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A Principled Pragmatic Approach to Govern and Manage Complex Water Problems

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While classical scientific methods seek generalizable and predictable solutions, these methods do not work for complex problems where solution spaces are neither well-bounded nor predictable. A key challenge for many water problems—such as allocation between competing uses, providing access to water in urban slums or creating water sharing arrangements between riparian countries—is that outcomes from interventions are not predictable due to the dynamic nature of interactions and interdependencies of complex water systems. Many of these water problems are interconnected and cross boundaries, domains, scales, and sectors. These boundary crossing water problems are neither static nor linear; but often are interconnected nonlinearly with other problems and feedback. The solution space for these complex problems - involving interdependent variables, processes, actors, and institutions - can't be pre-stated. We need to recognize the disconnect among values, interests, and tools as well as problems, policies, and politics.

Scientific and technological solutions are desired for efficiency and reliability, but need to be politically feasible and actionable. Governing and managing complex water problems require difficult tradeoffs in exploring and sharing benefits and burdens through carefully crafted negotiation processes. The crafting of such negotiation process, we argue, constitutes a pragmatic approach to negotiation – one that is based on the identification of enabling conditions – as opposed to mechanistic casual explanations, and rooted in contextual conditions to specify and ensure the principles of equity and sustainability. We will use case studies to demonstrate the efficacy of the proposed principled pragmatic approach to address complex water problems.