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Water Sharing in the Incomati: Can we do it better?

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While the management of the Incomati River Basin (Eswatini, Mozambique and South Africa) reflects a positive example of sharing water across countries, the basin's current transboundary water allocation framework requires updating to address emerging challenges such as increased demand and climate variability. Unfortunately, comprehensive basin-wide models to inform this update process are hard to come by. This study enhances a recently developed water allocation model for the Incomati Basin and incorporates stakeholder input from all riparian countries. Stakeholders collaboratively identified priorities, concerns, and potential benefits, leading to the development of alternative allocation scenarios. These scenarios address critical issues such as increasing minimum cross-border flows, aggregating system-wide minimum flows, and the addition of new reservoirs. The scenarios were assessed using key performance indicators, including demand deficits, environmental flow requirements, withdrawal ratios, and annual flow targets. This evaluation framework highlights the trade-offs and benefits associated with various management strategies. Results indicate that alternative water distribution strategies can enhance benefits for all stakeholders while improving environmental sustainability. Notably, the addition of new reservoirs demonstrated the greatest potential for maximizing water resource benefits compared to simply increasing transboundary flows without additional storage capacity. Further analysis provided insights into managing peak flows and drought conditions, emphasizing the role of tailored interventions to enhance system resilience. The findings suggest that INMACOM and riparian countries should consider adopting flexible allocation frameworks that integrate stakeholder input and emphasize sustainable practices. By prioritizing adaptive management, the basin can strengthen resilience to future challenges and foster long-term cooperation.