



## RESOURCE

# Complexity versus simplicity in water energy food nexus (WEF) assessment tools

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### **Description / Abstract**

Approaching water, energy, and food, as interconnected system of systems, as an alternative to traditional silo-based resources planning and management approaches continues to fall short of expectations of its research-backed benefits. The lack of nexus applications in policy and decision making can be related to numerous factors, with the main barrier being the complex nature of “nexus” systems combined with the disarray of tools attempting to model its interconnections. The paper aims to provide a method for comparing the perceived complexity of nexus tools identified by international organizations as well as primary literature sources. Eight separate criteria are introduced and discussed as measures of a tool “complexity index” and used to score the relative simplicity, or complexity, of a given tool. The result of this process is used to identify trends within existing nexus-assessment tools while guiding potential users towards appropriate tool(s) best-suited for their case study needs and objectives. The main objectives of this paper are to: 1) categorize nexus assessment tools according to a criteria-set which allows for suitable tool selection; 2) identify a method for rapid evaluation of the trade-offs for choosing different tools (simple-complex spectrum). The results of the comparative analysis of the selected nexus assessment tools concur with literature citing a growing gap between nexus research and applications in actual policy and decision-making settings. Furthermore, results suggest that tools receiving higher complexity scores, while being able to capture details to specific resource interactions, are unable to cover a larger number of interactions and system components simultaneously, as compared to lower complexity score tools. Lastly, the outcome of the analysis point towards the need for integrating more preliminary assessment capabilities, i.e. diagnostics, guidelines, and capacity building, into existing tools that improve the communication and translation of model outputs into policy and decision-making.

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