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### Exploring the Use of Hybrid Wind-Solar Water Desalination in the Aral Sea Basin

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### The Problem in the Aral Sea Basin

- Area diminished by 74%
- ≻Volume by 90%
- ➢ Water salinity 10-fold increase (from 10 to >100 g)
- Shoreline has receded 100 km Creation of Aralkum desert
- Extinction of native fish species



#### **Desiccation of Aral Sea**



The level of the Aral Sea in the late 1950s is customarily used as the reference to see how much water has been lost. In the early 1980s, the acclerating drop of the sea level is evident. Salinity is rising; fisheries are shrinking. The Aral Sea splits into North and South. Not only has it lost most of its water, but fishing is also nearly gone. The Kok-Aral Dam begins to allow waters in the North Aral Sea to rise. Despite expansion of the North Aral Sea, only some eight percent of the water volume of the late 1950s remains.

Source: Luxner & Drake 2015, Reviving the North Aral Sea, In aramcoworld.com

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Research problem	Potential opportunities
High level of water salinity in Aral Sea basin	320 sunny days in Aral Sea basin to apply solar/wind energy for water desalination
Cooperation in the Aral sea basin to mitigate consequences of the environmental catastrophe	Conducting interdisciplinary research on water-energy – food nexus
Access to fresh water for local communities	Application of affordable hybrid-solar water desalination technology to all communities