Water pollution in India: An Input-Output Analysis

Topic: Environmental IO models 7
Author: Kakali Mukhopadhyay
Co-Authors: Debesh Chakraborty

India, being a rapidly growing economy, has to resolve massive environmental problems. The direct consequences of the process of development and the range of issues categorized as environmental problems include industrial pollution (i.e. pollution of air, water and soil) vehicular emission, hospital waste and domestic sewage disposal etc.

Water pollution has emerged as one of the gravest environmental threats to India. In India, every year, approximately, 50,000 million litres of waste water both industrial and domestic, is generated in urban areas. The govt. of India is spending millions of dollars every year on water pollution control. According to rough estimates, Indian government has spent nearly 4450 million USD till now on various schemes in India, like the Ganga action plan and Jamuna action plan to control water pollution in rivers. But the results are below satisfaction.

Water quality and pollution level are generally measured in terms of concentration or load – the rate of occurrence of a substance in an aqueous solution. BOD (Biochemical oxygen demand) measures the strength of an organic waste in terms of the amount of oxygen consumed (by the micro organism in water) in breaking it down. This is a standard water treatment test for the presence of organic pollutants. Moreover, a number of physical and chemical parameters (which defines the water quality) such as Ph, DO (dissolved Solids), total Solids, inorganic trace elements are quite large that also needs to be monitored for proper assessment of water quality.

A significant number of industries (for example, Livestock, Oil Refineries, Coal & Lignite, Chemical industries, Distilleries, Man made fibre, Paints & Dye, Leather, Textiles, Paper, Fertilisers, Milk & Milk Products) in India are producing water pollution above MINAS by several times. These industries do not exist in isolation from each other, rather are inter dependent. This inter dependence arises from the fact that the output of an industry is generally required as an input by another industry. Though some industries do not produce pollution directly but these industries produce pollution indirectly in a significant way.

A number of industries in India are minimizing water pollution generation in recent periods. Even if a single industry, for example, Chemical industry tries to control the pollution generated by it, production cost is bound to increase. Such an increase in production cost will affect the market price of the product of Chemical industries. Since the product of this industry is being used by other industries, these will also be affected which, in turn, will influence the prices of all the sectors. Pollution Control Scheme will also impact the demand for output of different products which are used as inputs in the above schemes. Thus the Pollution Control Scheme influences the output and prices of different industries.

Though a considerable number of studies have been conducted on water pollution in India but a quantitative analysis involving interdependence between water pollution and all branches of production and consumption of an economy is hardly any.

The current paper constructs a detailed water pollution coefficient matrix involving different types of water pollutant such as BOD, COD, SS, DO, Zinc etc using different sources available from Central Pollution Control Board of India. An Input-Output model is developed to link between water pollution generated by different industries and the various economic activities of the Indian economy for the year 2003-4. The paper estimates the total amount of water pollution generation directly and indirectly from different sectors/ activities of India. Analysis of the results indicates the variation in the pollution content of different economic activities of India. The paper also suggests some policy options to address the water pollution problem.