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Tradeoff analysis between economic development and climate change adaptation strategies for River Nile Basin water resources

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Abstract This paper presents a conceptual, integrated modelling framework and provides an example tradeoff analysis between economic development goals and climate change adaptation strategies. Case study results for tradeoffs between water entering Egypt and predicted economic consequences are discussed and lessons learned (e.g. the nature and limitations of the tradeoff analysis) are summarized. Tradeoff analysis results were illustrated using Stochastic Efficiency with Respect to a Function (SERF) stochastic dominance methodology (including certainty equivalent measures of the GDP and the quantity of water), and used recent projected climate change scenarios and economic indicators. Results show that some climate change adaptation strategies may coincide with economic development agenda and objectives (such as more water release from the Aswan High Dam). Some strategies may, however, contradict existing regional economic development goals. The conceptual framework and methods developed and illustrated here have broad applications to trans-boundary water issues in Africa and elsewhere.

Key words tradeoff framework; climate change; groundwater integration; risk