

## Estimating Industrial Pollution Load in Phnom Penh by Industrial Pollution Projection System

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**Abstract :** Manufacturing plays an important role in job creation around the world. In 2013, it is estimated that there were more than half a billion jobs in manufacturing. In Cambodia in 2015, the primary industry occupies 26.18% of the total economy, while agriculture is contributing 29% and the service sector 39.43%. The number of industrial factories, which are dominated by garment and textiles, has increased since 1994, mainly in Phnom Penh city. Approximately 56% out of total 1302 firms are operated in the Capital city in Cambodia. Industrialization to achieve the economic growth and social development is directly responsible for environmental degradation, threatening the ecosystem and human health issues. About 96% of total firms in Phnom Penh city are the most and moderately polluting firms, which have contributed to environmental concerns. Despite an increasing array of laws, strategies and action plans in Cambodia, the Ministry of Environment has encountered some constraints in conducting the monitoring work, including lack of human and financial resources, lack of research documents, the limited analytical knowledge, and lack of technical references. Therefore, the necessary information on industrial pollution to set strategies, priorities and action plans on environmental protection issues is absent in Cambodia. In the absence of this data, effective environmental protection cannot be implemented. The objective of this study is to estimate industrial pollution load by employing the Industrial Pollution Projection System (IPPS), a rapid environmental management tool for assessment of pollution load, to produce a scientific rational basis for preparing future policy direction to reduce industrial pollution in Phnom Penh city. Due to lack of industrial pollution data in Phnom Penh, industrial emissions to the air, water and land as well as the sum of emissions to all mediums (air, water, land) are estimated using employment economic variable in IPPS. Due to the high number of employees, the total environmental load generated in Phnom Penh city is estimated to be 476.980.93 tons in 2014, which is the highest industrial pollution compared to other locations in Cambodia. The result clearly indicates that Phnom Penh city is the highest emitter of all pollutants in comparison with environmental pollutants released by other provinces. The total emission of industrial pollutants in Phnom Penh shares 55.79% of total industrial pollution load in Cambodia. Phnom Penh city generates 189,121.68 ton of VOC, 165,410.58 ton of toxic chemicals to air, 38,523.33 ton of toxic chemicals to land and 28,967.86 ton of SO<sub>2</sub> in 2014. The results of the estimation show that Textile and Apparel sector is the highest generators of toxic chemicals into land and air, and toxic metals into land, air and water, while Basic Metal sector is the highest contributor of toxic chemicals to water. Textile and Apparel sector alone emits 436,015.84 ton of total industrial pollution loads. The results suggest that reduction in industrial pollution could be achieved by focusing on the most polluting sectors.

**Keywords :** most polluting area, polluting industry, pollution load, pollution intensity

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