Measuring food-energy-water nexus footprint using a systematic input output approach: case study of Pune, India

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MEASURING FOOD-ENERGY-WATER NEXUS FOOTPRINT USING A SYSTEMATIC INPUT OUTPUT APPROACH: CASE STUDY OF PUNE, INDIA

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Abstract

The advent of climate change with the recognition of interlinkages, between Food, Energy and Water resource security has brought forth a renewed emphasis on ascertaining FEW footprints of varied policy interventions. In this context, the nexus approach through an IO framework has been crucial towards addressing the interplays and synergies between sectoral flows and their FEW footprint. Furthermore, establishing regional level IO gains relevance particularly in case of developments and policy interventions associated with developing metropolitan regions. While, regional level IO tables are most often not immediately available, hence have to built ground up. Since, rapid urbanization has also been associated with socio-economic inequalities in accessibility to FEW resources. India is currently undergoing great transformations under policy interventions at both economic and environmental front; wherein the country has been attracting investments to expand itâ€™s manufacturing base, while also aiming to transition into a greener economy. The district of Pune particularly is an interesting subject for the NEXUS case study, through a regional IO framework. Since, rapid urbanization, industrial expansion and the accompanying large influx of migrants have put an undue burden on its food, energy, and water (FEW) resources, challenging urban sustainability. Towards this end, this study presents the first-ever district-level economy-wide FEW nexus study in India. The processing sector of the IO transaction table for the Pune district has been prepared along with a separate account of household expenditures. Results indicate that the most resource intensive sectors in Pune district include agriculture, Manufacturing Fuels, Electricity, Food Processing Sector, Motor Vehicles and Electrical Engineering & Instrument. Pune districtâ€™s household consumption expenditure is dominated by three sectors: agriculture (34.9%), manufacturing fuels (11.3%) and food processing sector (8.3%). Suggestions have been made for sequential targeting of identified priority sectors in the short, medium, and long run based on comprehensive footprint analysis. Furthermore, the projected rise in Puneâ€™s population and expected industrial growth until 2030 indicate that demand for FEW resources is expected to witness triple-digit growth of more than 135% between 2018-30. The consequent FEW burdens of

four policy scenarios has also been analysed. The study concludes with important policy recommendations on how alternate development pathways can be leveraged to ultimately reduce the districtâ€™s overall resource use.