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AIR POLLUTION HISTORY AND PROJECTION IN AHVAZ: INSIGHTS FROM ONE OF THE MOST POLLUTED CITIES IN THE WORLD

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Abstract

Ahvaz, recognized as one of the most polluted cities globally, has drawn significant attention from scientists and policymakers due to its severe air quality issues. This study investigates the historical trends and characteristics of air pollution in Ahvaz, analyzing air quality data from 2013 to April 2021 and providing projections for 2021 and 2023 to enhance understanding of atmospheric environmental challenges. Data from the Ahvaz Air Quality Monitoring Network were analyzed using autoregressive time series models to forecast pollution levels for the following 24 months. The findings reveal that, throughout the study period, PM₁₀ and PM_{2.5} concentrations consistently exceeded the World Health Organization's air quality guidelines. The peak pollution year was 2015, particularly in traffic-congested areas, marked by elevated levels of particulate matter and gaseous pollutants.

Trend analysis identified declining patterns for PM₁₀ (-5.65%), PM_{2.5} (-4.06%), and SO₂ (-2.06%), alongside increasing trends for NO₂ (+21.79%), O₃ (+37.67%), and CO (+21.04%). Projections indicate a continued decrease in SO₂, PM₁₀, PM_{2.5}, and CO concentrations but a rise in O₃ and NO₂ levels.

This study underscores the urgent need for immediate interventions to address Ahvaz's air pollution crisis. It offers critical insights into atmospheric environmental issues in Southwest Asia, highlighting the necessity of reducing emissions from heavy industries and transportation while implementing strategies to safeguard residents during dust storms. These measures are essential for achieving a sustainable future for Ahvaz and mitigating its significant environmental challenges.

Key words: air pollution, ambient air quality, Ahvaz, forecast

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