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## **Managing Iraq's Water Resources: The Path to Stability and Security**

Holli Chmela



School of Public Policy

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As U.S. military presence recedes in Iraq, the Iraqi and U.S. governments and international organizations must focus on stabilizing the newly formed democracy, establishing security, and rebuilding Iraq's roads, electricity, water, and sanitation networks. Rebuilding and developing Iraq will be a challenge, but it is essential for Iraq's progress and as a tool for achieving Iraq's political and economic stability and security. Effective management of Iraq's freshwater resources is a key component to achieving these goals. To better understand the situation in Iraq today, one must first examine Iraq's recent history, the importance of water, international water policy, and "ownership" rights.

## **History**

Saddam Hussein came to power in 1979 as a key leader of the Baath Party, a secular political party steeped with pan-Arab nationalism and Arab socialism. Although Hussein is now best known for being deposed at the hands of the U.S. military in 2003, he has a long and varied history as a key member of the Baath party for nearly fifty years and as president of Iraq for twenty-four years. During Hussein's reign, Iraq entered into several wars with its neighbors over regional power struggles, border disputes, oil rights, and fears of an Iranian-led uprising among Iraq's suppressed Shia majority. Hussein and his tight circle of government elites were Sunni.<sup>i</sup>

The fallout from the wars resonates today. Hussein not only waged wars against his neighbors, but he also ordered harsh treatment and in some cases attacks against his own populace. At the end of the 1991 Gulf War, a Shia uprising in southern Iraq was forcibly quashed by Hussein's regime. As one account puts it, "The military raided settlements, killed at least tens of thousands of Marsh Arabs – the actual number may be much higher – burned settlements,

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<sup>i</sup> While both sects follow the same five main religious tenets and belief in Allah (God) and his prophet Mohammed, they differ on the successive power of the caliphates that followed the prophet. The Sunni believe the first four of Mohammed's successors and their families are rightful religious leaders. Shia believe that only the fourth, Ali, and his descendants are legitimate successors to the prophet Mohammed.

killed livestock, and destroyed the core of the local economy."<sup>1</sup> The Marsh Arabs represent a unique culture in Iraq that has thrived off the natural resources of the marshes for over 5,000 years.<sup>2</sup> To force them out of southern Iraq, and for easier access to the Iranian border, Hussein drained Iraq's famed marshland, leaving behind "vast salt flats laced with insecticides and landmines".<sup>3</sup> The goal was to remove the threat of insurgency and replace traditional marsh agriculture, like fishing and rice production, with dry agriculture production.<sup>4</sup> Historically, the marshland in southern Iraq spanned more than 15,000 square kilometers, but by the year 2000, less than 10% of the marsh area remained.<sup>5</sup>

### **Importance of water**

It is hard for people in water-rich nations to imagine living without a seemingly endless supply of water. However, approximately 1.1 billion people around the world do not have access to clean drinking water.<sup>6</sup> Around 1.6 billion face water shortage or water stress (when annual water supplies drop to below 1,700 cubic meters per person) and 1.2 billion people live in areas of the world with water scarcity (when water supplies fall below 1,000 cubic meters per person annually).<sup>7</sup> In contrast, per capita water supply in the United States in 2008 was over 9,000 cubic meters per year.<sup>8</sup> Iraq experiences both physical and economic water shortage, as the country lacks the necessary infrastructure to withdraw water from its meager resources. Iraq's water supply is also characterized by high salinity, mineralization, and general poor quality that can cause health problems as well as soil degradation.<sup>9</sup> Unless the infrastructure and equipment for water treatment facilities are upgraded, Iraq's water supply and the health of the population, especially children, will be at even higher risk.<sup>10</sup>

Iraq's freshwater resources primarily come from the two main rivers that flow through the country: the Tigris and Euphrates. These rivers and the life they provide have been one of the

most important resources in the region, largely covering all of modern Iraq and parts of northeastern Syria, southwestern Turkey, and southwestern Iran.

The river basin in Iraq – surrounded by mountains to the north, desert and arid land to the west, and flat plains and marshland in the south – is the lifeblood of Iraqi civilization. In addition to providing drinking water, river water is used for irrigating Iraq's agricultural land. Agriculture is one of the most important sectors of the economy. Statistics vary on exactly how large the agriculture sector is in Iraq, but most sources agree it is the second largest contributor to Iraq's economy, following oil.<sup>11</sup> Agriculture accounts for between 9.6%<sup>12</sup> and 12%<sup>13</sup> of gross domestic product (GDP), and is the largest employer making up 15%<sup>14</sup> to 20%<sup>15</sup> of employment.

Agriculture also accounts for the largest use of water in the country. In 1990, 92% of Iraq's freshwater withdrawals were used for the agriculture sector.<sup>16</sup> The percentage of water used for agriculture dropped by the year 2000 for a variety of reasons – likely including decreased productivity due to wars and international sanctions. Ten years ago, 78% of water withdrawal went toward irrigation and livestock, while 15% went to industry, and 7% to municipalities and domestic use.<sup>17</sup> Yet, due to low agricultural productivity, Iraq still imports much of its food needs.<sup>18</sup> The Iraqi government is focusing on achieving agricultural self-sufficiency by earmarking provincial budgets for interest-free loans and grants for farmers, providing high-quality seeds, fertilizers, and insecticides at subsidized prices, and modernizing the irrigation systems.<sup>19</sup>

Iraq has more water and arable land than many of its neighboring countries, but there have been numerous obstacles to agricultural development over the years. Due to minimal rainfall throughout the country, over 40% of the land in Iraq is desert and only 26% of the land, or 11.5 million hectares (ha), is arable.<sup>20</sup> However, as of 2005, the total cultivated land area was

estimated to be a fraction of the potential, at about 6 million ha.<sup>21</sup> Major droughts lasting several years in the late 1990s and again starting in 2007 severely hurt Iraq's vulnerable farmland.<sup>22</sup>

Political situations also contributed to these problems. The sanctions imposed on Iraq by the UN Security Council from 1990 until Saddam Hussein was deposed in 2003, prevented modern agricultural technology and supplies from reaching Iraqi farmers.<sup>23</sup> In addition, corruption and economic policies, including government subsidies and the Oil-for-Food Programme prior to the fall of the Baath regime, distorted the market and prevented competition.<sup>24</sup> It is also evident that complicated international agreements with Iraq's riparian (river-sharing) neighbors, in addition to the violence and political uncertainty within Iraq's borders, have put a major strain on the country's freshwater resources.

### **Water treaties and "ownership"**

Stabilizing and managing Iraq's freshwater resources is the key to developing and modernizing the country, reviving its economy, and establishing peace and security. However, managing Iraq's water resources depends heavily on effectively managing Iraq's relations with its neighbors. Among the most important concerns are the international agreements regulating the use of the Tigris and Euphrates rivers, including issues concerning water "ownership" and building dams.

As the Tigris enters Iraq, its average annual water flow is estimated at 21.33 cubic kilometers (km<sup>3</sup>). Unlike the Tigris, the water flow of the Euphrates depends heavily on rainfall, and fluctuates between 10 km<sup>3</sup> and 40 km<sup>3</sup> with an annual average of 30 km<sup>3</sup> as it enters Iraq.<sup>25</sup> While both rivers are known for their confluence in Iraq, it is important to note that both originate outside Iraq's borders, and therefore water flow is dependent on water use and policies implemented by upstream riparian neighbors Turkey and Syria. Since 98% of Iraq's water supply

comes from two rivers that first flow through several other countries, managing Iraq's water supply is an international issue.<sup>26</sup>

There have been several attempts to establish international agreements between the three riparian states, however all have failed to achieve trilateral support. In 1946, Turkey and Iraq signed the Treaty of Friendship and Neighborly Relations, which covered the Tigris and Euphrates rivers. It established information sharing between both parties, permitted Iraq to build dams in Turkey on a case-by-case basis, and required Turkey to inform Iraq of any planned infrastructure along the rivers.<sup>27</sup> In 1987, Turkey and Syria signed a one-page protocol determining the water flow of the Euphrates at the Turkey-Syria border; the agreement was reconfirmed in 1992 and 1993.<sup>28</sup> In another one-page agreement between Iraq and Syria, signed in 1996, the two riparian states fixed the distribution of the Euphrates between them at 42% to Syria and 58% to Iraq.<sup>29</sup>

To date, however, there have been no agreements between all three states largely due to opposition from Turkey on the definition of "transnational" versus "international" rivers. According to officials in Turkey, an international river must form a border between at least two countries. Labeling the Tigris and Euphrates rivers as transnational gives Turkey the power to deny or allow the downstream states any "sovereign power" under the Harmon Doctrine.<sup>30</sup> Iraq and Syria responded to Turkey's definition of "international river" by drawing on the doctrine of absolute territorial integrity<sup>31</sup>, which argues that lower riparian states have an absolute right to the unaltered flow of water from an upstream state.<sup>32</sup> In 1992, former Turkish Prime Minister Suleyman Demirel clearly stated the government's position and level of dedication to reaching a solution pleasing to all three countries:

Neither Syria nor Iraq can lay claim to Turkey's rivers any more than Ankara could claim their oil. This is a matter of sovereignty. We have a right to do

anything we like. The water resources are Turkey's, the oil resources are theirs. We don't say we share their oil resources, and they can't say they share our water resources.<sup>33</sup>

The problem with this position is that Iraq can only extract oil from within its borders and directly below its earth, while the water from the rivers flows through all three states.

According to research on sharing international rivers, there are several main factors that must hold for water resources to be managed effectively and responsibly. First, all riparian states must have an interest in cooperating. Second, a neutral mediator is needed to facilitate negotiations and coordinate the implementation of any agreement. Finally, an institution is established, or existing institutions are redesigned, to maintain long-term cooperation.<sup>34</sup>

Furthermore, cooperation is best reached when "the powerful riparian is located upstream, states are not enemies, a powerful third party facilitates cooperation, and there is minimal dependence on the river. Conflict is more likely when adversarial states are highly dependent on the river and they face a water deficit."<sup>35</sup>

What is key here is the need for a neutral party, an international organization for example, to help facilitate a trilateral agreement among Turkey, Syria, and Iraq. This model has proven to be successful in other cases. The World Bank successfully facilitated the Indus River negotiations between India and Pakistan. Likewise, the UN Development Programme mediated among Cambodia, Laos, Thailand, and Vietnam resulting in the 1995 Mekong treaty. The UN Environmental Programme served the same role in negotiations among Botswana, Mozambique, Tanzania, Zambia, and Zimbabwe regarding the Zambezi River in 1987.<sup>36</sup> This shows that water agreements can be made between nations with a history of conflict and distrust, as well as among multiple riparian states. Without a similar arrangement, conflicts over the Tigris and Euphrates will persist as they have for decades, and any future development in Iraq will be stifled.

Why should a powerful, upstream, democracy like Turkey be concerned with Iraq's development prospects? Without coordination among all three countries, water will be poorly managed and wasted. Moreover, any instability in Iraq can spill over its borders. Arguably, Iraq has been anything but stable for the past 30 years, while Syria and especially Turkey have improved economically and socially. (See "Select Development Indicators", below.) Most of the instability in Iraq for the past decades has been a result of politics and war, not a lack of water resources. However, in that same time period, Turkey and Syria have also both built dams and increased water use from the two rivers. These actions and the aggressive tactics taken by the Hussein regime have severely hurt Iraq's access to freshwater, changing the dynamics of instability.

Table – 1  
*Select Development Indicators*<sup>37</sup>

		<b>Turkey</b>	<b>Syria</b>	<b>Iraq</b>
% of population using improved drinking-water sources, 2006	Total	97	89	77
	Urban	98	95	88
	Rural	95	83	56
% of population using improved sanitation facilities, 2006	Total	88	92	76
	Urban	96	96	80
	Rural	72	88	69
GNI per capita (US\$), 2008		9,340	2,090	2,170
GDP per capita average annual growth rate (%), 1990–2008		2.4	1.3	no data
ODA inflow in millions US\$, 2007		797	75	9,115

Sources: UNICEF, World Health Organization, Multiple Indicator Cluster Surveys and Demographic and Health Surveys, World Bank, Organisation for Economic Co-operation and Development

As the United States entered Iraq in 2003, legal scholar Eyal Benvenisti pointed out the complications associated with international agreements over water use, when one riparian state – Iraq – is under occupation by non-riparian entities:

The obligation to provide sufficient drinking water and water for the production of food is subject to certain limitations stemming from the fact that the occupant has only a temporary title over the occupied area, a title which does not amount to sovereign status.<sup>38</sup>



The Hague Regulations and Geneva Convention state that an occupant must ensure public order and security in the occupied state, and provide basic services to civilians.<sup>39</sup> In the same vein, international human rights law establishes that "the provision of food and clean drinking water to the population" is an obligation.<sup>40</sup>

All this suggests that the United States, recognized by the UN Security Council as one of the occupiers of Iraq, had the responsibility to put forward strategies to manage Iraq's water resources. Now that Iraq has a sovereign government, it has the onus to come up with water-related demands. Benvenisti concludes that if Iraq, the United States, and the international community in general seek durable peace in the region, "they should negotiate with Syria, and particularly with Turkey, an equitable arrangement for the utilization of the Tigris and Euphrates rivers."<sup>41</sup>

Literature on sharing international rivers points out several important benefits from cooperation among riparian states, including environmental, direct economic, political, and indirect economic benefits.<sup>42</sup> First, there are benefits to the river in terms of water quality, ecology, soil conservation, biodiversity, and overall sustainability. Second, the benefits from the river increase over time. Improved water resource management makes it possible to develop hydropower capabilities, increase agricultural production, improve flood-drought management, and provide recreational activities that benefit all. Cooperation can also reduce costs from food and energy, and allow policy and funding to shift away from disputes or conflicts and from the costs associated with non-cooperation. Finally, there are benefits that reach beyond the river, such as improved regional relations and integration of regional infrastructure, markets, and trade.<sup>43</sup> Sadoff and Grey summarize, "Greater cooperation on an international river will lead to better management and development of the river itself, and, in many cases, it may also promote

economic integration and regional security, beyond the river.”<sup>44</sup>

### **Development suggestions**

The final step is to look at suggestions for how Iraq's new government, and the international community, can manage its water resources. Iraq's second parliamentary election was held in early March, but it took over eight months for the results to be certified and the government formed, amid calls for a recount, allegations of fraud, and general political maneuvering. Iraq has broken the world record for the longest period “between holding parliamentary elections and forming a government.”<sup>45</sup> Without the government in place, there has been political instability and an increase in violence, and leaders have lacked the authority to set up the necessary infrastructure and broker agreements.

Now that the internal political issues have been settled, Iraq must seek the help of a third party, such as an international organization, to help organize a trilateral agreement between Iraq, Turkey, and Syria that equitably determines water-sharing principles and rights. The theories of absolute territorial authority and integrity must be abandoned, and joint management under the community of interests theory should be adopted.<sup>46</sup> A river authority comprised of members from all riparian states as well as disinterested parties must be formed to oversee any water agreement. It is important that this authority has the power to regulate for noncompliance and settle disputes. With a ratified international agreement, Iraq and its neighbors can begin to reap the mutual benefits of cooperation. Further, any construction of dams or reservoirs should be agreed on by all parties and be in the best interest of all parties. All parties must also take into consideration ecological and environmental impacts, health concerns, and appropriate levels of water use for agricultural irrigation.

Water is a limited resource, and as such, Iraq needs to find other sources to accommodate its water needs. For example, there is significant room for improving Iraq's wastewater treatment facilities. With the appropriate infrastructure, treated wastewater could supply much of the country's irrigation needs and prevent diseases and contamination that result from untreated wastewater stored in inadequate facilities and generally unsanitary conditions. Implementing water desalination and purification facilities throughout the country would also make distribution of water more efficient and equitable. On that note, the government must take a sensitive approach to water distribution services in order to bring drinking water to Iraqis in all neighborhoods and provinces -- without real or perceived sectarian favoritism, which can fuel violence and discontent.

Managing Iraq's water resources through brokering an agreement with its riparian neighbors is the key to development and establishing security in the country. Achieving these goals depends on a delicate balancing act that requires internal political stability, improved regional relations, and attention to Iraq's history and specific social needs. Without these components in accord, Iraq will likely face more difficult times ahead. Iraq's new government must make water a priority over the next four years, or face further political and economic instability as well as physical and social insecurity.

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<sup>1</sup> Curtis J. Richardson and Najah A. Hussain, "Restoring the Garden of Eden: An Ecological Assessment of the Marshes of Iraq," *BioScience* vol. 56 no. 6 (June 2006): 477.

<sup>2</sup> Human Rights Watch Briefing Report, "The Iraqi Government Assault on the Marsh Arabs," January 2003. <http://www.hrw.org/backgroundunder/mena/marsharabs1.htm>

<sup>3</sup> Andrew Lawler, "Reviving Iraq's Wetlands," *Science* vol. 307 no. 5713 (February 25, 2005): 1186-1189.

<sup>4</sup> Ibid.

<sup>5</sup> Richardson and Hussain, "Restoring the Garden of Eden: An Ecological Assessment of the Marshes of Iraq." Also: Curtis J. Richardson, et al., "The Restoration Potential of the Mesopotamian Marshes of Iraq," *Science* vol. 307 no. 5713 (February 25, 2005): 1307.

<sup>6</sup> WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation,

"Water for life: Making it happen," 2005.

[http://www.who.int/water\\_sanitation\\_health/waterforlife.pdf](http://www.who.int/water_sanitation_health/waterforlife.pdf)

<sup>7</sup> United Nations, Water for Life Decade 2005-2015,  
<http://www.un.org/waterforlifedecade/scarcity.html> and  
<http://www.un.org/waterforlifedecade/factsheet.html>

<sup>8</sup> The World Bank, Food and Agriculture Organization, AQUASTAT. Renewable Internal freshwater resources per capita (cubic meters).

<http://data.worldbank.org/indicator/ER.H2O.INTR.PC/countries/US?display=default>

<sup>9</sup> U.S. Department of Defense Unclassified Documents, "Iraq Water Treatment Vulnerabilities," (January 1991, declassified September 1, 1995).

[http://www.gulflink.osd.mil/declassdocs/dia/19950901/950901\\_511rept\\_91.html](http://www.gulflink.osd.mil/declassdocs/dia/19950901/950901_511rept_91.html)

<sup>10</sup> Thomas J. Nagy, "The Role of 'Iraq Water Treatment Vulnerabilities' in Halting One Genocide and Preventing Others," Association of Genocide Scholars, University of Minnesota -- Minneapolis (June 12, 2001).

<sup>11</sup> U.S. State Department Bureau of Near Eastern Affairs, "Background Note: Iraq," (September 17, 2010). <http://www.state.gov/r/pa/ei/bgn/6804.htm>.

<sup>12</sup> CIA – The World Factbook, Iraq. <https://www.cia.gov/library/publications/the-world-factbook/geos/iz.html>

<sup>13</sup> U.S. State Department Bureau of Near Eastern Affairs, "Background Note: Iraq."

<sup>14</sup> Ibid.

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- <sup>15</sup> Food and Agriculture Organization of the United Nations, Iraq. <http://www.faoiraq.org/>
- <sup>16</sup> Earth Trends, "Water Resources and Freshwater Ecosystems – Iraq," (2003). [http://earthtrends.wri.org/pdf\\_library/country\\_profiles/wat\\_cou\\_368.pdf](http://earthtrends.wri.org/pdf_library/country_profiles/wat_cou_368.pdf)
- <sup>17</sup> AQUASTAT Survey, "Irrigation in the Middle East region in figures: Iraq," (2008): 205. <ftp://ftp.fao.org/docrep/fao/012/i0936e/i0936e08.pdf>
- <sup>18</sup> EconomyWatch, "Iraq Trade, Exports and Imports." [http://www.economywatch.com/world\\_economy/iraq/export-import.html](http://www.economywatch.com/world_economy/iraq/export-import.html).
- <sup>19</sup> USAID Assistance for Iraq – Agriculture. <http://www.usaid.gov/iraq/accomplishments/agri.html>
- <sup>20</sup> AQUASTAT, "Irrigation in the Middle East region in figures: Iraq," 199.
- <sup>21</sup> Ibid., 201.
- <sup>22</sup> Ibid., 210; Review of international news sources from the period.
- <sup>23</sup> Nagy, "The Role of 'Iraq Water Treatment Vulnerabilities' in Halting One Genocide and Preventing Others."
- <sup>24</sup> U.S. State Department Bureau of Near Eastern Affairs, "Background Note: Iraq."
- <sup>25</sup> AQUASTAT, "Irrigation in the Middle East region in figures: Iraq," 203.
- <sup>26</sup> Neda A. Zawahri, "Stabilizing Iraq's Water Supply: what the Euphrates and Tigris rivers can learn from the Indus," *Third World Quarterly* vol. 27 no. 6 (2006): 1041.
- <sup>27</sup> Zawahri, "Stabilizing Iraq's Water Supply: what the Euphrates and Tigris rivers can learn from the Indus," 1047.
- <sup>28</sup> Ibid.
- <sup>29</sup> Ibid.
- <sup>30</sup> Zawahri, "Stabilizing Iraq's Water Supply: what the Euphrates and Tigris rivers can learn from the Indus," 1046.
- <sup>31</sup> Ibid.
- <sup>32</sup> Malgosia A. Fitzmaurice, "International Protection of the Environment," *The Hague Academy Lectures* vol. 293 (2001): 432-433.
- <sup>33</sup> Often quoted; one source by Christopher Reed, "Paradise Lost?" *Harvard Magazine* (January-February 2005). <http://harvardmagazine.com/2005/01/paradise-lost.html>.

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<sup>34</sup> Zawahri, "Stabilizing Iraq's Water Supply: what the Euphrates and Tigris rivers can learn from the Indus," 1042.

<sup>35</sup> Ibid.

<sup>36</sup> Zawahri, "Stabilizing Iraq's Water Supply: what the Euphrates and Tigris rivers can learn from the Indus," 1052.

<sup>37</sup> UNICEF and other sources. Iraq: [http://www.unicef.org/infobycountry/iraq\\_statistics.html](http://www.unicef.org/infobycountry/iraq_statistics.html); Syrian Arab Republic: [http://www.unicef.org/infobycountry/syria\\_statistics.html](http://www.unicef.org/infobycountry/syria_statistics.html); Turkey: [http://www.unicef.org/infobycountry/Turkey\\_statistics.html](http://www.unicef.org/infobycountry/Turkey_statistics.html)

<sup>38</sup> Eyal Benvenisti, "Water Conflicts During the Occupation of Iraq," *The American Journal of International Law* vol. 97 no. 4 (October 2003): 868.

<sup>39</sup> Benvenisti, "Water Conflicts During the Occupation of Iraq," 867.

<sup>40</sup> Benvenisti, "Water Conflicts During the Occupation of Iraq," 868.

<sup>41</sup> Benvenisti, "Water Conflicts During the Occupation of Iraq," 872.

<sup>42</sup> Claudia W. Sadoff and David Grey, "Beyond the river: the benefits of cooperation on international rivers," *Water Policy* 4 (July 2002): 399-400

<sup>43</sup> Ibid.

<sup>44</sup> Ibid., 403

<sup>45</sup> Leila Fadel, "Still struggling to form government, Iraq breaks world record," *The Washington Post*, October 1, 2010.

<sup>46</sup> Fitzmaurice, "International Protection of the Environment," 433.

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