

An Ecological Implication of a Cooperative Water Resources Allocation in a River Basin

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Abstract

Recently, depletion of water supply in a river basin has produced serious damages on the fresh water ecosystem. This paper attempts to examine whether cooperative water withdrawal in a river basin will improve the ecological health of the fresh water ecosystem or not. That is, we investigate if the total water withdrawal in a river basin will decline by cooperation among the river basin countries. We consider an economy where n countries exist in a river basin, which gain benefit from their water use. In addition, upstream water use is assumed to increase the cost of water withdrawal in downstream countries. We show that if certain conditions are met, cooperative allocation will always reduce the total water use. This will in turn improves the ecological conditions of the fresh water ecosystem.

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