Bargaining in River Sharing Problems

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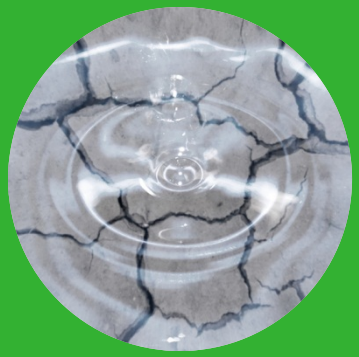
We study multiple agents along a general river structure that is expressed by a geography matrix and who have access to limited local resources, quasi-linear preferences over water and money and cost functions dependent upon river inflow and own extraction. Unanimity bargaining determines the water allocation and monetary transfers. We translate International Water Law into either disagreement outcomes or individual aspiration levels. In the former case, we apply the asymmetric Nash bargaining solution, in the latter case the agents have to compromise in order to agree and we apply the asymmetric Nash rationing solution. In both cases the optimization problem is separable into two subproblems: the efficient water allocation that maximizes utilitarian welfare given the geography matrix; and the determination of the monetary transfers associated with the weights. We show that the Nash rationing solution may result in nonparticipation, therefore we generalize to the case with participation constraints.

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