

Water-Energy-Food Nexus Model for India: A Way Forward for Achieving Sustainable Development Goals

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Abstract : The water, energy, and food (WEF) nexus describes the interconnectedness of these three essential elements of human life. Each of these three sectors depends on the others. India's expanding population, urbanization, and industrialization make WEF nexus management difficult. Coupling and coordination degrees can be used as indicators of a complex system's level of sustainable development. Thus, coupling and coordination of WEF sectors in India are essential for achieving Sustainable Development Goals (SDGs) 2 (zero hunger), 6 (clean water and sanitation), and 7 (affordable and clean energy). This study used a newly developed WEF nexus model and the concept of coupling coordination degree model to examine the coupling and coordination degrees of the WEF nexus at India's sub-national scale (States/Union Territories (UTs)) for the years 2011 and 2021. Results indicate that the WEF nexus coupling degree was reasonably stable among the Indian States/UTs in both years, with all having a coupling degree above 0.90, indicating high-quality coupling. However, the degree of coordination varied spatially and temporally from 'primary development' to 'quality development' for the Indian States/UTs. In 2021, it went from 53% to 14% intermediate development and 44% to 83% good development compared to 2011. Most Indian States/UTs developed SDG2 more than SDG6 and SDG7. This study also suggests that most States/UTs must implement WEF-related policies and programmes effectively to achieve quality coordinated WEF nexus development. This study may help administrators and policymakers identify States/UTs that need more attention to implement existing or new policies for achieving SDGs 2, 6, and 7.

Keywords : WEF nexus model, Pardee-RAND WEF nexus, sustainable development, policy

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