Water and Peace in Iraq

Water Access, Ethno-religious Identity, and Conflict in Iraq's Peacebuilding Process

by Jill Baggerman

Iraq's Peace

Peace and Iraq are words not often spoken of in conjunction. Iraq is commonly associated with its many conflict-related afflictions. But even with Saddam Hussein and Islamic State in the looming memory, the nation and its partners continue to push forward. Iraqis insist on resilience and reconstruction.

How to prioritize amidst the enormous challenges of recovering from decades of conflict and what, we hope, goes down in history as the worst terrorist group the world ever sees? Peacebuilding practitioners argue that addressing conflict drivers is a key priority, looking to the past to inform the future. Development experts argue that improving livelihoods is central, looking to similar situations elsewhere. Foreign military and political leaders emphasize stability and returning displaced persons to their home cities, forming 2-year plan after 5-year plan. The government of Iraq zeros in on rebuilding social and physical institutions, looking at the damage and designing blueprints. Humanitarian organizations continue dishing out resources for today's pressing needs. Presumably, mothers keep finding ways to feed their families, children keep soaking in their environment, and everyone keeps their phone nearby waiting for news of loved ones.

Whose priorities are highest?

From a computer in the West, I humbly enter the conversation. I do not attempt to override the priorities of those experiencing the conflict, those for whom lasting peace is not some abstract goal, but a living hope. I conduct this research in hopes that the facts I consolidate and relational trends I identify can, in any way, contribute to wider efforts of identifying priority areas or priority peoples within the Iraqi population for whom specific efforts could be targeted for peacebuilding benefit.

Scope of this paper

News and scholarly pieces, whether directly or by inference, often link sectarian divisions to violence in Iraq.[1] More generally, linkages between water and peace are often referenced in the academic sphere.[2] My efforts in this paper are to understand the empirical evidence for these assumptions or claims.

My guiding research questions are: *To what extent is the anecdotal evidence suggesting a link between ethno-religious identity and water access supported by empirical evidence? How are ethno-religious groups and water access related to incidents of violence post-1991 and post-2013?* I analyze these linkages—between ethno-religious identity, access to safe drinking water, and violence—statistically and geographically in Iraq. I hope that keying in on and better understanding these relationships will help identify if or to what extent these priorities should be included as components in Iraq's peacebuilding process.

Background

This region of the Fertile Crescent has a long and complex history well beyond the scope of this paper. The Tigris and Euphrates rivers flowing through Iraq have supplied several civilizations and uncountable peoples with water over the centuries. A briefest of background context is provided here.

The start of 1991 saw the U.S.-led military campaign Operation Desert Storm conclude the Gulf War and force Iraq to withdraw.[3] From that year onward, several sectarian uprisings and crackdowns occurred within the country while President Saddam Hussein[4] steadily built international economic relationships and his military capabilities. In 2003, a U.S.-led operation removed Hussein from power, prompting increases in violent events, including terrorist attacks and car bombings, throughout several government elections or appointments over the next decade.

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[1] See for instance Rukmini Callimachi, "The ISIS Files," New York Times, April 4, 2018. https://www.nytimes.com/interactive/2018/04/04/world/middleeast/isis-documents-mosul-iraq.html and "The Sunni-Shia Divide," Council on Foreign Relations, February 2016, https://www.cfr.org/interactives/sunni-shia-divide#!/sunni-shia-divide.

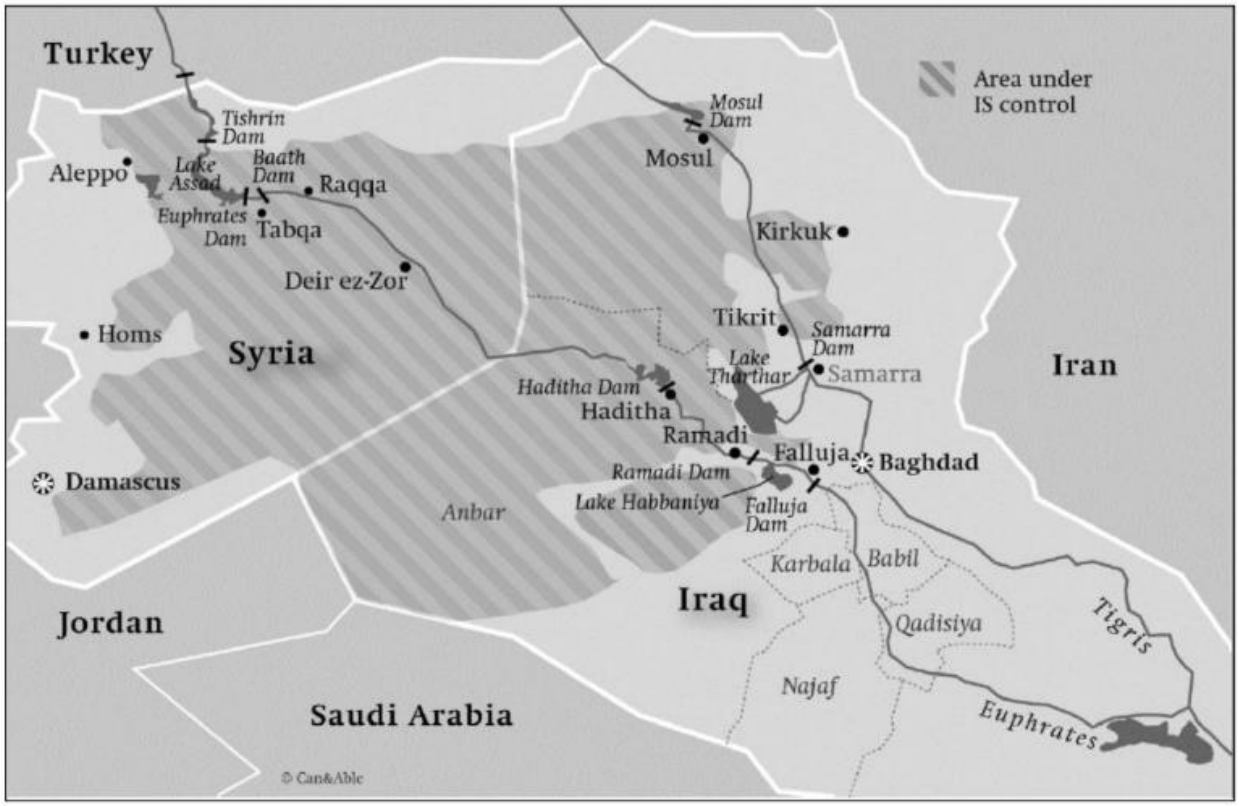
[2] See Tobias von Lossow, "Water as Weapon: IS on the Euphrates and Tigris: the systematic instrumentalisation of water entails conflicting IS objectives." German Institute for International and security affairs, January 2016 and Marcus DeBois King "The Weaponization of Water in Syria and Iraq," *The Washington Quarterly* 38, no. 4 (Winter 2016): 153-169.

[3] British Broadcasting Company (BBC), "Iraq Profile - Timeline," *BBC News*, 3 October 2018, https://www.bbc.com/news/world-middle-east-14546763.

[4] Hussein came to power in 1979.

Sunni insurgencies saw spikes in violence in 2008 and 2013.[5] By September of 2013, the extremist-Sunni terrorist group Islamic State (hereafter referred to by its Arabic acronym Da'esh) drastically intensified the violence in Iraq. At the height of Da'esh's power in Iraq, they controlled large areas of and critical infrastructure within the North and West of Iraq.

Figure 1: Da'esh Control in Iraq and Syria



Source: Tobias von Lossow, "Water as Weapon: IS on the Euphrates and Tigris: the systematic instrumentalisation of water entails conflicting IS objectives." German Institute for International and security affairs, January 2016.

In the fight against Da'esh, the Iraqi government and Kurdish forces saw unprecedented acceptance, as did several other militant groups. Da'esh or extremists following their ideology remain a valid fear in the region, but as of 2017 the group is largely under control in Iraq. Sectarian challenges, particular between the Kurdish populations and the government of Iraq, have resumed to some degree since then.[6]

As of this July, the population was estimated at 40 million people.[7] Ethnicity and religion in Iraq are not synonymous, but since the characteristics largely overlap, they

[5] BBC, "Iraq Profile - Timeline."

[6] BBC, "Iraq Profile - Timeline."

[7] "The World Factbook: Iraq," Central Intelligence Agency, last modified 3 December, 2018, https://www.cia.gov/library/publications/the-world-factbook/geos/iz.html.

are considered simultaneously in this paper. The majority ethno-religious population in Iraq is Shia, though Sunnis hold a powerful minority position socially and politically. A census has not been conducted since 1987 and any specific statistics on population estimates continue to be based on those figures, seen in summary below. These combined figures do not equal 100%, since there are several overlaps between ethnicity and religion and thus individuals may be considered within two different groups of the following percentages.

Figure 2: Ethno-religious Groups

Ethno-Religious Group	**Percent of Population**
Shia	64 - 69%
Sunni	29 - 34%
Kurdish (Kurds globally do not identify with any particular religion. Iraqi Kurds are predominantly Sunni Muslim.[8])	15 - 20%
Other, including Christian, Turkmen, Yezidi, Bedouin, Romani, and Persian	~ 5%

Source: "The World Factbook: Iraq," Central Intelligence Agency, last modified 3 December, 2018, https://www.cia.gov/library/publications/the-world-factbook/geos/iz.html.

Sunnis have been the ruling minority throughout recent decades. As of this publication, Iraq may have a different balance between ethno-religious leaders. A Shia political bloc holds the most Parliamentary seats; the Kurdish veteran and politician Barham Salih is the Parliament-elected President; and the appointed Prime Minister, Abel Abdul Mahdi, is Shia.[9]

Data Sources

Ethno-religious Data

I obtained data on ethno-religious groups from the University of Princeton-based Empirical Studies of Conflict (ESOC). Their dataset used the CIA ethnicity information as a baseline and estimated population numbers on the district level by combining it

[8] Besheer Mohamed, "Who are the Iraqi Kurds?" Pew Research Center, 20 August 2014, http://www.pewresearch.org/fact-tank/2014/08/20/who-are-the-iraqi-kurds/.

[9] BBC, "Iraq Profile - Timeline." However, see also Zmkan A. Saleem, "The Myth of Rising Above Sectarianism in Iraq," 20 April 2018, https://www.washingtoninstitute.org/fikraforum/view/the-myth-of-rising-above-sectarianism-in-iraq and Borzou Daragahi, "Welcome to Iraq's First Post-Sectarian Election," 10 May 2018, https://foreignpolicy.com/2018/05/10/welcome-to-iraqs-first-post-sectarian-election/ for conflicting analysis of these events.

with LandScan 2008 maps.[10] After many attempts to obtain ethno-religious data, it appears that most organizations' and researchers' data trace back to the CIA world factbook. The obtained data only considers the primary ethno-religious groups: Shia, Sunni, and Kurd. Several regions are indicated as "mixed" Sunni-Kurd or Sunni-Shia,[11] but mixed does not indicate inner-religious or cross-ethnic marriages. Rather, as can best be inferred from the data and codebook, it implies the numbers of each labeled population co-exist in the marked areas. Furthermore, the data included population counts for each region, but did not specify the percentage of each ethno-religious group within mixed areas.

Water Access Data

Through the United Nations International Children's Emergency Fund (UNICEF) Multiple Indicator Cluster Surveys,[12] I was granted access to the raw data of household level surveys from 1996, 2000, 2006, and 2011. The surveys included dozens of valuable information on the livelihoods, water and energy access, health, education, and safety of thousands of Iraqi families. For instance, the 2011 dataset contained 36,592 observations (number of households surveyed). While some statistical tests were run on other water-access related variables, such as time to source of main drinking water and how the water was treated, I focused heavily on how households obtained their main source of drinking water.

There are 18 governorates in Iraq. Governorates are equivalent to states with an administration level of 1. I was able to aggregate all the survey datasets on the governorate level. The 2011 dataset is particularly rich with information and extra analysis was conducted with these surveys. This dataset was disaggregated on the district level (administration level of 3). Observations in the survey typically identified 310 households per district, with 118 districts in total. This 2011 dataset is the only one with attributes available on the district level. Future research may derive more from previous years' data.

Violence Data

Data on violent events was obtained from the Global Terrorism Database, ESOC's Geo-referenced Worldwide Incidents Tracking System, and Uppsala University. Because of overlapping events, Uppsala's data was primarily used for the analysis. Specifically I used the dataset titled UCDP Georeferenced Event Dataset (GED) Global version 18.1 (2017), clipped for Iraq and the targeted years of 1991-2012 and 2013-2017.[13] The dataset records straightforward events, coded by the location (city level), category of the

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[10] "Ethnicity Study: District Level Ethnic Populations," Demographic/Socioeconomic, Empirical Studies of Conflict, accessed 25 September 2018, https://esoc.princeton.edu/files/ethnicity-study-district-level-ethnic-populations.

[11] No evidence of mixed Shia-Kurd areas were found.

[12] See http://mics.unicef.org/.

[13] Sundberg, Ralph, and Erik Melander, 2013, "Introducing the UCDP Georeferenced Event Dataset", Journal of Peace Research, vol.50, no.4, 523-532. Codebook at Croicu, Mihai and Ralph Sundberg, 2017, "UCDP GED Codebook version 17.1", Department of Peace and Conflict Research, Uppsala University. See http://ucdp.uu.se/downloads/.

perpetrator, and number of casualties. My analysis focused on the best estimate of the number of deaths associated with each event in the target year ranges.

Data Limitations

Publicly available data on where Iraqis live, disaggregated by ethno-religious identity, has not been updated in the recent past. The United Nations High Commissioner for Refugees and other organizations have given figures based on the origins of internally displaced persons and refugees which, when combined with death counts and available births numbers, can be used to estimate population changes. This is outside the capacities of my current project.

The water access datasets from UNICEF are rich in information. Being granted the raw data was a privilege which I hope this and the continued research I conduct with it honors and eventually advantages the families it represents. A limitation which I hope to improve on in continued research with the data is that the labeled districts do not correspond directly to current maps of the country. Tracking down which of the 118 districts from the UNICEF dataset correspond to the 104 districts on today's maps was, at the date of this publication, incomplete. As such, hundreds of household observations were excluded from the present analysis. I continue to make improvements and corrections moving forward in this project.

Conflict-related deaths are not the most quality measurement for the phenomenon of violence, but they are the best, most consistent way to measure it for the time being. More appropriate measures might be where combatants originated or how many people engaged in violence rather than only counting victims. Alternatively, proxies for measuring the receptiveness of individuals to extremism, based on the perpetrator's own values, might be a better measure of conflict. At the very least, selecting how to measure the phenomenon of violence skews perceptions of how to interpret this study. Since this study, and many others in peace and conflict, measures conflict in terms of its victims rather than in terms of its perpetrators, our mathematical results are fixed only on consequences of violence rather than adaptively seeking to understand the entire picture.

Hypothesis and Methodology

My hypothesis is that there is a link between violence on one hand, and water access & ethno-religious identity on the other hand, which may be stronger than ethno-religious identity alone.

After gathering the above data on as detailed of a level as possible and confirming each dataset's reliability, I began consolidating the relevant data in ArcGIS Pro in order to begin processing and determining spatial linkages in the nation. The geoprocessing tools of ArcGIS, particularly spatial joins and the capabilities of converting vector data to raster and vice versa, were critical in the ability to analyze these components. When the data was fully compiled and spatial joins complete, I was able to run statistical analysis on the data. I used both ArcGIS Geoprocessing (spatial analyst) tools and STATA for the analysis. Regressions were heavily used, as the correlations between the data types were

the most explanatory way to mathematically determine the relationship between the variables. I used the best estimate of the number of deaths in each district as my dependent variable. Each type of main source of drinking water and each primary ethno-religious group[14] were used as dependent variables. In ArcGIS Pro, exploratory regression analysis and geographically weighted analysis was run toward the latter end of the research.

Ethno-religious Identity and Water Access

There is anecdotal evidence that controlling access to water resources has previously been a tactic of state-based aggression in Iraq. President Hussein is known, for instance, to have deprived Shia populations of adequate water resources.[15] After a 1991 Shia uprising among the Arab Marshers, Hussein literally drained the swamp in which they lived, devastating both their livelihoods and the swamp ecosystem.[16]

Da'esh managed water resources as both a weapon and resource in a way no other group ever has. See the work of Marcus DeBois King, for instance, to see how Da'esh weaponized water resources, both offensively and defensively, in Iraq and Syria.[17] King reports how the terrorists also deprived non-Sunnis of water under their control or charged them a significantly higher rate for water than they did Sunnis. He says, "Water was suspended from Mosul's water purification plant to Christian minority villages on the outskirts of Mosul, including Qaraqosh and Bartalla. This action compelled residents to buy water at the rate of $6.25 USD per cubic meter instead, which is unaffordable to most residents. Water service was restored to Mosul by mid-June, and offered at discounted prices to the Sunni residents who returned to the city after [Da'esh's] initial seizure." Discriminatory trends such as this have largely disrupted water access nationally, and have damaged the agricultural production of the country.[18]

With these instances in mind, I sought to answer my first research question: *To what extent is the anecdotal evidence suggesting a link between ethno-religious identity and water access supported by empirical evidence?* With the current state of available data, I was unable to confirm how systematic this discrimination was from 1991-2012 nor to evaluate how effective the practices of Da'esh were for recruitment, but there are linkages between ethno-religious identity and types of water access.

Ethno-religious Findings

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[14] To clarify: one ethno-religious group was omitted at a time in each model, because of collinearity between the groups.

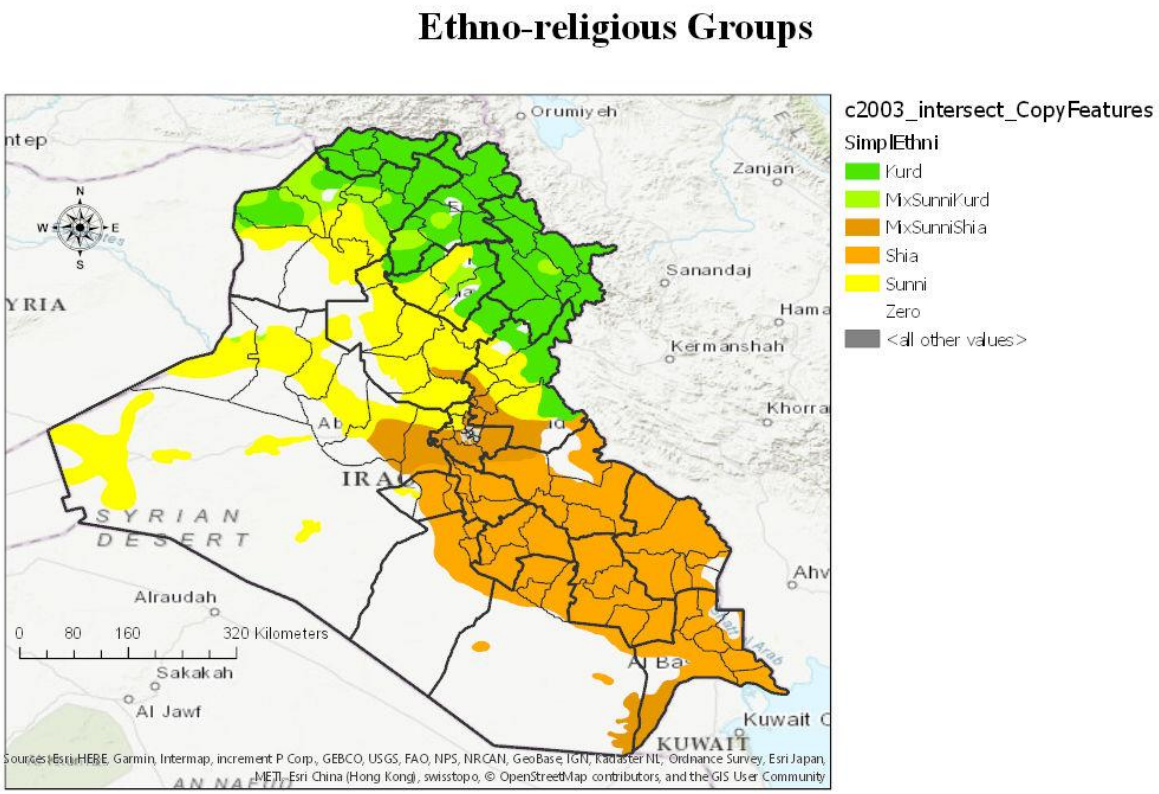
[15] Kevin Rosner, "Water and Electric Power in Iraq and Syria: Conflict and Fragility Implications for the Future," *Robert Strauss Center*, December 2016.

[16] Peter Schwartzstein, "Iraq's Famed Marshes Are Disappearing—Again, *National Geographic*, 9 July 2015, https://news.nationalgeographic.com/2015/07/150709-iraq-marsh-arabs-middle-east-water-environment-world/.

[17] Marcus DeBois King "The Weaponization of Water in Syria and Iraq.

[18] Callimachi, "The ISIS Files."

Map 1: Ethno-religious groups (2003, estimates made based on 1987 census)



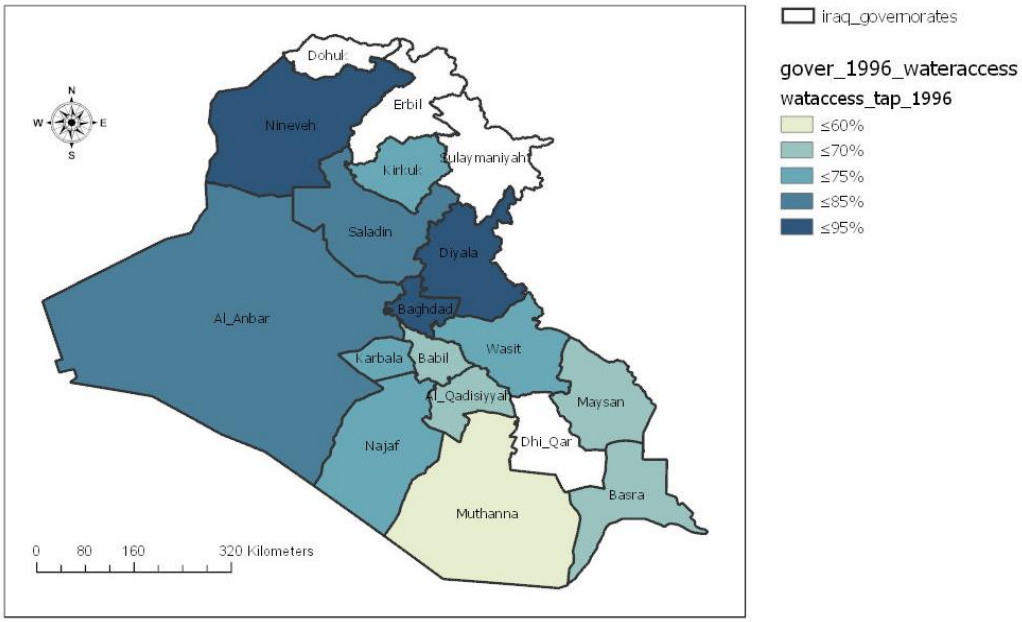
Access to Drinking Water by Type

Nationally from 2015, access to improved drinking water averages to 85.6% of the population, with urban access at 93.8 and rural access at 70.1%.[19] Looking more closely at how improved drinking water is accessed and the geographic distribution of water access by method of access on the district level paints a more inequitable picture, as can be seen in the following series of maps.

[19] CIA, "The World Factbook: Iraq."

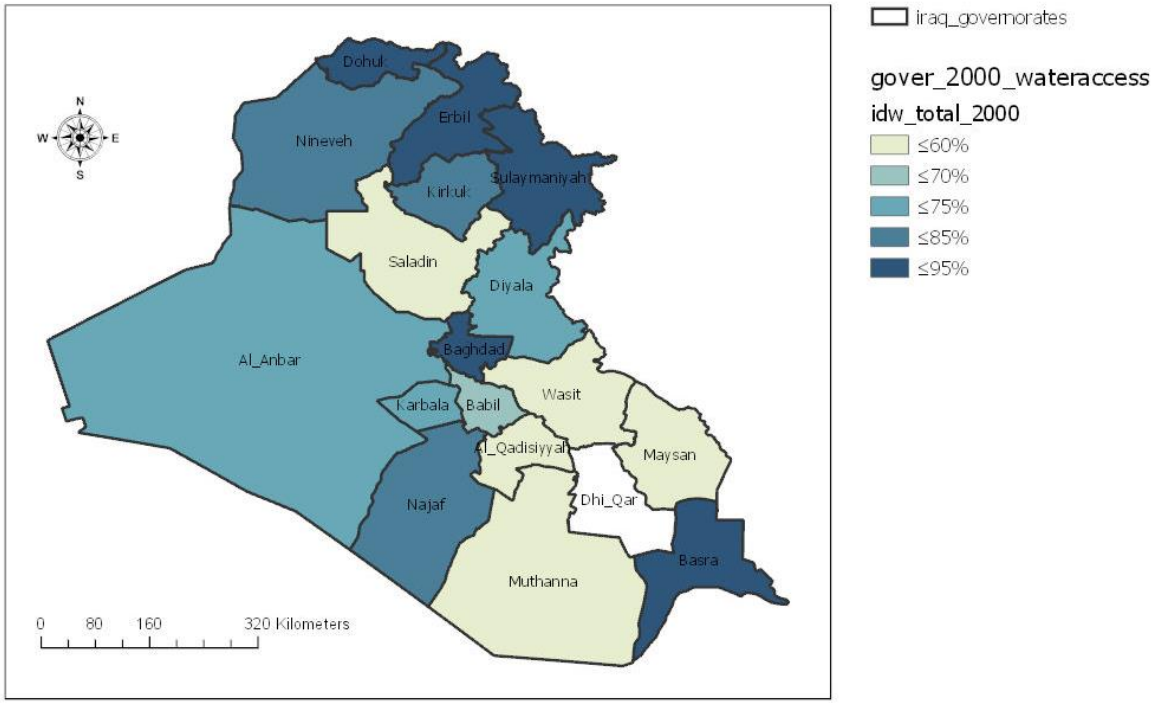
Map 2: Drinking water, total access (1996)

Drinking Water Access (Total 1996)

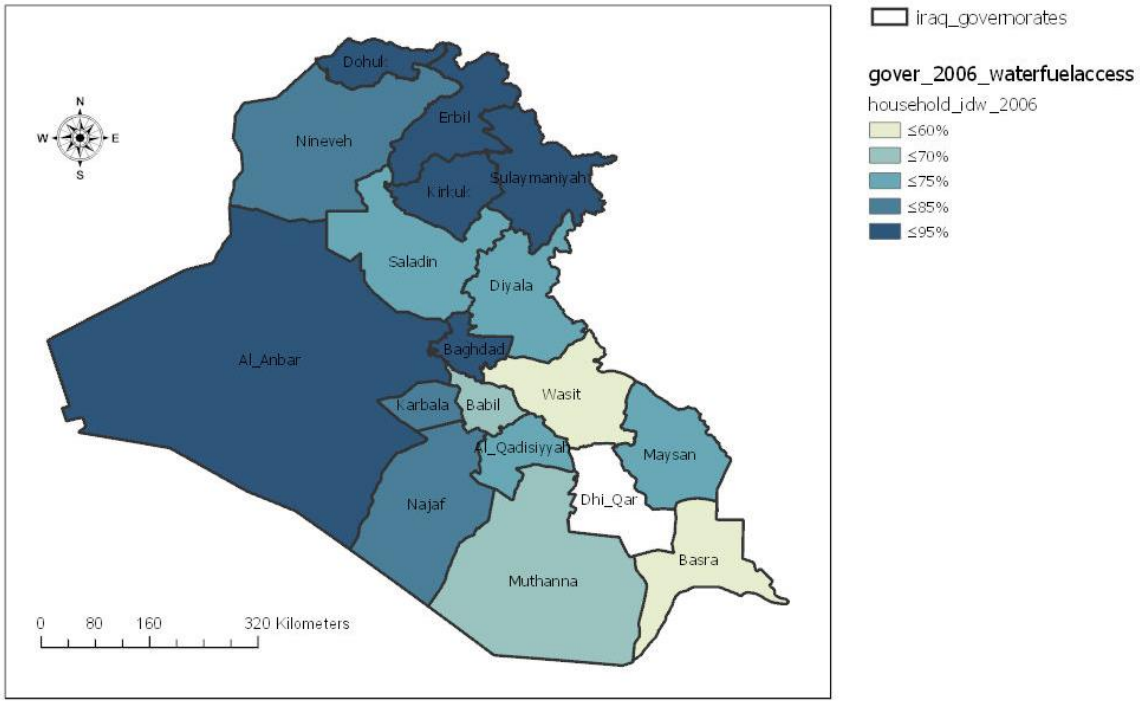


Maps 3: Improved drinking water, total access (2000-2011)

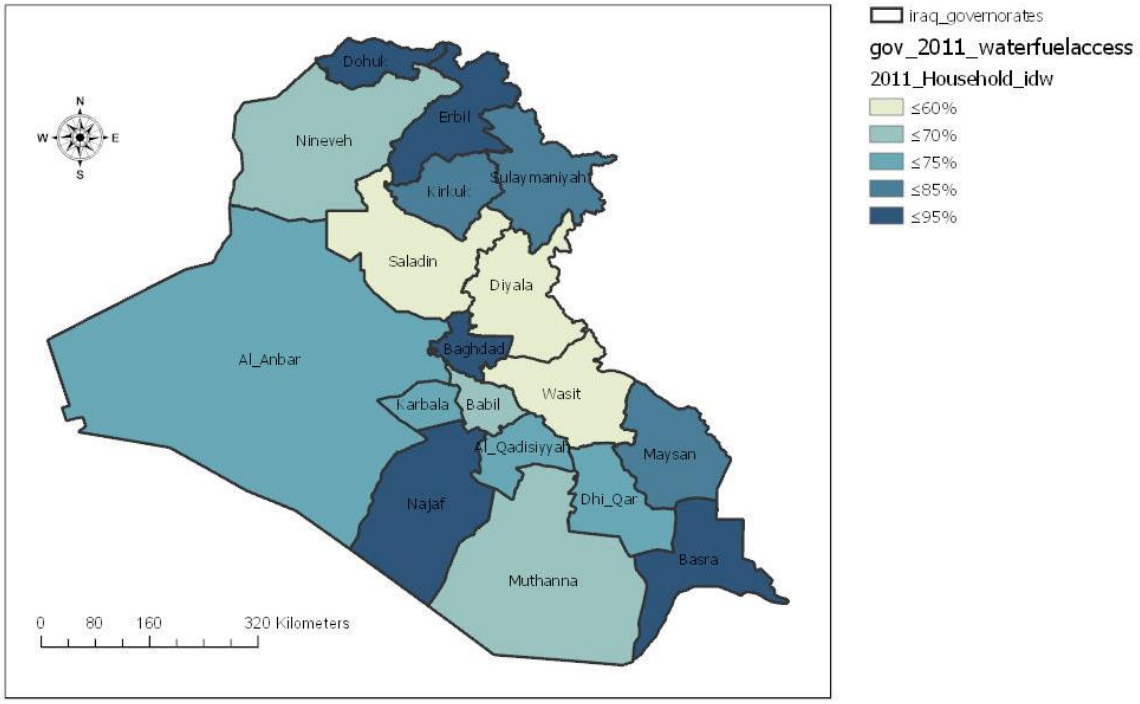
Improved Drinking Water (Total 2000)



Improved Drinking Water (Total 2006)

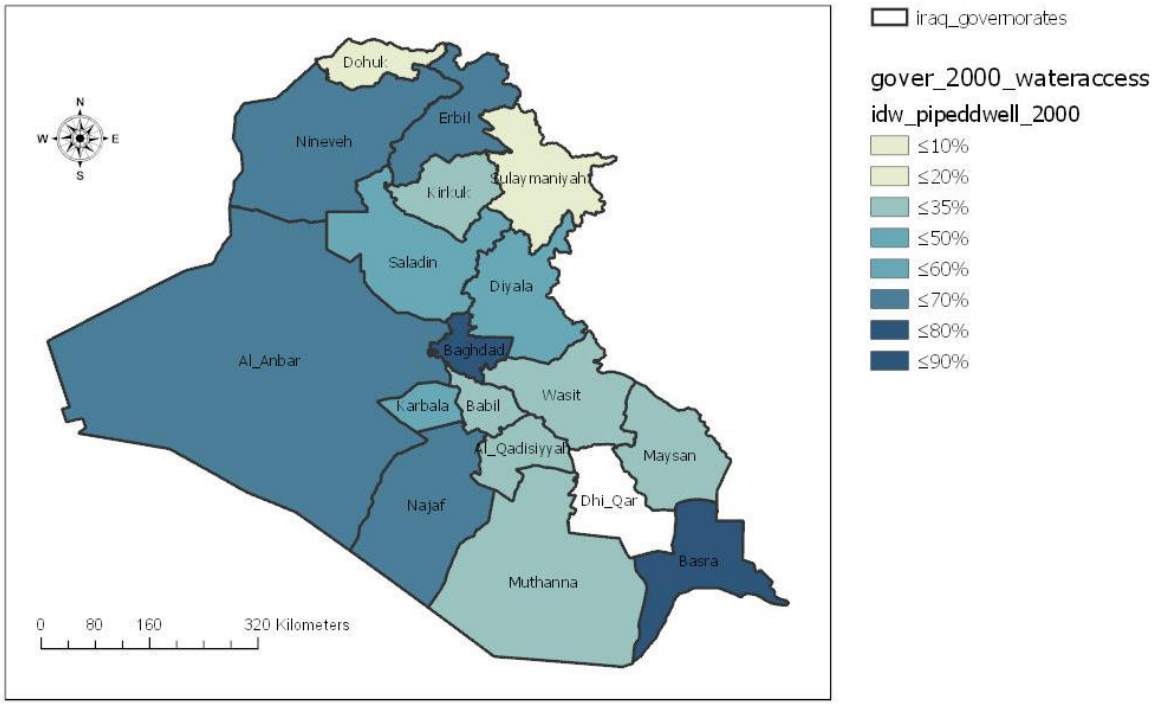


Improved Drinking Water (Total 2011)

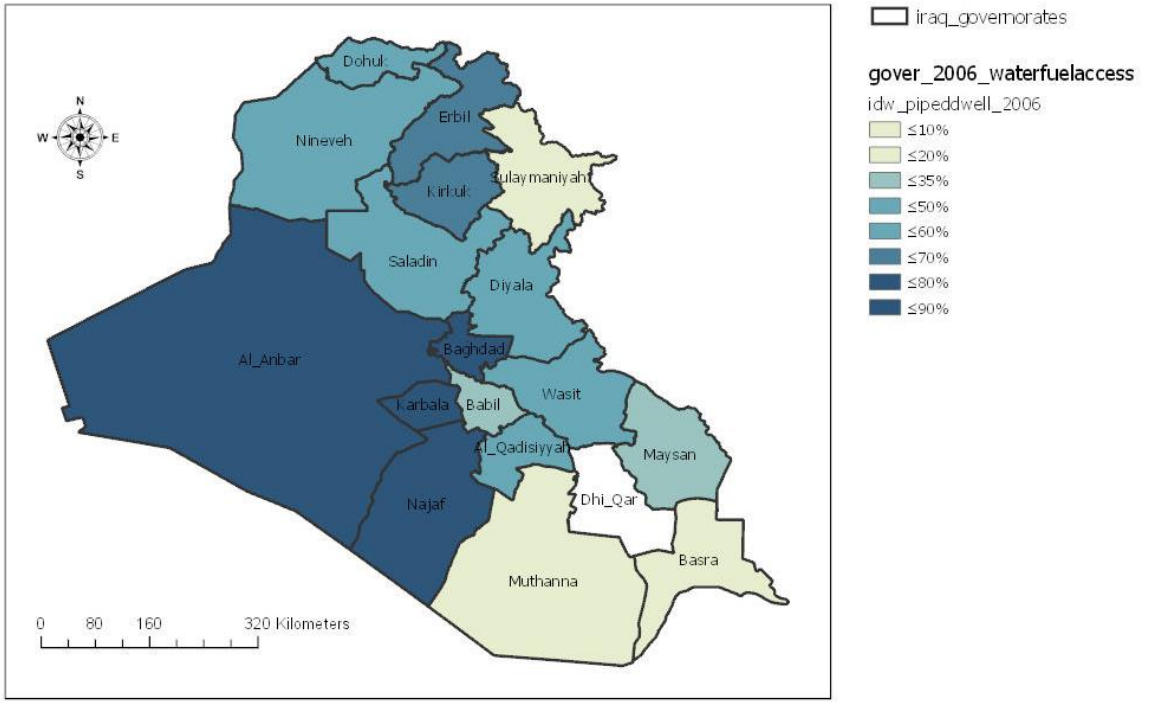


Maps 4: Improved Drinking Water, Piped into Dwelling (2000-2011)

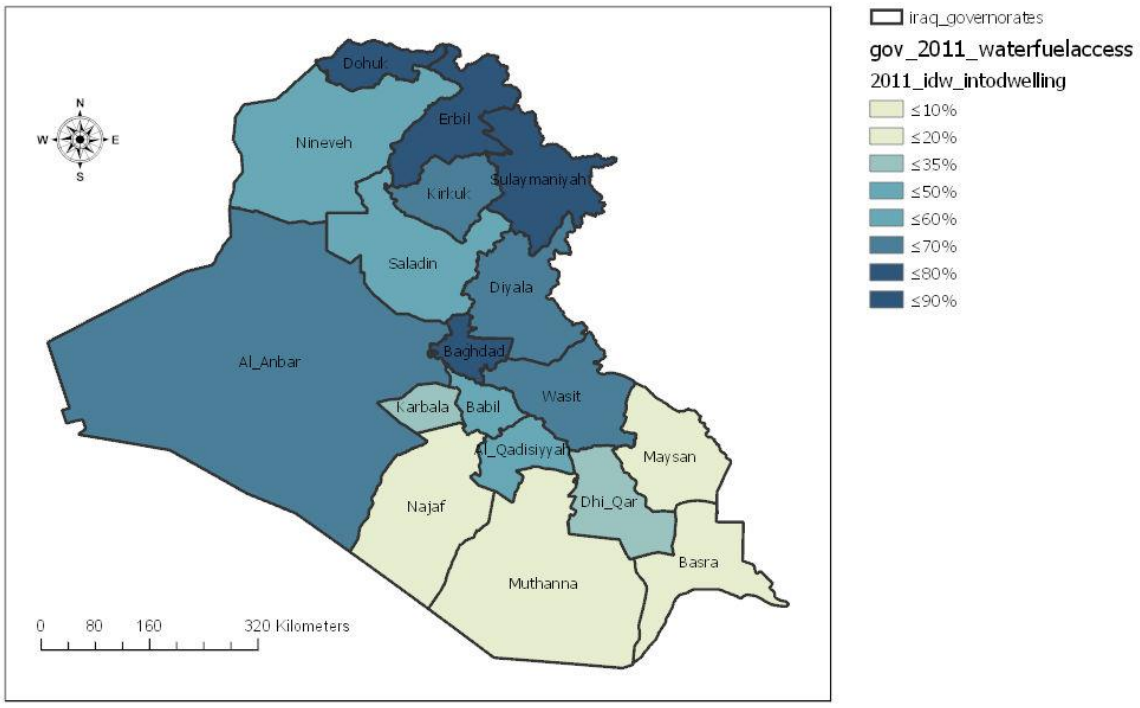
Improved Drinking Water Piped into Dwelling (2000)



Improved Drinking Water Piped into Dwelling (2006)

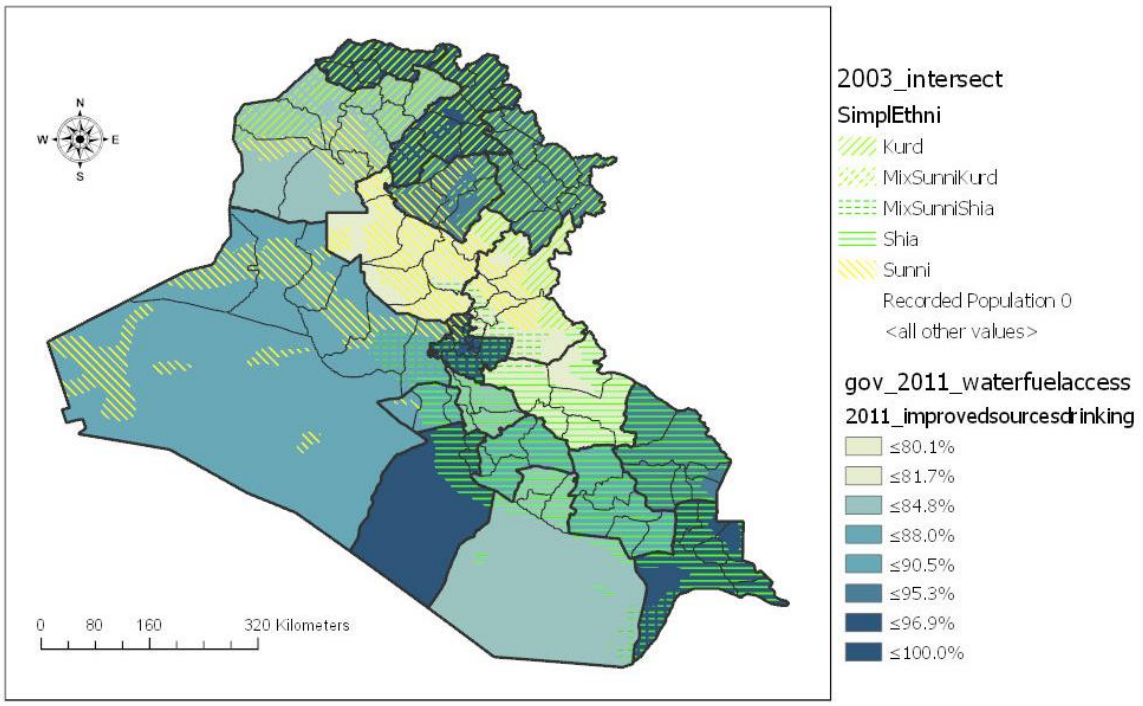


Improved Drinking Water Piped into Dwelling (2011)



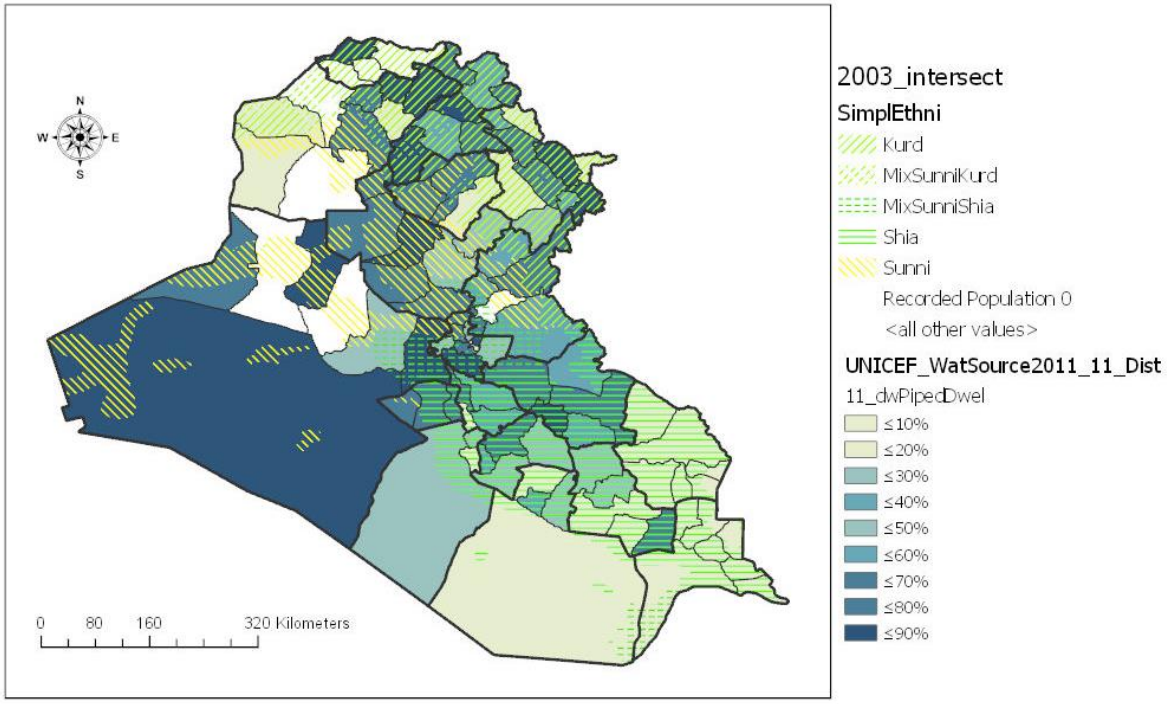
When looking at a more detailed view from the 2011 data, which collected household level surveys on the district level (administration level 3), a more nuanced picture of water access can be seen.

Map 5: Improved Drinking Water, Total Access, and ethno-religious groups (2011)



Map 6: Main source of drinking water is improved and piped into dwelling, with ethno-religious groups (2011)

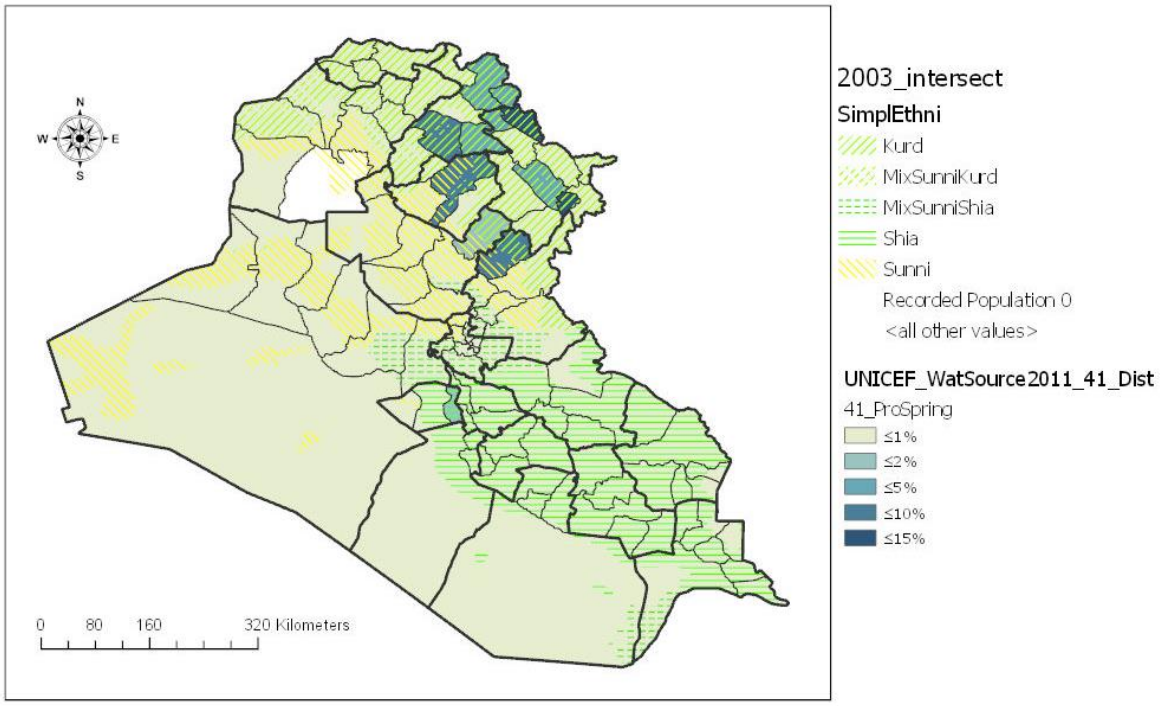
Improved Drinking Water (Piped into Dwelling) 2011



Of the models which will be presented in the Key Findings section, the most statistically significant correlation came from the percent of the Kurdish population whose main source of drinking water came from protected springs. The map is thus included below.

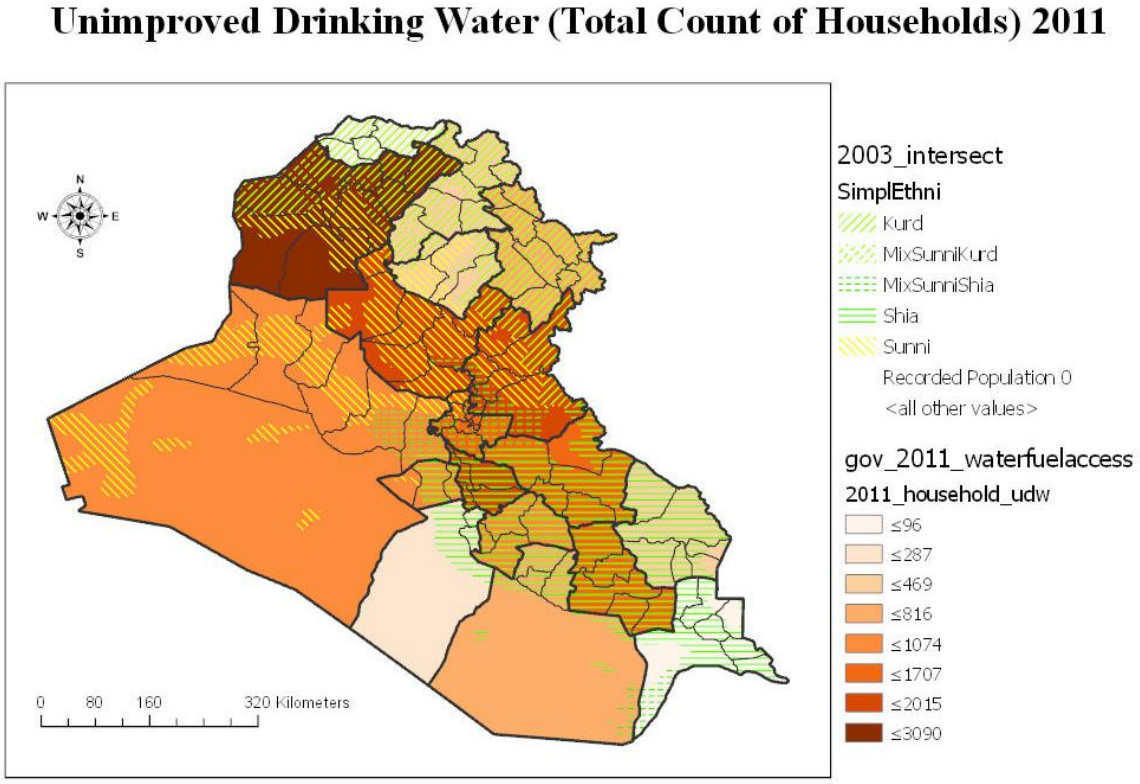
Map 7: Main Source of Drinking Water is a Protected Spring

Improved Drinking Water (Protected Spring) 2011



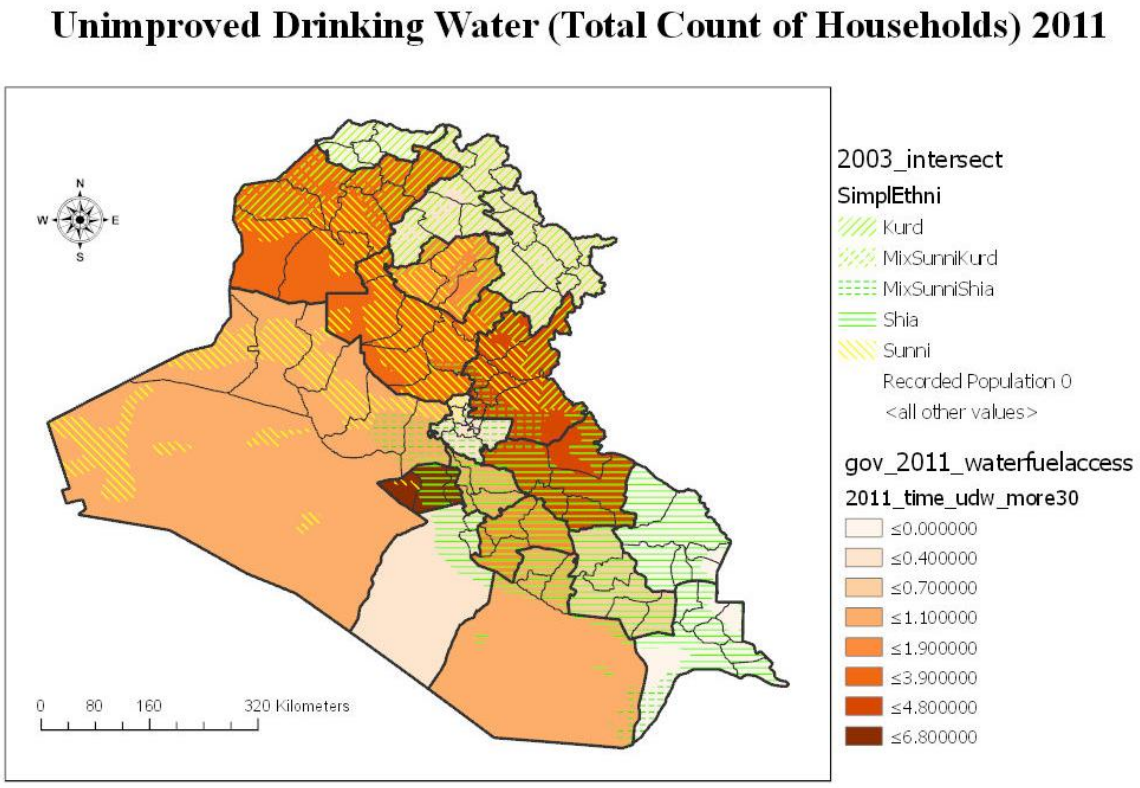
The following maps show a very small percentage of the Iraqi population. However, I found it worth noting that this population continues to exist, even national access to improved water source being at 86.6%, since they are located in regions where water access to improved drinking water overall is not low.

Map 8: Number of household members in households using unimproved drinking water sources (2011)



This percentage of the population travels at least 30 minutes in order to access *unimproved* drinking water.

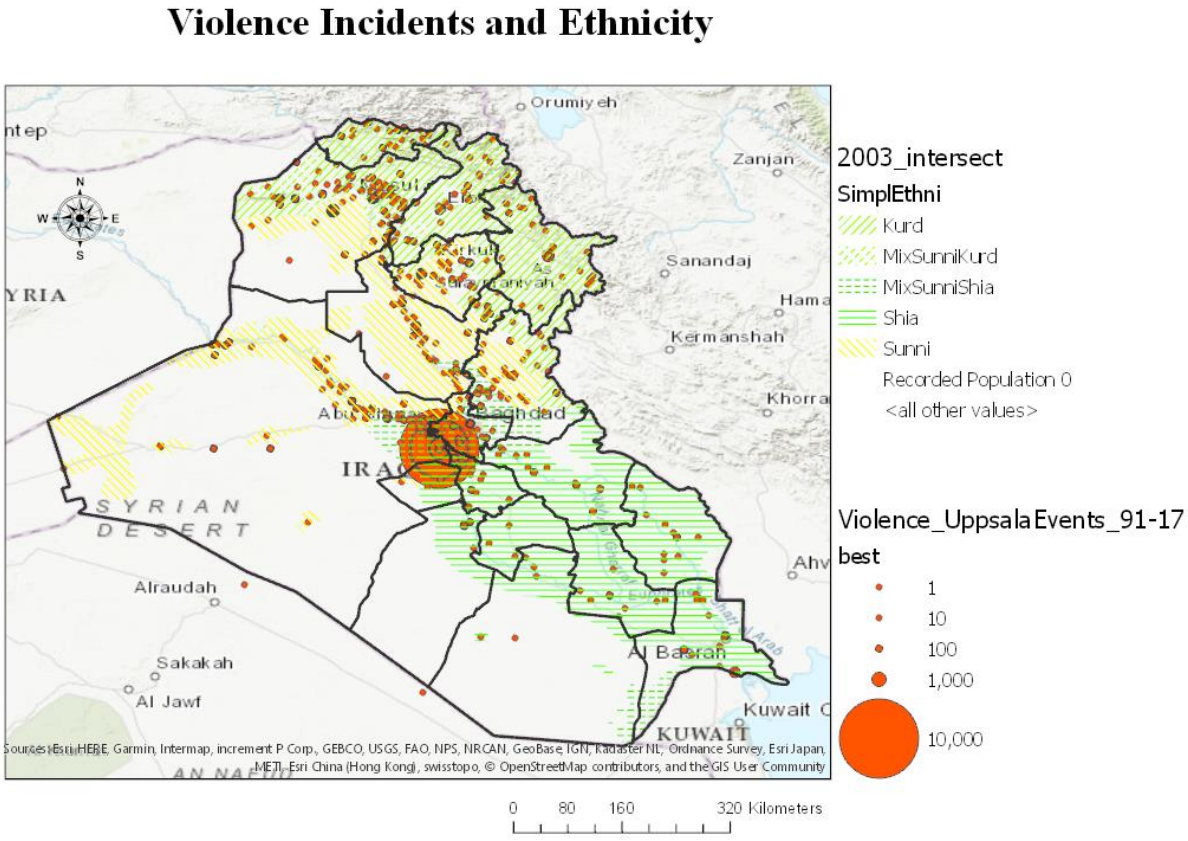
Map 9: Time to source of drinking water, users of unimproved drinking water sources, 30 minutes or more (2011)



Links to Violence

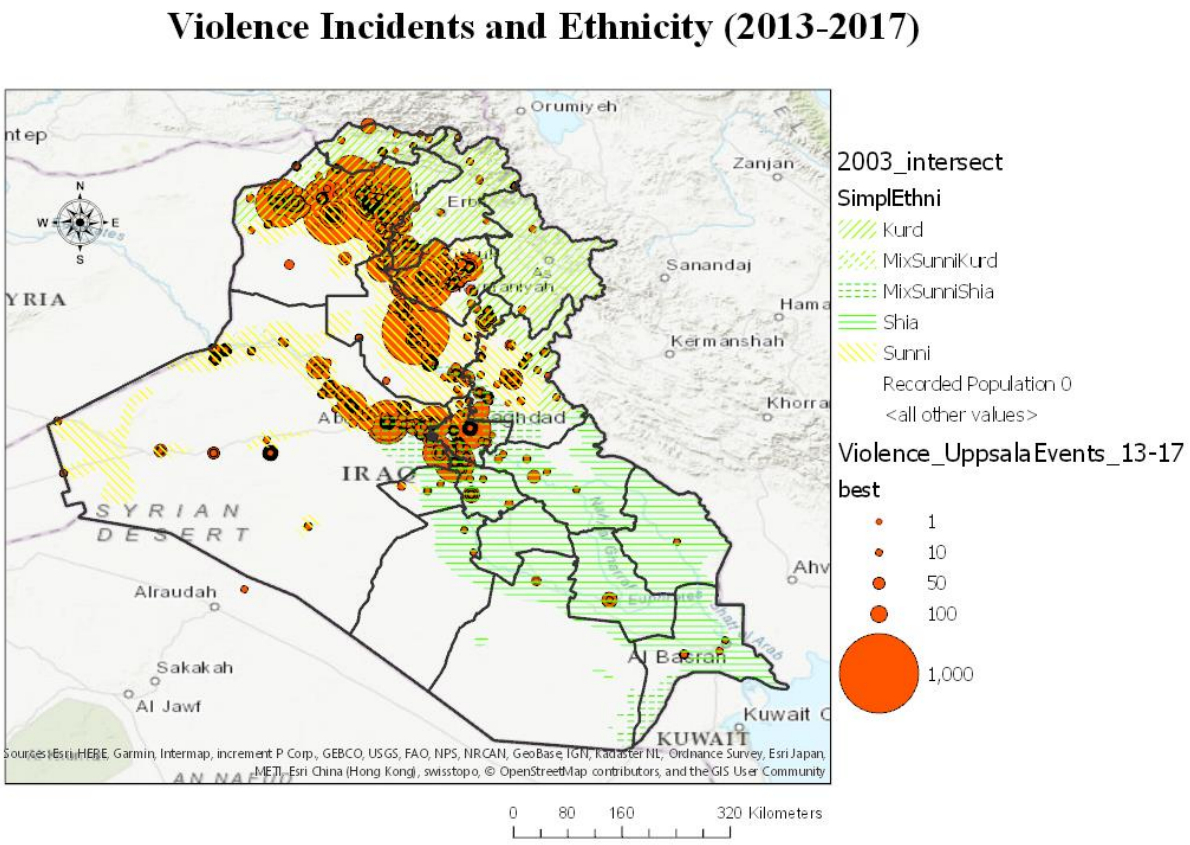
As previously noted, 1991 is significant in Iraq's history because this marks the end of the Gulf War and sparks of internal, sectarian-related violence within Iraq. This paper looks at the brief timeline beginning in 1991. From 1991 to 2012, the best estimate of deaths related to conflict were concentrated in and around the capital, Baghdad.

Map 10: Estimates of death count and ethno-religious identity from 1991 to 2012



While violent events steadily grew throughout the decades, in 2011, Iraqis experienced an extremist Sunni uprising and Da'esh advanced into Iraq the same year. Compared to the previous time period, the death count has decreased in the south and significantly increased in the north. Baghdad remains a hotspot for violence, but it is no longer an outlier with the severe attacks throughout the north.

Map 11: Estimates of death count and ethno-religious identity from 2013 to 2017



Having gathered this data and aggregated the violence events on the district level, I sought to answer the second research question: *How are ethno-religious groups and water access related to incidents of violence post-1991 and post-2013?* My research has not been able to confirm with certainty how systematic the assertions of how the state and Da'esh may have used discriminatory water access, but neither has my research been able to reject this notion with current data. The following statistical relationships are worth noting in this and further research.

Conclusion

Key Statistical Findings

As mentioned in the methodology, my hypothesis is that there is a link between water access and ethno-religious identity which corresponds with violence. The relevance of sectarian concerns is widely noted, but I sought to test if the combination of water access and ethno-religious identity may be stronger than ethno-religious identity alone. After processing the above relevant data by location, I tested my hypothesis using multivariate regression analysis.

Figure 3: Multivariate regression analysis on the central hypothesis

Source	SS	df	MS		
				Number of obs	= 103
				F(18, 84)	= 2.36
Model	80202672.2	18	4455704.01	Prob > F	= 0.0045
Residual	158572230	84	1887764.64	R-squared	= 0.3359
				Adj R-squared	= 0.1936
Total	238774902	102	2340930.41	Root MSE	= 1374

SUM_best	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
UNICEF_WatSource2011perc_F11_dwP	-8123.354	5847.199	-1.39	0.168	-19751.15	3504.443
UNICEF_WatSource2011perc_F12_dwP	-8196.752	6002.136	-1.37	0.176	-20132.66	3739.154
UNICEF_WatSource2011perc_F13_dwP	-9094.682	25607.64	-0.36	0.723	-60018.27	41828.91
UNICEF_WatSource2011perc_F14_dwP	2935.453	8569.336	0.34	0.733	-14105.61	19976.52
UNICEF_WatSource2011perc_F21_dwB	14938.37	9335.61	1.60	0.113	-3626.512	33503.26
UNICEF_WatSource2011perc_F31_dw_	-6144.793	6306.906	-0.97	0.333	-18686.77	6397.182
UNICEF_WatSource2011perc_F32_dwU	48720.68	53509.84	0.91	0.365	-57689.5	155130.9
UNICEF_WatSource2011perc_F41_Pro	-33942.5	14257.46	-2.38	0.020	-62295.02	-5589.977
UNICEF_WatSource2011perc_F42_Unp	37146.45	43993.5	0.84	0.401	-50339.45	124632.4
UNICEF_WatSource2011perc_F51_Rai	226382.1	346724.8	0.65	0.516	-463118.1	915882.4
UNICEF_WatSource2011perc_F61_dwT	-8578.021	5694.426	-1.51	0.136	-19902.01	2745.969
UNICEF_WatSource2011perc_F71_dwC	-6190.875	8447.375	-0.73	0.466	-22989.41	10607.66
UNICEF_WatSource2011perc_F81_dwS	-11534.6	6121.948	-1.88	0.063	-23708.76	639.5667
UNICEF_WatSource2011perc_F91_dwB	-7621.676	5733.596	-1.33	0.187	-19023.56	3780.208
UNICEF_WatSource2011perc_F92_dwR	-8098.693	5707.381	-1.42	0.160	-19448.45	3251.061
prop_kurd	-1612.915	475.2004	-3.39	0.001	-2557.903	-667.9268
prop_shia	-843.9043	532.412	-1.59	0.117	-1902.664	214.8554
total_pop	-.0012468	.0011407	-1.09	0.277	-.0035151	.0010215
_cons	9166.919	5603.597	1.64	0.106	-1976.448	20310.29

$$Y_{Conflict} = 9167 - 8123 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ piped\ into\ dwelling} - 8196 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ piped\ into\ compound,\ yard,\ or\ plot} - 9095 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ piped\ to\ a\ neighbor} + 2935 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ being\ a\ public\ tap\ or\ standpipe} + 14938 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ being\ from\ a\ tube\ well\ or\ borehole} - 6145 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ being\ a\ protected\ well} + 48721 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ being\ an\ unprotected\ well} - 33943 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ being\ a\ protected\ spring} + 37146 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ being\ an\ unprotected\ spring} + 226382 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ through\ rainwater\ collection} - 226382 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ by\ tanker\ truck} - 6191 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ by\ a\ cart\ with\ small\ tank\ or\ drum} - 11535 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ being\ surface\ water} - 7622 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ by\ bottled\ water} - 8099 * X_{\%\ of\ district's\ population\ with\ improved\ drinking\ water\ by\ reverse\ osmosis} - 1613 * X_{proportion\ of\ Kurdish\ population\ in\ the\ district} - 844 * X_{Proportion\ of\ Shia\ population\ in\ the\ district} - 0.001 * X_{total\ population\ count}$$

The importance of the relationship

Aggregating violent events to the district level and overlaying information about water access, I discovered a statistically significant relationship between methods of water access and ethno-religious identity, at a 95% confidence level. At first glance of figure 3, the 19.36% goodness of fit value (the adjusted R^2) may seem useless, especially in comparison to goodness of fit values found in some hard sciences. I argue however, that this value is important and worth attention.

Conflict is complicated. There are never just two causes to any conflict, even relatively "simple" and non-violent conflicts. Of course, correlation not causation. One cannot say (and I do not argue) that these factors *cause* near 20% of conflict-related deaths.

However, for a situation such as the decades-long turmoil in Iraq, with the devastation of Da'esh in particular, the fact that these two aspects explain 19% of the variation in conflict-related deaths is worthy of note. Perhaps more importantly, *the model yielded a higher R^2 than either (1) type of water access or (2) ethno-religious group did on each of their own*. I also argue that the 95% confidence level is a high standard for this research, since harms caused by type II errors could be more detrimental in this subject than type I errors, in this case such would be failing to consider how the method of water access and ethno-religious identity correspond with violence.

Summary

In this research, I hope that the data I have and continue to process for relational trends can, in any way, contribute to wider efforts of identifying priority areas or priority peoples within the Iraqi population for whom specific efforts could be targeted for impacting the peacebuilding processes. I have sought to understand the potential relationship between the method of water access, ethno-religious identity, and violence in Iraq through the following research questions:

1. *To what extent is the anecdotal evidence suggesting a link between ethno-religious identity and water access supported by empirical evidence?*
2. *How are ethno-religious groups and water access related to incidents of violence post-1991 and post-2013?*

Journalists and scholars often reference the sectarian nature of conflict in Iraq, and my research seeks to wrestle with this understanding, to confirm and expand upon it. My findings are incomplete and ongoing, but initial results have discovered a relationship between these components which explains 19% of the variation in conflict-related deaths. This is a small piece, but I hope to continue expanding on the rich data compiled for this research in order to, eventually, contribute toward Iraq's peace process.