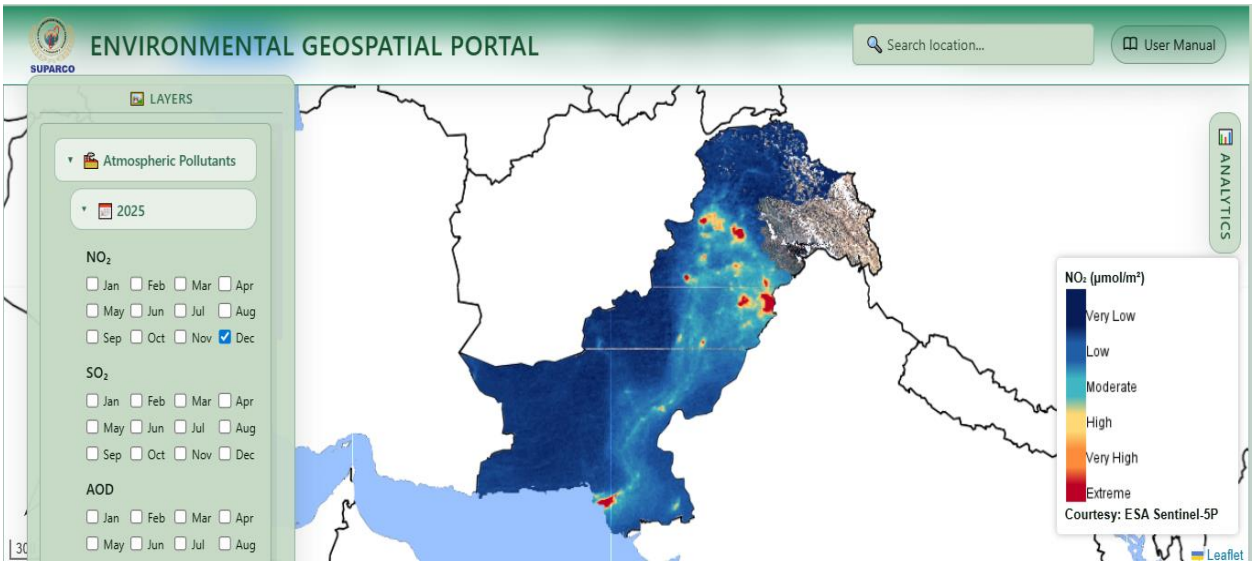
Available Data Categories

- **Atmospheric Pollutants (2019–2025)**
  - Nitrogen Dioxide (NO_2)
  - Sulfur Dioxide (SO_2)
  - Aerosol Optical Depth (AOD)
  - Ozone (O_3)
- **Greenhouse Gases (GHGs)**
  - Methane (CH_4)
  - Carbon dioxide (CO_2)
- **Smog / Haze Monitoring**
  - Daily smog extent over Pakistan and neighboring regions

- **Thermal / Fire Anomalies**
  - Daily active fire hotspots
- **Meteorological Parameters**
  - Precipitation rate (Monsoon and Winter seasons)
- **Major Cities**
  - City selection for detailed analysis (10 major cities)

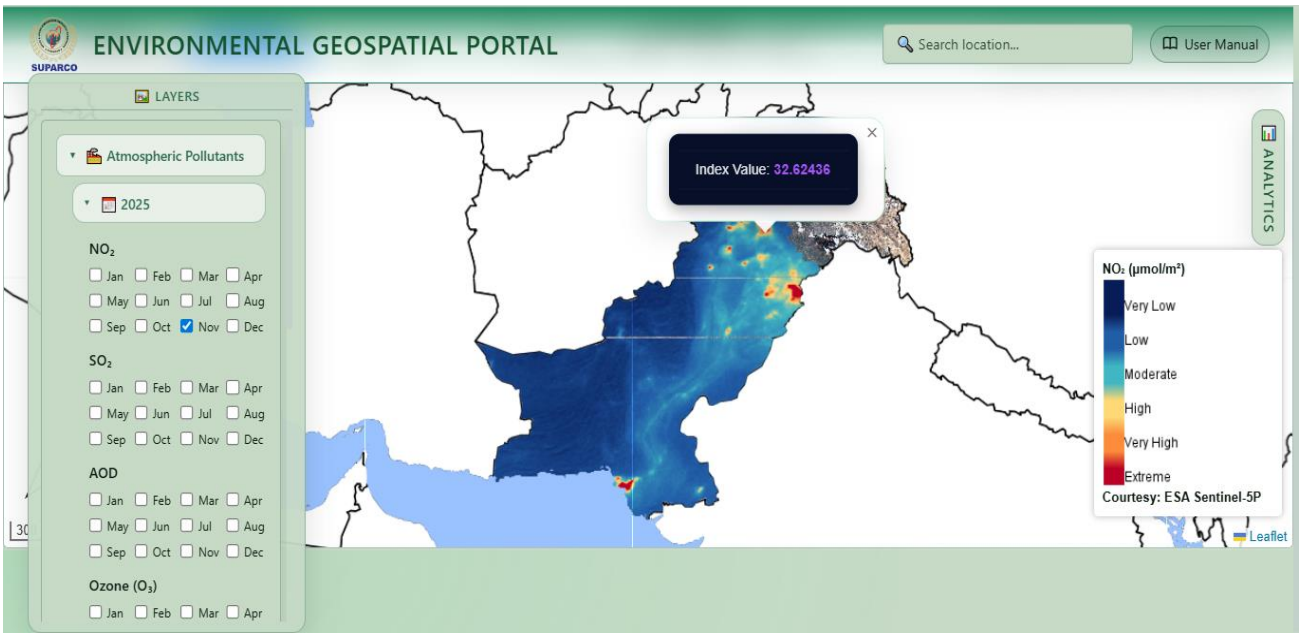
5. Visualizing Country-Level Data

1. Open the Layers Panel
2. Select a pollutant, GHG, or meteorological layer
3. Choose monthly averages in particular year (2018 or 2019 onward)
4. View spatial concentration patterns across Pakistan



6. To Check Values at a Specific Location

1. Activate the desired environmental layer
2. Click on any point on the map
3. View the pollutant or GHG value for that location

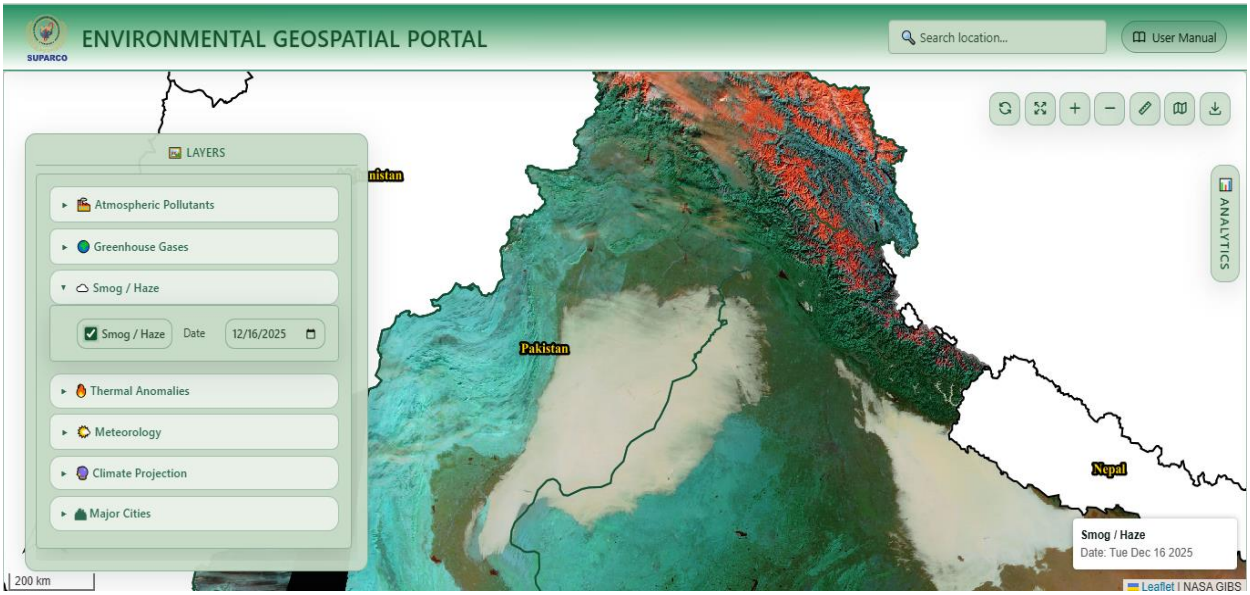


This is useful for hotspot identification and localized assessment.

7. Smog & Fire Monitoring (Daily)

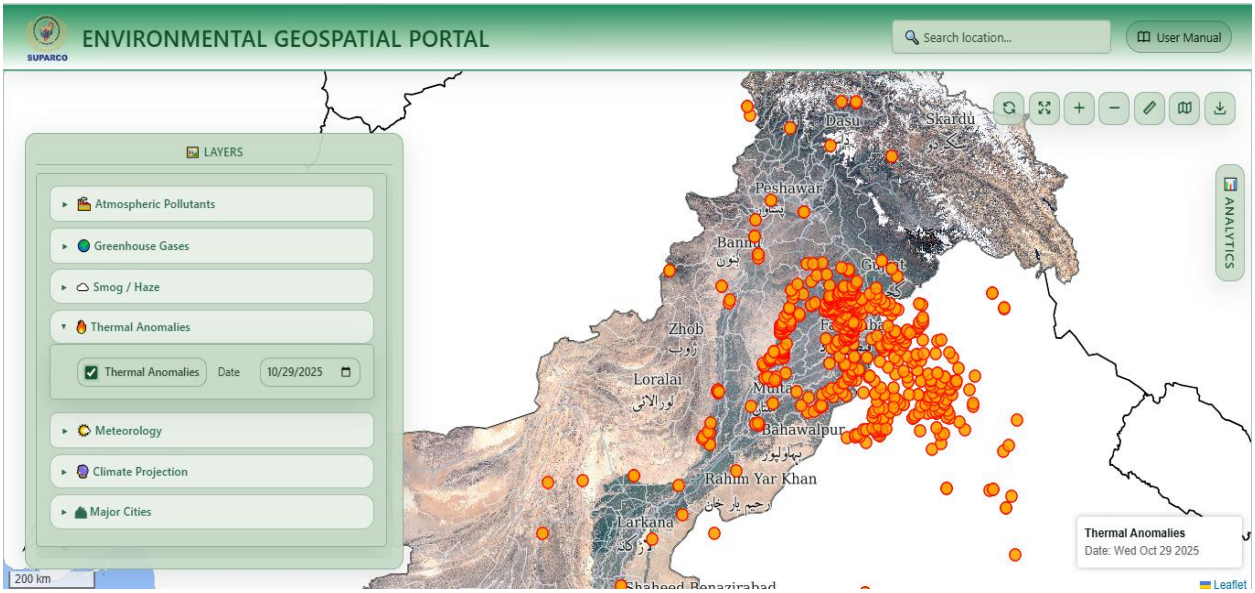
A. Smog Monitoring

- Activate the Smog / Haze layer
- View daily smog coverage over Pakistan and surrounding regions
- Useful for seasonal smog tracking and regional comparison



B. Fire / Thermal Anomalies

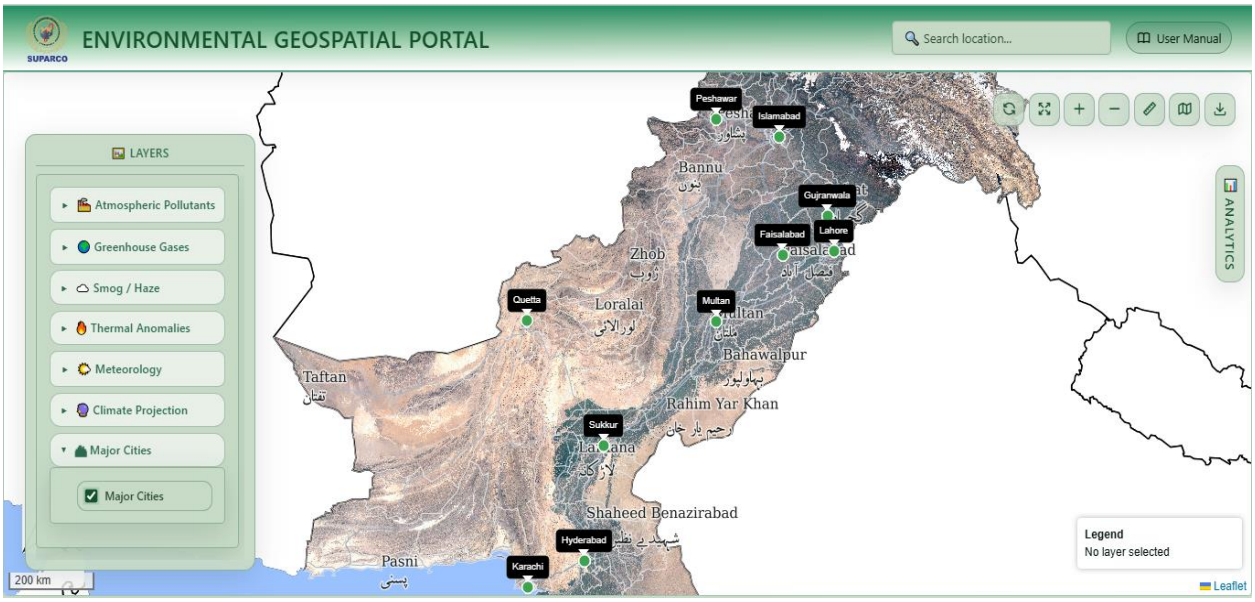
- Activate the Fire Anomalies layer
- View active fire locations and thermal hotspots
- Supports analysis of biomass burning and agricultural residue burning



8. To Perform City-Level Analysis

Step 1: Select a City

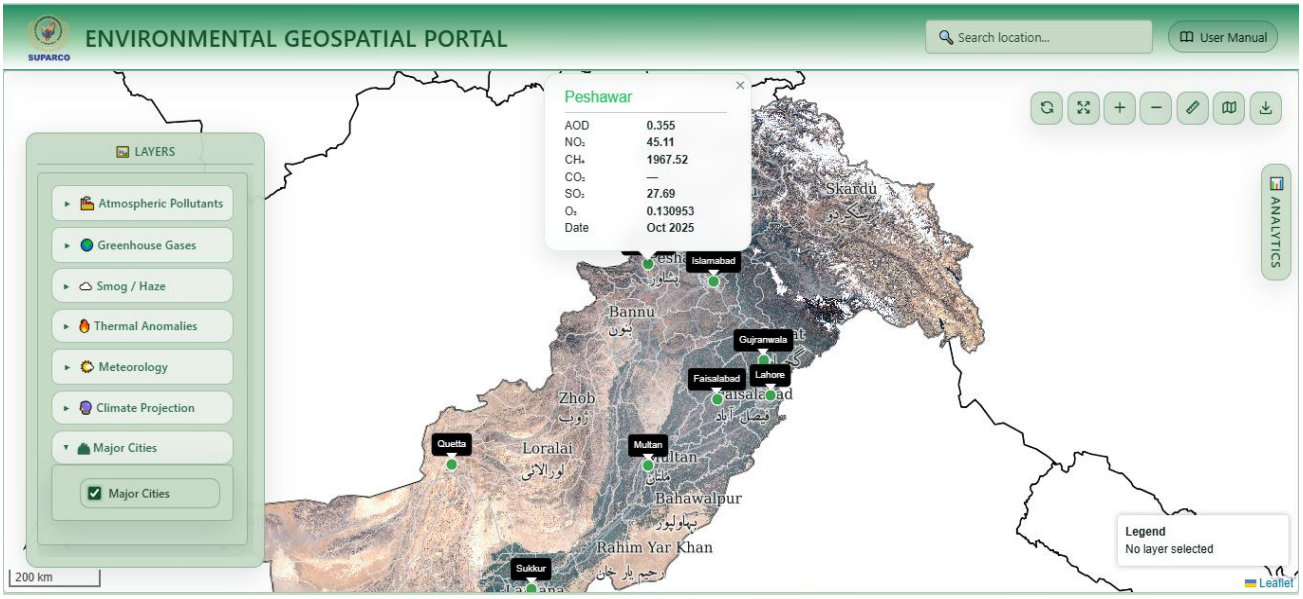
1. Turn on the **Major Cities** layer
2. Click on a city from the map or list



Step 2: View City Summary

For the selected city, the portal displays:

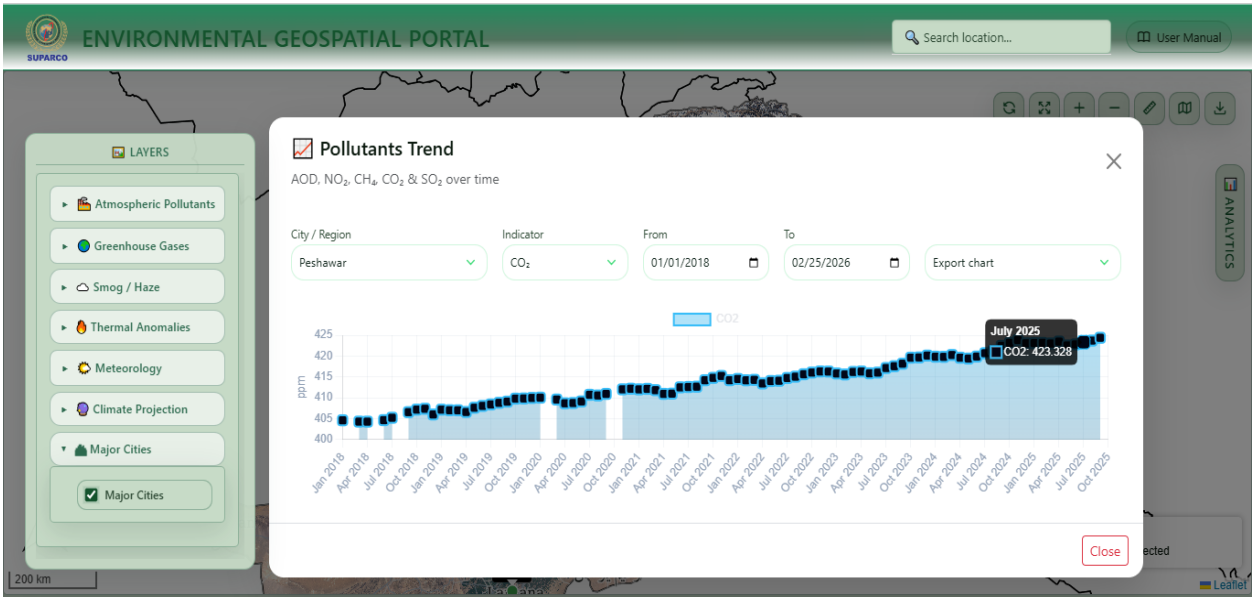
1. Summary of atmospheric pollutants and GHGs
2. Overall environmental status indicators



Step 3: Generate Time-Series Trends

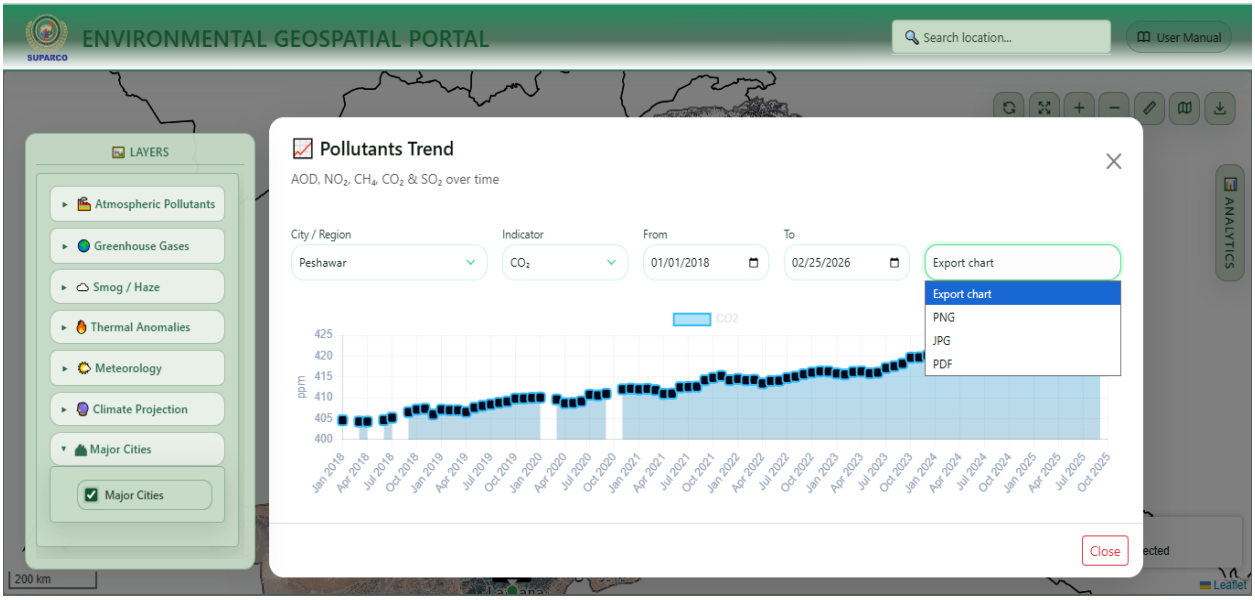
1. Choose a pollutant or GHG
2. Select the desired city
3. View time-series trends (daily / monthly / annual)

This helps users understand **long-term trends and seasonal variability**.



Step 4: Export Results

1. Export time-series plots for reports or presentations
2. Useful for policy briefs, research papers, and internal analysis



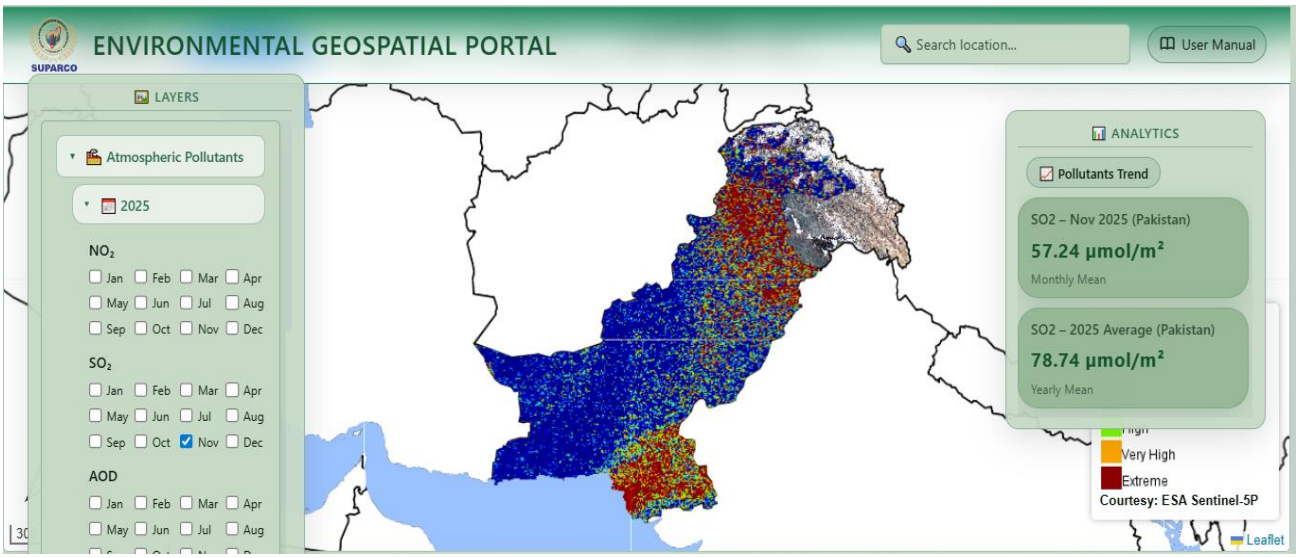
9. Analytics Panel (Right Side)

The Analytics Panel provides **quick insights and trends**.

Components

- **Pollutants Trend Analysis**
  Multi-indicator historical trends across time

- **Information Cards**
  Snapshot of recent environmental conditions



10. Legend Panel

The Legend Panel automatically updates to show:

- Color scales
- Concentration ranges
- Units of measurement

Always refer to the legend to correctly interpret maps.

11. Key Takeaway

The Environmental Geospatial Web Portal is a powerful environmental intelligence tool that transforms satellite and geospatial data into actionable insights for air quality management, climate analysis, and evidence-based decision-making.