

1.8 Water Pollution Problems in the Indian Subcontinent with Special Reference to the Ganga Action Plan

B K Handa

**National Environmental Engineering Research Institute,
Nagpur, India**

The river Ganga has for years been subjected to tremendous pressures. Most of its water in the upper reaches is diverted to canals, and untreated domestic and industrial wastewaters are dumped into the river at several places. It is estimated that 900 million litres of sewage is discharged into the river every day and this accounts for 75% of the total pollution reaching the river. The residues of pesticides and insecticides used in agriculture also contribute non-point pollution in the river.

Recognising the magnitude of the problem and realising the importance of water quality as a principle element of river management, the Government of India established the Central Ganga Authority in 1985 for planning and execution of a timebound programme to prevent pollution of the river. The Ganga Action Plan (GAP) is being implemented through R and D inputs in the areas of water quality monitoring and modelling, wastewater treatment and environmental impact assessment provided by several research and academic institutions, the Council of Scientific and Industrial Research laboratories, public health engineering departments, consulting firms and international and bilateral funding agencies.

The National Environmental Engineering Research Institute (NEERI) is engaged in a 36 month study, which commenced in December 1988, on the assessment of the impact of the Ganga Action Plan on public health carried out under the joint sponsorship of the Ganga Project Directorate and the Indian Council of Medical Research, and in collaboration with the All-India Institute of Hygiene and Public Health, Calcutta. The study aims at evaluation of the benefits of the project vis-à-vis the costs, and identification of corrective/supplementary measures, if deemed necessary. The cities of Varanasi and Nabadwip were chosen as project sites in view of their religious and cultural significance. The study will also help in designing cost-effective strategies for similar water quality management programmes in future.

Yet another significant contribution of NEERI to GAP relates to the ranking of technology option for wastewater management. A ranking system, based on the criteria of environmental, health and aesthetic risks, annualised cost, operation and maintenance cost, land requirement and system reliability developed by the Institute, has been used to identify the most appropriate and cost effective wastewater treatment systems for two towns in Bihar, viz. Munger and Bhagalpur. There were several feasible options - activated sludge, percolating filter, design flow, stabilisation pond and aerated lagoon - chosen to meet effluent standards. The study identified a stabilisation pond as the most cost-effective system for Munger in spite of its high land requirement. For Bhagalpur, the most appropriate option was the aerated lagoon.