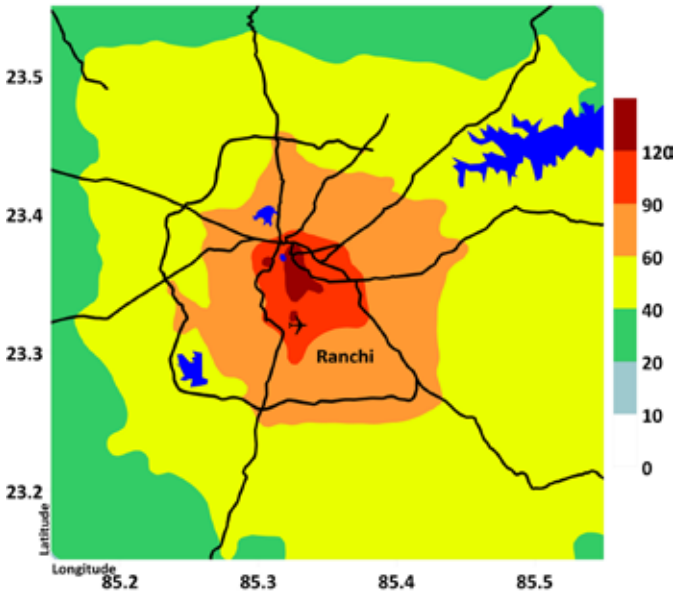
Modeled annual average $PM_{2.5}$ concentration (2015) µg/m³



For urban Ranchi, average $PM_{2.5}$ concentration was 73.0 ± 15.4 µg/m³. This is much higher than the national standard (40) and more than 7 times the WHO guideline (10).

Air monitoring infrastructure

Ranchi has 0 Continuous Air Monitoring Station (CAMS) reporting data for all the criteria pollutants and 1 manual stations reporting data on PM_{10}, SO_2, and NO_2. There should be at least 16 CAMS in the city for efficient reporting.

Annual averages from the national ambient monitoring program (2011-2015) µg/m³

PM_{10}	NO_2	SO_2
190.1 ± 52.3	35.1 ± 5.4	18.3 ± 2.0

Trend in $PM_{2.5}$ concentrations, based on satellite observations and global model simulations (1998-2014) µg/m³

URBAN emissions .info

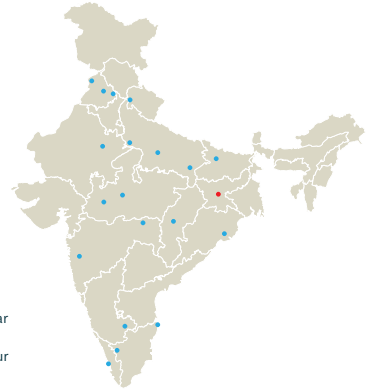
SHAKTI SUSTAINABLE ENERGY FOUNDATION

APnA CITY PROGRAM

Clearing the air with data

The Air Pollution Knowledge Assessment (APnA) City Program

Clearing the air with data



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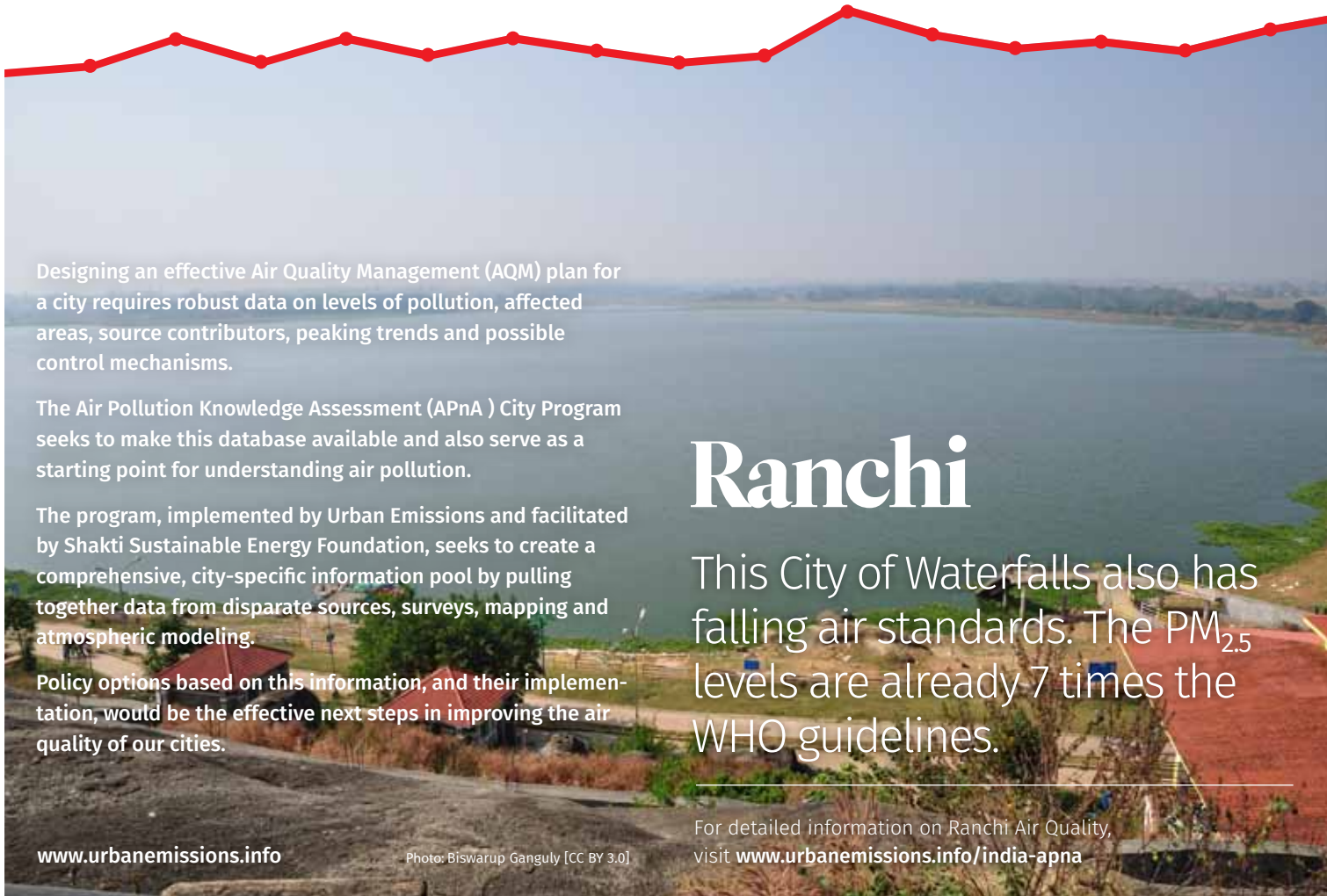
• Patna • Pune • Raipur • Ranchi • Varanasi



Designing an effective Air Quality Management (AQM) plan for a city requires robust data on levels of pollution, affected areas, source contributors, peaking trends and possible control mechanisms.

The Air Pollution Knowledge Assessment (APnA) City Program seeks to make this database available and also serve as a starting point for understanding air pollution.

The program, implemented by Urban Emissions and facilitated by Shakti Sustainable Energy Foundation, seeks to create a comprehensive, city-specific information pool by pulling together data from disparate sources, surveys, mapping and atmospheric modeling.

Policy options based on this information, and their implementation, would be the effective next steps in improving the air quality of our cities.

www.urbanemissions.info

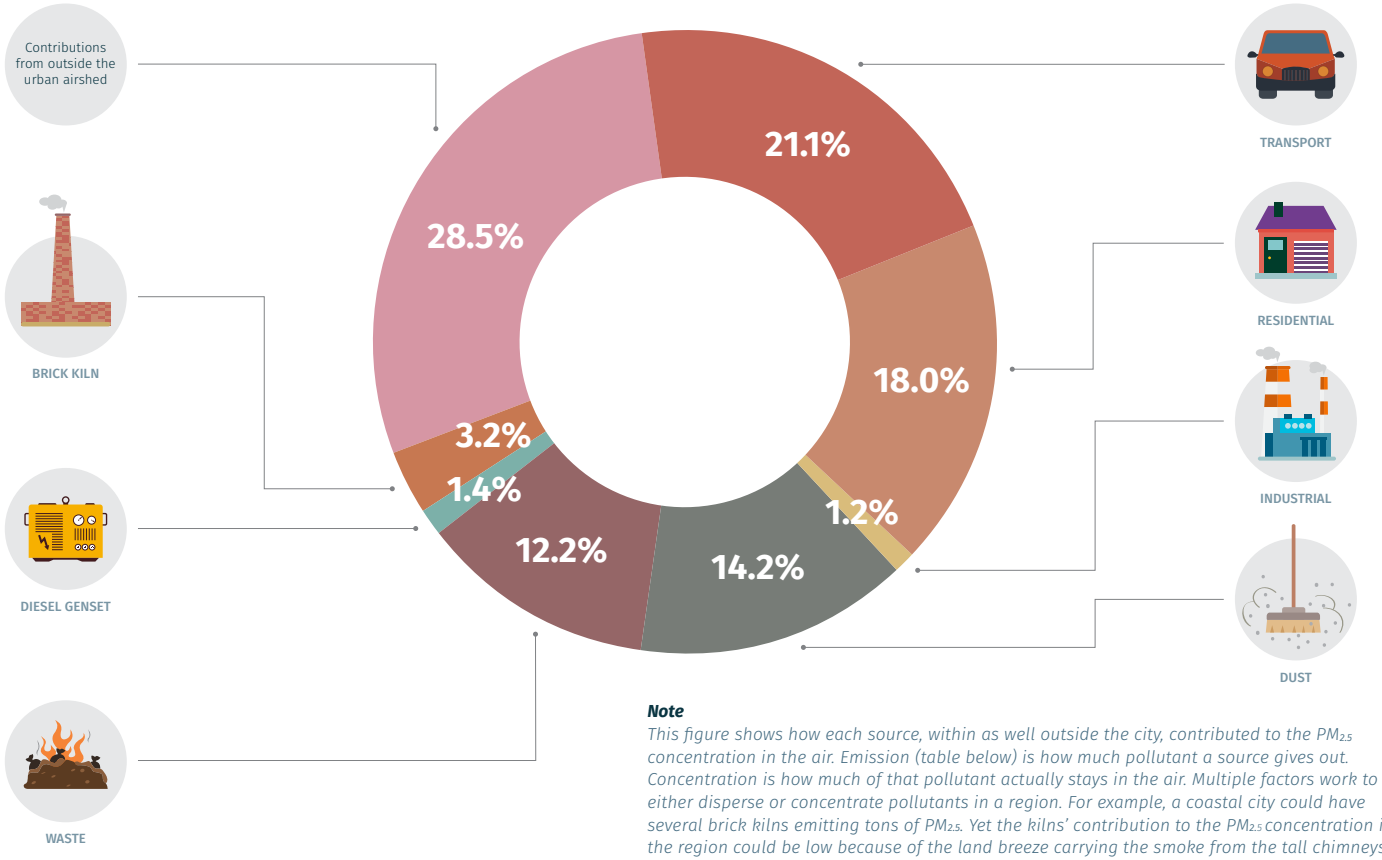
Photo: Biswarup Ganguly [CC BY 3.0]

Ranchi

This City of Waterfalls also has falling air standards. The $PM_{2.5}$ levels are already 7 times the WHO guidelines.

For detailed information on Ranchi Air Quality, visit **www.urbanemissions.info/india-apna**

$PM_{2.5}$ concentration : source–wise percentage share in 2015



Note

This figure shows how each source, within as well outside the city, contributed to the $PM_{2.5}$ concentration in the air. Emission (table below) is how much pollutant a source gives out. Concentration is how much of that pollutant actually stays in the air. Multiple factors work to either disperse or concentrate pollutants in a region. For example, a coastal city could have several brick kilns emitting tons of $PM_{2.5}$. Yet the kilns' contribution to the $PM_{2.5}$ concentration in the region could be low because of the land breeze carrying the smoke from the tall chimneys to the sea. To know how source concentration is calculated please visit the APnA city website.

$PM_{2.5}$ emissions : source–wise share in tons in 2015 and 2030 (projected)

4,500	2,550	550	2,000	1,800	300	1,450
5,600	3,050	1,000	3,350	2,550	350	1,900

Total emissions in 2015 = 13,150 tons | Total emissions in 2030 = 17,800 tons

Findings & Recommendations

- The modeled source contributions present an even share of transport (including on-road dust), domestic cooking and heating, open waste burning and influence of outside sources, as the key air pollution sources in the urban area.
- In 2015, an estimated 29% of the ambient annual $PM_{2.5}$ pollution originated outside the urban airshed, which suggests that some regional interventions could reduce the pollution loads. This contribution stemmed largely from coal-fired power plants, mining activities, large (metal and non-metal processing) industries and brick kilns located outside the urban airshed.
- The city needs to aggressively promote public and non-motorized transport as part of the city's urban development plan and improve road infrastructure to reduce on-road dust re-suspension.
- By 2030, the vehicle exhaust emissions are expected to remain constant, if and only if, Bharat 6 fuel standards are introduced nationally in 2020, as recommended by the Auto Fuel Policy.
- By 2030, the share of emissions from residential cooking and lighting is expected to decrease with an increase in LPG, residential electrification and urbanization. However, since the availability of biomass and coal in the region is high, its use is expected to continue unless an aggressive program for a 100% technology shift to cleaner options is put in place.
- The 110 brick kilns in the urban airshed are fueled mostly by coal and agri-waste. These kilns can become more energy efficient through a technology upgrade to (for example) zig-zag and fixed-chimney kilns. The coal-fired power plants need to practice stricter environmental standards for all the criteria pollutants.
- Open waste burning is dispersed across the city and requires stricter regulations to address the issue.