DISAGGREGATED IMPACT OF INDUSTRIES ON WATER QUALITY IN INDIA

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ABSTRACT

Industrial growth has been a cornerstone to India's economic development, yet it has also posed significant challenges to the country's environmental sustainability, particularly in terms of water quality. While existing research has extensively explored how the industrial activities impact water quality, there are limited studies on the comparative effects across different industry types. Moreover, quality in water ecosystems holds special significance, as it directly impacts biodiversity, ecosystem health, and the sustainability of marine resources. This study aims to address this gap by systematically analyzing how various industries differentially contribute to water degradation. We look at industry-level indicators on output, composition, and spatial clustering and their impact on coastal water quality. A cross-sectional analysis is conducted on 27 states and one union territory (Puducherry) of India. The dataset combines industry-level data from the Annual Survey of Industries (ASI) with state-level water quality index constructed using water quality data from the Central Pollution Control Board (CPCB). A linear regression model was employed using the Water Quality Index (WQI) as the dependent variable. The model controls for industry characteristics (industry type, manufacturing output, years in production), operational scale (number of operational months, labor employed, rented fixed assets), and regional economic context (state GDP). Robust standard errors were applied to correct for heteroskedasticity. This study highlights the need for stricter industry-specific regulations and enhanced water quality monitoring to reduce water pollution.

Keywords: *Water Quality Index, Industrial Pollution, Manufacturing Sector, Environmental Sustainability, Econometric Analysis, India*