



## **Comparative assessment for future prediction of urban water environment using WEAP model: A case study of Kathmandu, Manila and Jakarta**

Pankaj Kumar, Masago Yoshifumi, Rafeiemam Ammar, Binaya Mishra, and Ken Fukushi

Institute for the Advanced Study of Sustainability, United Nations University (UNU-IAS), Tokyo, Japan (kumar@unu.edu)

Uncontrolled release of pollutants, increasing extreme weather condition, rapid urbanization and poor governance posing a serious threat to sustainable water resource management in developing urban spaces. Considering half of the world's mega-cities are in the Asia and the Pacific with 1.7 billion people do not access to improved water and sanitation, water security through its proper management is both an increasing concern and an imperative critical need.

This research work strives to give a brief glimpse about predicted future water environment in Bagmati, Pasig and Ciliwung rivers from three different cities viz. Manila, Kathmandu and Jakarta respectively. Hydrological model used here to foresee the collective impacts of rapid population growth because of urbanization as well as climate change on unmet demand and water quality in near future time by 2030. All three rivers are major source of water for different usage viz. domestic, industrial, agriculture and recreation but uncontrolled withdrawal and sewerage disposal causing deterioration of water environment in recent past. Water Evaluation and Planning (WEAP) model was used to model river water quality pollution future scenarios using four indicator species i.e. Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Nitrate ( $\text{NO}_3$ ). Result for simulated water quality as well as unmet demand for year 2030 when compared with that of reference year clearly indicates that not only water quality deteriorates but also unmet demands is increasing in future course of time. This also suggests that current initiatives and policies for water resource management are not sufficient enough and hence immediate and inclusive action through transdisciplinary research.