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Sharing a polluted river. (English) Zbl 1155.91449
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Summary: A river carries pollutants to people living along it if it is polluted. To make the water in the river clean, some costs are incurred. This poses a question of how to split the costs of cleaning the whole river among the agents located along it. To answer this question, we resort to the two main advocated doctrines in international disputes: the theory of Absolute Territorial Sovereignty (ATS) and the theory of Unlimited Territorial Integrity (UTI). Applying these two doctrines, we accordingly propose two methods: the Local Responsibility Sharing (LRS) method and the Upstream Equal Sharing (UES) method. For each method, we provide an axiomatic characterization. Interestingly, both the LRS method and the UES method coincide with the Shapley value solutions to the corresponding (cost) games that are naturally induced according to the ATS and the UTI doctrines respectively.

MSC:

- [91B76](#) Environmental economics (natural resource models, harvesting, pollution, etc.)
- [91A12](#) Cooperative games
- [91B32](#) Resource and cost allocation (including fair division, apportionment, etc.)

Cited in **3** Reviews
Cited in **31** Documents

Keywords:

Externality; fair allocation of pollution costs; Shapley value

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