Economic Accounting of Water Use and Wastewater generation in India

Topic: Addressing Strategic Challenges of the 21st Century: Deepening the Collaboration between Input-Output Economists and Industrial Ecologists
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1) Title of the organized session
Addressing Strategic Challenges of the 21st Century: Deepening the Collaboration between Input-Output Economists and Industrial Ecologists

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Title of the Abstract
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Abstract
India is a water-stressed country. The Environmental Accounts of the Govt. Of India estimates the per-capita water availability in India at 1421m3 per annum in 2021 and projects it to decrease continuously through 2050 when it is expected to reach 1174m3 per annum .

The bulk of water resources of India are used for agricultural purpose and a relatively small proportion is used for industrial, household and other purposes. Surface water and ground water are the two main sources. The rivers generate an annual average water resource potential of 1869.37 billion m3 (BCM), the utilizable surface water resources stand only at 690.1 BCM annually. The Central Ground Water Board estimated the annual replenishable ground water at about 447 BCM in March 2013. The main source (67%) of recharge for groundwater is the south-west and north-east monsoon rainfalls. In recent times, the annual rainfall in India has been showing mostly negative departures from the normal, sometimes as much as 12% as in 2014 or 9% in 2015 and 2016. Since a major proportion of total irrigation comes from ground water, the depleting reserve of ground water is affecting the total area of cultivated land. The stage of development of ground water is defined by the total draft of ground water for all purposes as a percentage of the net annual groundwater availability. Between 2004 and 2013, vast tracts of land mainly on the western part of the country have increased their stage of development of groundwater from 0-50% to 50-100% clearly indicating the stress endemic to the system.

As we move forward on the path of development, the demand for production in agriculture industry and services is expected to be on the rise along with increasing targets for economic growth, putting further pressure of the water availability. Together with the expected increase in demand, some of the major causes of water stress identified are: Over exploitation of ground water; Intrusion of sea water; Low infrastructural development and low utilization of existing facilities and inefficient water

usage. Another pressing concern is wastewater from industries, agrochemicals, fertilizers, and organic manure. Wastewater amount is increasing significantly and polluting the existing freshwater reserves.

Therefore proper projections of water demand and generation of wastewater along with policies to ameliorate the water stress are imperative in India. Estimation of water footprint or its analogue virtual-water is a major task in this area. Generally agro-scientists estimate use evapo-transpirational coefficients to estimate the use of Green, Blue and Grey water in agricultural activity. Similarly, experts in industry and services also use technical methods to estimate their respective water requirements.It remains up to the economists to assess economy-wide water footprint of India. In this context the Input-Output methodology can be used as a very powerful tool to give a correct picture of inter-sector flows of water both through the production that is drafted via final demand as also the inter-regional and international trade flows that occur within the domestic boundaries and outside it. Further, the study calculates the generation of wastewater from the domestic economic activities and its trade counterpart. The paper will also assess the use of appropriate technology to reduce water consumption. This type of an exercise will develop a blue-print for future policy and course of action with respect to the evolving water scenario in India.