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Trading water along a river. (English) Zbl 1208.91103
Math. Soc. Sci. 61, No. 2, 124-130 (2011).

Summary: A set of agents is located along a river. Each agent consumes certain amount of water he receives from his part of the river basin and may sell certain amount to his downstream agent if it is mutually beneficial. Water trading is restricted to two neighboring agents and an agent can only pass water to his downstream agent. We ask if this restricted trade to neighboring agents can implement an efficient allocation of water. We show that the efficient allocation of water can be achieved through the process of downstream bilateral trading. Specifically, we show that this one way “downstream” trading process implements the unique efficient allocation as well as a welfare distribution. We also show that the welfare distribution is in the core of the associated game of the problem. Moreover, we show that the coalition of agents upstream any agent obtains more welfare with the bilateral trading than with the downstream incremental distribution proposed by *S. Ambec* and *Y. Sprumont* [*J. Econ. Theory* 107, No. 2, 453–462 (2002; [Zbl 1033.91503](#))] and less than with the upstream incremental distribution proposed by *S. Ambec* and *L. Ehlers* [*Games Econ. Behav.* 64, No. 1, 35–50 (2008; [Zbl 1152.91613](#))].

MSC:

- [91B76](#) Environmental economics (natural resource models, harvesting, pollution, etc.) Cited in **6** Documents
- [91A12](#) Cooperative games
- [91B15](#) Welfare economics

Keywords:

[efficient allocation of water](#); [water trading](#); [core](#)

Full Text: [DOI](#)

References:

- [1] Ambec, S., Sharing a resource with concave benefits, *Social choice and welfare*, (2007) · [Zbl 1142.91451](#)
- [2] Ambec, S.; Ehlers, L., Sharing a river among satiable agents, *Games and economic behavior*, (2008) · [Zbl 1152.91613](#)
- [3] Ambec, S.; Ehlers, L., Cooperation and equity in the river sharing problem, ()
- [4] Ambec, S., Sprumont, Y., (2000). Sharing a River. Working Paper 2000-08, University of Montreal. · [Zbl 1033.91503](#)
- [5] Ambec, S.; Sprumont, Y., Sharing a river, *Journal of economic theory*, 107, 453-462, (2002) · [Zbl 1033.91503](#)
- [6] Barret, S., (1994). Conflict and cooperation in managing international water resources. Working Paper 1303, World Bank, Washington.
- [7] Chong, H.; Sunding, D., Water markets and trading, *Annual review of environment and resources*, 31, 239-264, (2006)
- [8] Dinar, A.; Wolf, A., International markets for water and the potential for regional cooperation: economic and political perspectives in the western middle east, *Economic development and cultural change*, 43, 43-66, (1994)
- [9] Giannias, D.A.; Lekakis, J.N., Policy analysis for an amicable, efficient and sustainable inter-country fresh water resource allocation, *Ecological economics*, 21, 231-242, (1997)
- [10] Greenberg, J.; Weber, S., Strong tiebout equilibrium under restricted preferences domain, *Journal of economic theory*, 38, 101-117, (1986) · [Zbl 0592.90017](#)
- [11] Kilgour, M., Dinar, A., (1996). Are stable agreements for sharing international river waters now possible? Working Paper 1474, World Bank, Washington.
- [12] Kilgour, M.; Dinar, A., Flexible water sharing within an international river basin, *Environmental and resource economics*, 18, 43-60, (2001)
- [13] Lekakis, J.N., Bilateral monopoly: a market for intercountry river water allocation, *Environmental management*, 22, 1-8, (1998)
- [14] Murgai, R.; Winters, P.; Sadoulet, E.; de Janvry, A., Localized and incomplete mutual insurance, *Journal of development economics*, 67, 245-274, (2002)
- [15] Shapley, L., Cores of convex games, *International journal of game theory*, 1, 11-26, (1971) · [Zbl 0222.90054](#)

- [16] Weber, M.L., Markets for water rights under environmental constraints, *Journal of environmental economics and management*, 42, 53-64, (2001) · [Zbl 0987.91050](#)
- [17] Young, M., MacDonald, D.H., Stringer, R., Bjornland, H., (2000). *Inter-State Water Trading: A Two Year Review*. Report of CSIRO Land and Water.

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