Abstract: The Ili River originates in the mountains of Xinjiang, China, and flows across an increasingly arid landscape before terminating in Kazakhstan's Lake Balkhash, which has no outlet to the ocean. The river has been extensively impounded and diverted over the past half century to produce hydroelectric power and food on irrigated land. Water withdrawals are increasing to the extent that they are beginning to threaten the ecosystem, just as it is becoming stressed by altered inflows as glaciers retreat and disappear. If the Ili River ecosystem is to be preserved, it is crucial that we thoroughly understand the spatial and temporal nuances of the interrelationships between water, energy, and food—and the vulnerability of these components to climate change. The ecosystem has all of the characteristics of a classically-defined "wicked problem", and so it warrants treatment as a complex and dynamic challenge subject to changing assumptions, unexpected consequences, and strong social and economic overtones. Research should thus focus not just on new knowledge about the water, energy, or food component, but on advancing our understanding of the ecosystem as a whole. This will require the participation of interdisciplinary teams of researchers with both tacit and specialized knowledge.

Keywords: Ili River; Kapchagai dam and reservoir; Lake Balkhash; Central Asia; water-energy-food; wicked problems