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# The Role of International Forums in the Advancement of Sustainable Development

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# THE IMPORTANCE OF REGULATING TRANSBOUNDARY GROUNDWATER AQUIFERS

by Emily Brophy\*

If the United States Supreme Court grants *certiorari* in a case between Mississippi and Tennessee,<sup>1</sup> the Court will have its first opportunity to determine if and how transboundary aquifers should be regulated. The applications of this case are far from surface level. Regulated groundwater allocation would protect environmental and economic sustainability by restricting over-pumping, thereby tempering the harmful effects of groundwater depletion, and protecting all parties to a transboundary aquifer from losing a freshwater source due to another's careless usage.<sup>2</sup> Over-pumping of aquifers results in significant harm, including increased water pollution, changes in stream flow, and increased costs.<sup>3</sup> If groundwater continues to be managed at the state level,<sup>4</sup> then the lack of standardized data and regulation across multi-state aquifers may prolong the problem of over-pumping, turning our nation's groundwater sources into a tragedy of the commons.<sup>5</sup>

In *Hood v. City of Memphis*, Mississippi seeks damages from the City of Memphis for the theft of billions of gallons of water that the city sold to the public through the city's water utility.<sup>6</sup> By pumping water from a transboundary aquifer over the course of several decades, the utility has effectively changed the aquifer's flow.<sup>7</sup> As a result, water that would naturally be located below Mississippi now flows towards Memphis where it accounts for about one-third of all water supplied through the public utility.<sup>8</sup>

This case illustrates the detrimental effects that a lack of regulation can have on groundwater sources. In the United States, fresh groundwater use is rising steadily, increasing five-percent between 1990 and 2000, compared to no change in total freshwater use and only a one-percent increase in fresh surface-water use.<sup>9</sup> In a city such as Memphis that pumps water from a transboundary aquifer, the absence of regulatory groundwater allocation magnifies the detrimental effects of the increased pumping on all users of the aquifer. Water experts already expect groundwater shortages in at least forty-one states in the next twenty years due to social and environmental pressures.<sup>10</sup>

Furthermore, climate change threatens to increase the pressure on fresh groundwater supplied by possibly affecting drought cycles, aquifer recharge and discharge, and human reliance on groundwater resources.<sup>11</sup>

The transboundary implications of unregulated groundwater pumping extend beyond changes in aquifer flows as experienced between Mississippi and Tennessee. Declining water levels may lead to the diminished water quality of the aquifer, affecting the water supply of all who draw from the system.<sup>12</sup> Because of the interconnectedness of the hydrologic system, a decrease in groundwater levels due to over-pumping may result in a drop in surface water levels, affecting rivers, lakes, wetlands, and similar features.<sup>13</sup> These and additional consequences of over-pumping illuminate the importance of implementing regulation over

transboundary aquifers.



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*Over-pumping of aquifers results in significant harm, including increased water pollution, changes in stream flow, and increased costs*

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## Endnotes:

<sup>1</sup> See *Hood v. City of Memphis*, 533 F. Supp. 2d 646 (N.D. Miss. 2008), *aff'd*, 570 F.3d 625, *petition for cert. filed*, (U.S. Sept. 2, 2009) (No. 09-289).

<sup>2</sup> See A. Dan Tarlock, *Water Law Reform in West Virginia*, 106 W. VA. L. REV., 495, 530 (2004) ("The best guarantee that water will be used in an environmentally sustainable manner to serve the full range of uses from basic human consumption to aquatic ecosystem conservation is an effective state water law regime.").

<sup>3</sup> See J.R. BARTOLINO & W.L. CUNNINGHAM, US GEOLOGICAL SURVEY, GROUND-WATER DEPLETION ACROSS THE NATION[hereinafter DEPLETION], available at [http://pubs.usgs.gov/fs/fs-103-03/JBartolinoFS\(2.13.04\).pdf](http://pubs.usgs.gov/fs/fs-103-03/JBartolinoFS(2.13.04).pdf).

<sup>4</sup> See generally FOOD AND WATER WATCH, UNMEASURED DANGER: AMERICA'S HIDDEN GROUNDWATER CRISIS 5 (2009), available at <http://www.foodandwaterwatch.org/water/pubs/reports/unmeasured-danger-america2019s-hidden-groundwater-crisis> (pointing out that groundwater is managed at the state level, not at the federal level, which creates discrepancies over data collection across the states, giving an incomplete view of the state of a transboundary aquifer as a whole).

**Endnotes:** The Importance of Regulating Transboundary Groundwater Aquifers continued on page 81

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**ENDNOTES: THE IMPORTANCE OF REGULATING TRANSBOUNDARY GROUNDWATER AQUIFERS** *continued from page 19*

<sup>5</sup> See generally Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968) (describing a dilemma in which the combined effect of multiple individuals acting in their own self interest diminishes the value of a shared limited resource, even when this result is not in any individual's best interest in the long run).

<sup>6</sup> Compl. at 4, *Hood v. City of Memphis*, 533 F. Supp. 2d 646 (N.D. Miss. 2008) (No. 2:05CV32-D-B).

<sup>7</sup> *Id.* at 6-7.

<sup>8</sup> *Id.* at 6-7.

<sup>9</sup> SUSAN S. HUTSON ET AL., US GEOLOGICAL SURVEY, ESTIMATED USE OF WATER IN THE UNITED STATES IN 2000, 40 (2005), available at <http://pubs.usgs.gov/circ/2004/circ1268/pdf/circular1268.pdf> (providing time series data on water consumption by source used to calculate percentage changes).

<sup>10</sup> NATIONAL GROUND WATER ASSOCIATION, GROUND WATER: A CRITICAL COMPONENT OF THE NATION'S WATER RESOURCES 1 (2004), available at [http://www.ngwa.org/ASSETS/04491558AACB498CAF8C58DB3DCF612A/position\\_paper\\_gw\\_sustainability%2009.pdf](http://www.ngwa.org/ASSETS/04491558AACB498CAF8C58DB3DCF612A/position_paper_gw_sustainability%2009.pdf).

<sup>11</sup> See DEPARTMENT OF THE INTERIOR, U.S. GEOLOGICAL SURVEY, EFFECTS OF CLIMATE VARIABILITY AND CHANGE ON GROUNDWATER RESOURCES OF THE UNITED STATES, available at <http://pubs.usgs.gov/fs/2009/3074/pdf/FS09-3074.pdf>.

<sup>12</sup> See DEPLETION, *supra* note 3, at 2 (explaining that poor-quality surface water can be drawn into an aquifer and effectively contaminate the aquifer as a whole and that pumping may cause salt water to migrate into a freshwater aquifer located in a coastal zone).

<sup>13</sup> *Food and Water Watch*, *supra* note 4, at 2-3 (illuminating the interconnectedness of the hydrological system such that a decrease in the water level of an underground aquifer also causes a drop in the water level of surrounding streams, rivers, lakes, and other water features).