Water weaponization in the Syrian conflict: strategies of domination and cooperation

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Since the dawn of agrarian society, humans have fought over water and used water to fight, channelling hydraulic resources in both offensive and defensive military strategies. In the fifth century BCE the Chinese Zhou dynasty built dams to submerge their aggressors; in the fourth century CE, the Sasanians vanquished the Roman Emperor Julian the Apostate on the banks of the Tigris through a mixture of controlled flooding and guerrilla warfare, ending Roman hegemony in the Fertile Crescent.[1] Later, Europeans mastered inland waterways to spread colonial rule to the Americas through the Amazon, Mississippi and St Lawrence rivers, to Africa through the Nile, and to Asia through the Yangzi Jiang. Cooperation over water also yielded the first international agreements in human history. Over 5,000 years ago, the Sumerian cities of Umma and Lagash fought over their shared use of the Euphrates; the parties settled the conflict with the world's first treaty, ensuring Lagash's exclusive access to the river's water.[2]

Today, scholars and policy-makers alike continue to debate the societal impact of water-sharing. Existing approaches focus on the role water plays in either driving conflict or fostering cooperation between states. An extensive literature has conceptualized water as a factor driving conflict, particularly in interstate interactions.[3] More recently, the debate has been expanded in two crucial respects. First,

[1] L. J. del Giacco, R. Drusiani, L. Lucentini and S. Murtas, 'Water as a weapon in ancient times: considerations of technical and ethical aspects', *Water Science and Technology: Water Supply* 17: 5, 2017, pp. 1490–98.

[2] Stephen McCaffrey, 'Water scarcity: institutional and legal responses', in Edward H. P. Brans, Esther J. de Haan, André Nollkaemper and Jan Rinzema, eds, *The scarcity of water: emerging legal and policy responses* (London: Kluwer Law International, 1997), p. 43.

[3] On conflict between riparian states, see Miriam Lowi, *Water and power: the politics of a scarce resource in the Jordan river basin* (Cambridge: Cambridge University Press, 1993). For population growth pressures, scarcity and conflict, see Thomas Homer-Dixon, 'Environmental scarcities and violent conflict: evidence from cases', *International Security* 19: 1, 1994, pp. 5–40; Peter H. Gleick, 'Water and conflict', *International Security* 18: 1, 1993, pp. 79–112. On how structural power and bargaining influence hydroconflicts, see Marwa Daoudy, 'Asymmetric power: negotiating water in the Euphrates and Tigris', *International Negotiation* 14: 2, 2009, pp. 361–91; Mark Zeitoun and John Anthony Allan, 'Applying hegemony and power theory to transboundary water analysis', *Water Policy* 10: 2, 2008, pp. 6–7. On the securitization of climate-induced migration in the Middle East, see Erika Weinthal, Neda Zawahri and Jeannie Sowers, 'Securitizing water, climate change and migration in Israel, Jordan and Syria', *International Environmental Agreements* 15: 3, 2015, pp. 293–307.

a new focus includes identifying incentives for and benefits from cooperation over natural resources through market pricing and resource substitution, including uses of 'virtual water'.[4] This approach has been based largely on ideas associated with technological innovation, market pricing and mutual regimes. Other potential tools for addressing water security include the establishment of international water law, river authorities and international cooperation bodies.[5] Second, the literature shows that water resources turn into powerful tools of warfare more frequently in intrastate than in interstate confrontations.[6] As discussed later in this article, states use water systems as weapons by transforming them into military tools and targets during military operations.[7] Non-state actors resort to similar strategies to further their interests and pursuit of domination.[8]

While these contributions are important, I posit that situating water as a source of *either* conflict *or* cooperation obfuscates the complex role it plays in the dynamics of conflict. Existing frameworks on the role of water in conflict have failed to grapple fully with the question of cooperation *during* violent conflict. Moreover, the literature on water weaponization remains chiefly concerned with its immediate effects on military and political developments, rather than interrogating the ways in which water systems are constructed as weapons through historical processes that define how actors deploy them in times of conflict. More broadly, while scholars of civil war have long argued that state and non-state actors can strike bargains during periods of conflict on matters of territorial control and governance, less attention has been paid to tacit arrangements on resources, and how these arrangements in turn come to be instrumentalized as weapons in complex multifaceted conflicts.[9] Thus the following questions arise: Could opposing state and non-state actors cooperate over water resources and systems while engaged in warfare? What forms could such cooperation take? If bargains are made, what impact do they have on our understanding of water weaponization? Could resources and systems be channelled as weapons in the absence of violent conflict? In this article, I ask these questions in the case of Syria. Specifically, I assess how state and non-state actors have weaponized water resources before and during the conflict that began in 2011, and conclude that they did so through four distinct strategies. My analysis sheds light on interactions between the central state and the emergent Kurdish-affiliated Democratic Union Party (PYD), including its military wings (the Kurdish People's Protection Units, YPG, and the Women's Protection Unit, YPJ), in the Kurdish areas of the Hassake governorate (informally known as the Jazira province in north-

[4] John A. Allan, *The Middle East water question: hydropolitics and the global economy* (London: Tauris, 2001).
[5] Ken Conca, *Governing water: contentious transnational politics and global institution building* (Cambridge, MA: MIT Press, 2006); Paul R. Hensel, Sarah McLaughlin Mitchell and Thomas Sowers, 'Conflict management of riparian disputes', *Political Geography* 25: 4, 2006, pp. 383–411.
[6] Peter Gleick and Matthew Heberger, 'Water conflict: events, trends and analysis', in Peter Gleick, ed., *The world's water*, vol. 8: *The biennial report on freshwater sources* (Washington DC: Island, 2013), pp. 159–71 at pp. 159, 162, 168.
[7] Gleick and Heberger, 'Water conflict', p. 160.
[8] Marcus DuBois King, 'The weaponization of water in Syria and Iraq', *Washington Quarterly* 38: 4, 2017, pp. 153–69.
[9] Paul Staniland, 'States, insurgents, and wartime political orders', *Perspectives on Politics* 10: 2, 2012, pp. 243–64.

1348

east Syria), and between the central state and the Islamic State in Iraq and Syria (ISIS).

In doing so, I construct a new typology of water weaponization strategies that: (1) accounts for the ways in which state policies of water control in times of peace both constitute a form of water weaponization and shape how water is deployed in later conflicts; (2) appraises the dual offensive–defensive capabilities of water, which allow state and non-state actors alike to inflict damage beyond the capacity of conventional military tactics; and (3) considers the weapon-like effects of water cooperation. Rather than being opposite or adjacent, the notions of water weaponization, water as a source of domination and water as a source of cooperation are instead *integral* mechanisms of weaponization in their own right. Though Lagash and the Sasanians may have extracted their water victories by different means, even in ancient times water weaponization and water cooperation were two sides of the same coin.

The following section begins with an overview of how the literature categorizes water in relation to conflict. I then present my new typology of water weaponization to address the gaps I identify.

Water typologies: conflict over water or water as a weapon of war?

Typologies of different strategic uses of water show how access to water can represent a potential political tool, a material source of power, a weapon during wars and a means of violence for terrorist groups.[10] For example, in the context of the Israeli–Palestinian conflict, Weinthal and Sowers show how state and non-state actors have targeted water, agriculture and the energy sector.[11] More broadly, typologies on the relationship between water and violence typically take on two related forms: one focused on the nature of conflict, and the other on weaponization. One conflict typology distinguishes religious and development disputes (involving state and non-state actors), control of water resources (state and non-state), terrorism (non-state), military (state) and political tools (state and non-state), and military goals and targets.[12] Gleick and Heberger modify this framework to comprise military tools (state actors), military targets (state), terrorism or domestic violence including cyberterrorism (non-state), and development disputes (state and non-state actors).[13]

Zeitoun and colleagues criticize this approach, pointing out how the highly subjective categorization of 'terrorism' creates a redundant form of classification, and instead stress the importance of analysing discriminate versus indiscrimi-

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[10] Jeroen Warner, 'The struggle over Turkey's Ilısu dam: domestic and international security linkages', *International Environmental Agreements: Politics, Law and Economics* 12: 3, 2012, pp. 231–50; Gleick, 'Water and conflict'; Gleick and Heberger, 'Water conflict'; Homer-Dixon, 'Environmental scarcities and violent conflict'; Peter H. Gleick, 'Water and terrorism', *Water Policy* 8: 6, 2006, pp. 481–503.

[11] Erika Weinthal and Jeannie Sowers, 'Targeting infrastructure and livelihoods in the West Bank and Gaza', *International Affairs* 95: 2, March 2019, pp. 319–40.

[12] Pacific Institute, *Water conflict chronology*, 2015, http://www2.worldwater.org/conflict/list/. (Unless otherwise noted at point of citation, all URLs cited in this article were accessible on 11 June 2020.)

[13] Gleick and Heberger, 'Water conflict'.

1349

nate destruction.[14] Independent of intentions, however, grave impacts on human welfare are brought about by damaged environmental infrastructures, which Sowers and colleagues define as 'systems of providing water, energy, waste, and sanitation that sustain human livelihoods and well-being'.[15] Thus, when seeking to analyse the role of water in conflict, typologies of weaponization provide a more useful avenue for analysis than typologies that aim to classify patterns of conflict, which pay too much attention to types of actors and too little attention to political outcomes and human cost. Indeed, as the following sections illustrate, state and non-state actors—irrespective of whether the 'terrorist' label is applied—behave in remarkably similar fashions in their violent instrumentalization of water.

Yet even when scholars disambiguate forms of water weaponization, the 'terrorist' label persists as an ambiguous term whose definition could equally apply to state strategies. In his typology of water weaponization, DuBois King lists 'strategic, tactical or unintentional weaponization', 'psychological terrorism' and 'incentivization'.[16] Gleick positions weaponization within environmental terrorism, which 'involves targeting natural resources for a political, social or economic objective'.[17] Further distinctions are also made between direct and indirect attacks on hydroinfrastructure, with examples of the latter including contamination through pathogens.[18] Others have noted the capture of the Tabqa and Fallujah dams by ISIS in 2013 and 2015 as evidence of the increased targeting of water systems by non-state actors.[19] Yet these actions do not fit neatly into either the 'direct' or the 'indirect' model of weaponization. The group employed water resources to serve both military and state-building ambitions through a variety of means that did not always entail the destruction or sabotage of water systems.

The literature poses two more conceptual issues. First, these perspectives are deterministic, and imply fixed outcomes that ignore local realities. On the one hand, intrastate disputes about water can take place beyond the context of violent conflict. On the other, engagements concerned with water tend to happen within mixed bargaining processes that oscillate between conflict and cooperation over time.[20] Acknowledging this point, Zeitoun and Mirumachi note that complex interactions over water cannot fall neatly into a category of either 'conflict' or 'cooperation'.[21] Furthermore, these perspectives fail to take a wider historical perspective that appraises how modalities of water weaponization in conflict are rooted in systems of water weaponization in times of peace. Finally, all

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[14] Mark Zeitoun, Karim Eid-Sabbagh and Jeremy Loveless, 'The analytical framework of water and armed conflict: a focus on the 2006 Summer War between Israel and Lebanon', *Disasters* 38: 1, 2014, pp. 27–30.

[15] Jeannie Sowers, Erika Weinthal and Neda Zawahri, 'Targeting environmental infrastructures, international law, and civilians in the new Middle Eastern wars', *Security Dialogue* 48: 5, 2017, pp. 410–11.

[16] DuBois King, 'The weaponization of water in Syria and Iraq'.

[17] Gleick, 'Water and terrorism', p. 484.

[18] Gleick, 'Water and terrorism', p. 484.

[19] Sowers et al., 'Targeting environmental infrastructures', pp. 410–30.

[20] Daoudy, 'Asymmetric power'. This article demonstrates that parties to a negotiation process over water-sharing still cooperate even in the context of highly conflictual interactions.

[21] Mark Zeitoun and Naho Murimachi, 'Transboundary water interaction I: reconsidering conflict and cooperation', *International Environmental Agreements: Politics, Law and Economics* 8, 2008, pp. 305, 309. The authors argue that conflict and cooperation over water happen simultaneously.

1350

existing typologies avoid interrogating how water cooperation may also produce violence. Therefore, a new typology of weaponization that addresses these gaps is required.

My research contributes to the literature by identifying four interrelated strategies of water weaponization which focus on control over resources and infrastructures: *domination and legitimacy*; attack and capture of large infrastructures (*military target and goal*); cutting off water, deliberate flooding and defensive fortification (*military tool*); and delivery or denial of basic infrastructure-generated services (tool of *cooperation*). This new typology draws on existing concepts from Gleick,[22] and employs DuBois King's definition of weaponization as 'a means of gaining advantage or defending oneself in a conflict or contest … an item, action, offensive capability, or mechanism used or intended to kill, injure, or coerce',[23] with the aim of transcending the conceptual limitations of existing frameworks.

First, state actors deploy water resources and infrastructures as weapons of *domination and legitimacy*. In their interactions with populations, they frame water as a symbol of identity and a mechanism of power consolidation, largely because of its value as a source of livelihood. Non-state actors use similar strategies to legitimize their control, often anchoring rival claims in the very same infrastructure. This nexus highlights the importance of taking a broad temporal perspective when examining how actors in a particular conflict have legitimized their power with water. This notion of infrastructure as a weapon elaborates on Michael Mann's concept of 'infrastructural power'.[24] While infrastructural power maps out the coercive and inducive effects of a government's ability to centralize information and decision-making, and penetrate civil society,[25] I draw attention to how the function of water systems in advancing state or non-state legitimacy and domination can be transferable among actors in civil conflict. In particular, how a state historically employs its infrastructural power to dominate a population may accentuate its dependence on water systems, thereby allowing non-state actors to advance towards their goals rapidly by capturing these systems. Second, water is weaponized as a *military target*. When water systems are damaged or destroyed, they unleash destructive power that allows forces to inflict damage on populations beyond the reach of their conventional capacities. Third, water infrastructure is weaponized as a *military tool*. A state or substate actor may use water assets already in their control or after capture to terrorize populations, elicit concessions from opponents or directly support tactical goals in the course of a military action. Finally, water *cooperation* in times of conflict is itself a form of weaponization, both in the harm it can cause to civilian populations and its ability to advance military objectives. My case-studies chart how, in the context of the internationalized Syrian civil war, cooperation over water between ISIS and the Syrian government occurred at direct cost to the American-sponsored Syrian Democratic Forces

[22] Gleick, 'Water and terrorism', p. 160.
[23] DuBois King, 'The weaponization of water in Syria and Iraq', p. 155.
[24] Michael Mann, 'The autonomous power of the state: its origins, mechanisms, and results', *European Journal of Sociology* 25: 2, 1984, pp. 185–213.
[25] Mann, 'The autonomous power of the state', pp. 189–90.

1351

(SDF). As such, testing instances of water cooperation *during* conflict within the framework of weaponization strategies clarifies its strategic and human implications. Moreover, it is important to keep in mind that in all four of these types, water can be both an offensive and a defensive weapon, furthering an actor's own objectives and/or hampering those of opposing forces.

The following section sets out the background of the Syrian civil war and the two non-state actors of interest to this study, the PYD and ISIS. I continue with two thematic case-studies to examine how various actors deployed these water weaponization strategies in Syria. The first case compares the policy of the prewar Syrian government policy to that of ISIS during the conflict to explore water weaponization as *domination* while also illustrating how historical water strategies shape future conflicts both ideationally and materially. This case draws on primary and secondary sources on Syria's history and politics. The second case presents an analysis of water weaponization during the conflict as a combination of target, tool and form of cooperation involving the Syrian government, ISIS and the PYD. The post-2011 analysis builds on statements and reports issued through state and public networks, as well as interviews carried out with knowledgeable experts from Syria. In both case-studies, I draw on the leaked 'ISIS papers', visual media and other forms of digital marketing used by the terrorist organization to gain influence with local populations.

State and non-state actors in the Syrian conflict

The post-2011 conflict in Syria paved the way for a new role for emerging and competing non-state actors such as the PYD and ISIS. The Islamic State in Iraq (ISI), later self-labelled the Islamic State of Iraq and Levant (ISIL), ISIS or the Islamic State, emerged in 2004 with affiliations to Al-Qaeda.[26] While ISIS' use of violence in pursuit of its goals qualifies the group as a 'terrorist' organization, the international US-led coalition with Russia against ISIS legitimized the use of violence by the PYD's military branch (YPG) within the framework of the American-sponsored and PYD-dominated SDF in northern Syria. Between 2015 and the withdrawal of American troops in 2019, the PYD became the main pillar of the US military strategy against ISIS. An example of this collaboration was the successful expulsion of ISIS from Raqqa in October 2017, which came with profound humanitarian costs for local populations. ISIS' claims to political and religious legitimacy posed a unique type of threat to the international community, whose response, some argue, has been ambiguous and ill-defined.[27]

This fact creates a complex set of questions around matters of legitimacy, power and control of resources during the Syrian conflict. Both the PYD and ISIS displayed state-building ambitions by challenging regional borders dating back to the Sykes–Picot plan for partition of the Ottoman empire in 1916. Consequently,

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[26] Mathieu Rey, 'The origins of the Islamic State', *Books and Ideas* (Paris: Collège de France, 21 May 2015), https://booksandideas.net/The-Origins-of-the-Islamic-State.html.

[27] Asaf Siniver and Scott Lucas, 'The Islamic State lexical battleground: US foreign policy and the abstraction of threat', *International Affairs* 92: 1, Jan. 2016, pp. 63–79.

1352

three key events framed the weaponization of water resources during the war: the unilateral proclamation of an autonomous region of Western Kurdistan in north and north-east Syria in 2013; ISIS's public declaration of the 'Islamic State' on 29 June 2014, accompanied by the launch of massive campaigns to conquer large swathes of land and water infrastructures; and the capture by ISIS of the Tishrin and Tabqa dams in Syria in 2012 and 2013, and their recapture by the US-supported and PYD-dominated SDF in 2017.

The anti-government protests in Syria starting in March 2011 and the subsequent repression by the Assad regime dealt a major setback to the relationship between Syria and Turkey.[28] Paradoxically, in view of Syria's history of Arabizing the Kurdish-populated Jazira, the Damascus government and the PYD, the Syrian affiliate of the Kurdistan Workers' Party (Partiya Karkaren Kurdistan, PKK), have, in the process, turned into de facto allies in the face of a common enemy: Turkey. The Assad regime withdrew its forces from the Kurdish-populated north-eastern parts of the country, giving the PYD more freedom locally.[29] In November 2013, the PYD established effective military and administrative control in three border areas (Afrin, Kobani and Jazira) in north-east Syria and in March 2013 declared an autonomous Western Kurdistan (Rojava) region. This unilateral move reflected the accelerated territorial and political fragmentation of the country into different geographical entities controlled by various armed groups, contributing significantly to the transformation of Syria's post-2011 borders.[30]

From the beginning of the Syrian conflict, all of these actors resorted to a range of strategies in their weaponization of water resources. These strategies, summarized schematically in figure 1 (p. 1354) and described in detail in table 1 (p. 1366), ranged from military attacks on water infrastructures to the capture of major hydroelectric dams (military targets and goals), cutting off the distribution of drinking water (military tools) and the flooding of land (military tools). These actions fall under the category of 'discriminate/targeted' acts and constitute a non-warring form of weaponization of resources. These tactics have become a critical new aspect of the conflict between state and non-state actors in Syria. In a later section of this article I will show how cooperation also took place in relation to water services, for example in the delivery of hydroelectricity by ISIS to the Syrian capital, and the provision by the PYD of access to drinking water in regime-controlled areas in the north-east. Before examining these strategies in greater detail, the following section will show how both the Ba'athist regime in Syria and ISIS pursued similar strategies of legitimation and domination using water.

[28] Marwa Daoudy, 'The structure–identity nexus: Syria and Turkey's collapse', *Cambridge Review of International Affairs* 29: 3, 2016, pp. 1074–96.

[29] Syria supported the PKK insurgency against the Turkish state from 1984 until 1998 during the years of confrontation with Turkey over the Euphrates and Tigris rivers. This support was leveraged to bring upstream Turkey to an agreement over minimal allocations. Syria allegedly resumed its support for the PKK after 2011. See Daoudy, 'Asymmetric power'; Daoudy, 'The structure–identity nexus'.

[30] Leila Vignal, 'The changing borders and borderlands of Syria in a time of conflict', *International Affairs* 93: 4, July 2017, pp. 809–27.

Figure 1: Types of control over water: ISIS, PYD and Syrian government
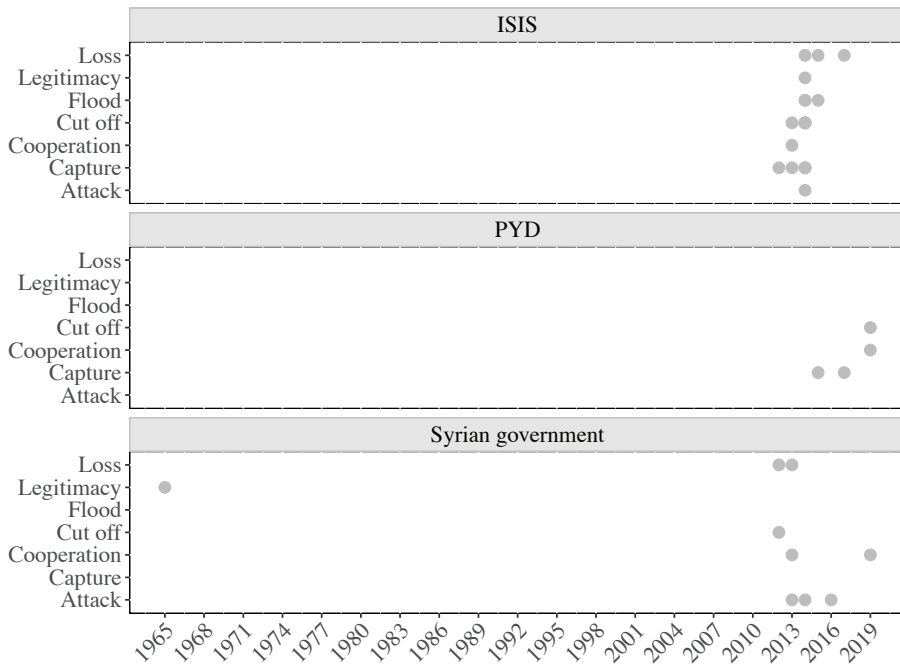
Water as a weapon of domination and legitimacy: from Ba'athism to ISIS

In their quest for domination, both the Syrian government and ISIS leveraged water resources as a weapon. This section outlines the complexity of water politics and state power in Syria since the 1960s as a basis for discussing the implications of these policies as a mechanism of legitimacy that became transferable to ISIS following its invasion of north-east Syria. Beginning in the 1960s, newly empowered Ba'athist elites implemented intensive dam construction and irrigation projects, especially in the north-eastern rural Jazira province, home to much of the country's Kurdish population and the majority of its water and agricultural resources. These water projects and land policies, dictated by ideological and strategic concerns, displaced villagers in the Euphrates basin and excluded Syrian Kurds from the benefits of the agrarian reforms. In combination with later neo-liberal development policies that favoured investment and economic diversification projects largely in western urban centres, Jazira's continued dependence on agriculture allowed ISIS later to weaponize water as a tool of legitimacy and domination in similar fashion during its occupation of the Syrian north-east.

Using the provision of access to water as a form of political legitimacy constituted an integral part of the Ba'ath Party's strategy to maintain political support while integrating new leaders in the decade prior to Hafez al-Assad's rise to power

in 1970. From 1963, as a rural intelligentsia displaced the traditional urban leadership, the Ba'ath Party sought to cater to new interests and constituencies.[31] The prioritization of food security justified large-scale water projects. These plans focused on the most important river in the country, the Euphrates, whose basin contains over 65 per cent of the country's water resources. In official discourse, projects such as the Tabqa dam on the Euphrates, begun in 1968, were a 'cornerstone in the construction of a solid economic base'.[32] Its construction served several purposes: the elimination of flood risks, the irrigation of enhanced agricultural land and the production of electrical power. The discourse surrounding these projects conflated water security with political power and legitimacy in Syria, and was later amplified by propaganda under Hafez al-Assad that highlighted the leader's peasant origins.[33] These initiatives had critical implications for the capacity of the Syrian state to weaponize agricultural resources and land policy as a tool of political and demographic domination, with a particular impact on the Syrian Kurds.

The government's water infrastructure projects coincided with the 'Arab Belt'/ encirclement plan that began in 1965. The policy codified the Arabization of Kurdish areas as the Syrian government sought to change the demographics of the Jazira province and prevent further inward Kurdish migration.[34] Policies under the French Mandate, and migrants from Turkey during the period of agricultural reform under the United Arab Republic (1958–61), had brought waves of Kurdish migration to the north-east of Syria between 1938 and 1962.[35] Now the government sought to solve the 'Kurdish question' through the displacement of thousands of Kurds in the 'Arab Belt'—a strip of 3 million acres in northern Jazira. In 1962, the Syrian Ministry of Interior conducted a census in the Jazira province which resulted in major losses of citizenship and civil rights for Kurds.[36]

Ba'athist discourses were central to the policies that excluded Kurds from agricultural gains: the Ba'ath Party justified these policies with reference to Arab nationalism and sought to increase Arab influence in northern regions under the pretext of land reform.[37] The government built villages on expropriated Kurdish lands while excluding Kurds from the redistribution of public land.[38] Intensive irrigation and dam-building projects were critical tools in this process—the consequent flooding would displace villagers in Kurdish areas. The construction of the Tabqa dam alone led to the evacuation, sometimes by force, of 60,000 inhabitants of the 43 villages submerged by the reservoir which began filling in 1973.

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[31] Robert W. Olson, *The Ba'ath and Syria, 1947 to 1982: the evolution of ideology, party, and state, from the French Mandate to the era of Hafiz al-Assad* (Princeton: Kingston, 1982), p. 86.`

[32] 'Étude mensuelle économique, politique et statistique: le Barrage de l'Euphrate par l'ingénieur Sobhi Kahhaleh, ministre du barrage de l'Euphrate', *Syrie et Monde Arabe* 25: 290, 1978, p. 1.

[33] Jessica Barnes, 'Managing the waters of Ba'ath country: the politics of water scarcity in Syria', *Geopolitics* 14: 3, 2009, p. 521.

[34] Arab Centre for Research and Policy Studies (ACRPS), *The question of the Syrian Kurds: fact, history, myth* (Beirut, 2013), pp. 27–8. This book (in Arabic) provides a unique collection of studies and perspectives by Syrian and Arab experts on the question of the Syrian Kurds.

[35] ACRPS, *The question of the Syrian Kurds*, pp. 27–8.

[36] ACRPS, *The question of the Syrian Kurds*, pp. 36, 155.

[37] ACRPS, *The question of the Syrian Kurds*, pp. 35.

[38] ACRPS, *The question of the Syrian Kurds*, pp. 30–32.

1355

After Bashar al-Assad succeeded his father in 2000, the regime's neo-liberal policies privileged urban and coastal economic development at the expense of the countryside, increasing the north-east's economic precariousness. This, in combination with the government's failure to modernize wider networks of irrigation systems, left the region's undiversified agricultural economy heavily dependent on large water systems.[39]

The dams located on the Euphrates, concentrated in the provinces of Raqqa and Deir-ez-Zor, became the most critical for the country's irrigation and electricity development. In 2004, Syrian Kurdish activism re-emerged when parts of the population rebelled in the Hassake governorate. (Later, after the 2011 uprisings, many of the Kurdish groups joined opposition forces.[40]) In 2008, the government resumed the 'Arab Belt' initiative. Buying or selling property in the area became forbidden to everyone except those with connections to the state elite.[41] Consequently, water represented a tool that legitimized new societal arrangements promoted by the Ba'ath Party while also serving as a weapon of domination that sought to resolve the Syrian 'Kurdish question'.

To fully appreciate the effects of the regime's use of water for self-legitimation and domination, it is important to assess how these policies shaped the ability of a non-state actor such as ISIS rapidly to establish legitimacy in the same region during the civil war. In 2014, the declaration by ISIS of the 'Islamic State' carved out a wholly new task for the former Al-Qaeda splinter group: defining and defending itself in territorial and state-like terms. As a newly emergent non-state actor trying to portray itself as a legitimate state entity, ISIS deployed a multifaceted power strategy focused on hard power and exercised through control over supply of oil, water and hydroelectricity. The picture grows even more complex when we take account of practices, whether explicit or implicit, that delineate the use of resources as a source of both domination and legitimacy. This phenomenon manifested itself further in ISIS' weaponization of water resources at the macro level to consolidate its legitimacy through infrastructural power, and as a means of domination over local communities.

Until its recent losses at the hands of the international coalition, the self-proclaimed 'Islamic State' levied taxes from subjugated populations; it also minted its own currency, the 'golden dinar', for the trade in oil.[42] ISIS' capture of key hubs of regional water systems—Mosul and Haditha (Iraq) in 2014; Tishrin in 2012; Tabqa in 2013—allowed the group to capitalize on the Syrian regime's historical exercise of infrastructural power to gain a base of legitimacy in the Syrian

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[39] For a comprehensive discussion of the economic and environmental vulnerabilities of the Syrian north-east, see Marwa Daoudy, *The origins of the Syrian conflict: climate change and human security* (Cambridge: Cambridge University Press, 2020).

[40] Myriam Ababsa, 'The end of a world: drought and agrarian transformation in north-east Syria', in Raymond Hinnebusch and Tina Zintl, eds, *Syria from reform to revolt* (Syracuse, NY: Syracuse University Press, 2015), p. 217; Julie Gauthier, 'The struggle for unity and relevance, 2003–2008: has the Kurdish question erupted in Syria?', in Fred H. Lawson, ed., *Demystifying Syria* (London: Saqi, 2009), p. 119; Jordi Tejel, 'Les Paradoxes du printemps Kurde en Syrie', *Politique Étrangère* 79: 2, 2014, pp. 51–61.

[41] Ababsa, 'The end of a world', p. 217.

[42] Interview with Lisa Daftari, *The Foreign Desk*, 6 July 2016.

north-east.[43] ISIS also used water supply to control the arid Euphrates valley, where agriculture depends on irrigation networks. The non-state actor displayed the same bureaucratic attributes as previous central authorities had done, levying taxes and imposing the selection of crops on farmers through a new Department of Agriculture.[44] Alongside oil, taxation, looting and foreign donations, agriculture became a valuable source of revenues for the group in 2014–15.[45] With little investment having been made by the Syrian government in the Jazira province beyond agricultural infrastructure, the group was able to use its network of newly captured dams to control the vast majority of economic activity in the region and continue agricultural production in north-eastern Syria and parts of Iraq at rates comparable to those pertaining before its invasion.[46]

In addition to weaponizing critical infrastructures as a tool of legitimacy, ISIS also implemented routine security practices towards local populations. The leaked 'ISIS papers' revealed how the group controlled the provision of water services after conquering Raqqa in January 2014 by threatening the population with significant fines and punishments in the event of electricity theft and evasion of water taxes.[47] ISIS also withheld water access until newly occupied areas accepted their authority, at times depriving 5 million inhabitants in Aleppo and Raqqa of access to safe water.[48]

ISIS' revisionist agenda included the resort to ideational power through a mobilization of narratives and appeal to identity aimed at recruiting and financing new forces. In parallel to these practices, the group was active in creating and disseminating propaganda through social media, videos, online magazines, pamphlets and posters.[49] These performative acts were specifically aimed at convincing regional and international audiences of the 'existential threat' faced by Sunni Muslims in order to boost recruitment and strengthen the group's image as an effective, self-sufficient 'state'.[50] In using the control and mobilization of resources as key pillars of its regional power projection and ideological outreach, ISIS triggered an 'ideational security dilemma', setting off a bidding war between itself and the Syrian state elites in which both sides sought to win people's hearts and minds, and framed their policies in existential terms.[51]

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[43] Hadi H. Jaafar and Eckart Woertz, 'Agriculture as a funding source of ISIS: a GIS and remote sensing analysis', *Food Policy* 64, 2016, p. 16.

[44] Fabrice Balanche, *Water issues are crucial to stability in Syria's Euphrates valley*, Policywatch 2622 (Washington DC: Washington Institute for Near East Policy), 26 May 2016, https://www.washingtoninstitute.org/policy-analysis/view/water-issues-are-crucial-to-stability-in-syrias-euphrates-valley.

[45] Jaafar and Woertz, 'Agriculture as a funding source of ISIS', pp. 4–25.

[46] Jaafar and Woertz, 'Agriculture as a funding source of ISIS', p. 16.

[47] Interview with Christiaan Triebert, *Bellingcat*, 14 April 2016.

[48] Strategic Foresight Group, *Water and violence: crisis of survival in the Middle East* (Mumbai, 2014), p. v.

[49] Monica Maggioni and Paolo Magri, *Twitter and jihad: the communication strategy of ISIS* (Milan: Italian Institute for International Political Studies, 2015); Simone Molin Friis, '"Beyond anything we have ever seen": beheading videos and the visibility of violence in the war against ISIS', *International Affairs* 91 : 4, July 2015, pp. 725–46.

[50] Rey, 'The origins of the Islamic State'; Manni Crone, 'It's a man's world: carnal spectatorship and dissonant masculinities in Islamic State videos', *International Affairs* 96 : 3, May 2020, pp. 573–91 ; Constance Duncombe, 'Social media and the visibility of horrific violence', *International Affairs* 96 : 3, May 2020, pp. 609–29.

[51] Lawrence Rubin, *Islam in the balance: ideational threats in Arab politics* (Stanford, CA: Stanford University Press, 2014).

1357

This section has illustrated the importance of considering the weaponization of water in a broad historical context that takes account of the symbolic and material power of water systems to advance the legitimacy and domination of state or substate actors. The Syrian regime weaponized water offensively along these lines to dispossess the Kurds, while also directly benefiting the elites that took power in the 1960s. These policies, combined with neo-liberal development priorities under Bashar al-Assad, centralized the infrastructural power of the state, providing ISIS with the material tools to assert its own domination and legitimacy in the Syrian north-east. The following sections now turn to the other strategies deployed during the Syrian conflict as water became a strategic tool, target and goal, reflecting the respective bargaining power of the various actors in the region.

Water and military strategy in the Syrian conflict

This section discusses the dynamics of the Syrian conflict as it relates to the three remaining strategies of water weaponization laid out in table 1 and figure 1. It begins with a discussion of how all actors weaponized water as a military target through the destruction of infrastructure. I then turn to the use of water as a military tool, through flooding and supply cuts, with particular attention to ISIS. Finally, I illustrate the way in which water weaponization can act both offensively and defensively in an examination of the battle for the Tabqa dam.

Armed actors weaponize water as a military target by destroying elements of a water system, causing damage that would otherwise be beyond their military capabilities. ISIS, the Syrian government and the SDF all employed this strategy at various times. In 2013 and 2014, deadly battles between regime forces and opposition groups damaged water plants and sewage pipelines in Aleppo, Deir-Ez-Zor, Homs, Hama, Idlib and Raqqa. By July 2014, approximately 35 per cent of Syria's water treatment plants had ceased functioning; water-pumping operations stopped working in Aleppo and fell by 90 per cent in Deir-Ez-Zor.[52] Also in 2014, Syrian government air strikes targeted at ISIS' 'capital', Raqqa, destroyed the city's water plant.[53] In March 2017, the UN Human Rights Council (UNHRC) issued a report that accused the Syrian air force of 'purposely' destroying the Fijeh spring in the besieged Wadi Barada outside Damascus on 23 December 2016.[54] Although the spring constituted 'a military target' because of the 'presence of armed group fighters', the damage had a 'devastating impact on over five million civilians in both government and opposition-controlled areas deprived of regular access to potable water for over one month', which constituted a 'war crime'.[55] In destroying the water plant, the regime inflicted immense long-lasting damage on the civilian population of Raqqa and undermined the rule of ISIS long before coalition or government troops could advance into the Syrian north-east.

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[52] Strategic Foresight Group, *Water and violence*, p. v.
[53] Strategic Foresight Group, *Water and violence*, p. v.
[54] United Nations Human Rights Council (UNHRC), *Human rights abuses and international humanitarian law violations in the Syrian Arab Republic, 21 July 2016−28 February 2017*, 10 March 2017, pp. 9–10, https://t.co/p9kn1hXrwJ.
[55] UNHRC, *Human rights abuses and international humanitarian law violations*.

1358

Flooding and supply cuts: water as an offensive tool

Through the conflict armed groups have weaponized water systems as an offensive military tool. This form of weaponization differs from targeting as it allows a state or substate actor to use water assets already in their control to coerce populations, elicit concessions from opponents or provide tactical support to military action. The way actors deploy this tool can dictate how opposing sides during a civil conflict allocate resources and plan their military strategy. In 2012, Syrian regime forces used water access and distribution in the siege of Homs to gain power over populations resisting their rule; in 2014, Aleppo's pumping station was destroyed in pursuit of the same strategy.[56] On the same day that regime forces attacked the Fijeh spring, the Damascus Water Authority cut off water supplies to Damascus and its countryside on the grounds that rebel groups had contaminated the spring. Amid mutual accusations, the UNHRC investigation concluded that no contamination had taken place and that the Fijeh spring had been attacked on several occasions and destroyed by government air strikes.[57] Since the beginning of the siege of eastern Ghouta in 2013, local rebel groups also threatened to cut off water supplies to the capital to prevent attacks from the government. In July 2015, eastern Ghouta's local council executed the threat in retaliation for the state's military operations in Zabadani in another area of the Damascus countryside.[58] In the context of the Syrian war, water systems served as a force equalizer capable of temporarily shifting the balance of power contingent on an armed group's ability to pressure its opponents by withholding water resources from specific populations.

ISIS also used water as an offensive tool at the outset of the US-led coalition campaign that began in Iraq and Syria in 2014. In Iraq, ISIS flooded 22 villages and almost completely stopped the flow of water to the predominantly Shi'a cities of Karbala, Najaf, Babil and Qadisiya, leaving millions of inhabitants without access to water.[59] ISIS also displaced 40,000 people by flooding the city of Abu Ghraib and farmlands around Baghdad, and submerged 200 square kilometres of agricultural land.[60] Then, in June 2014, after conquering Mosul, ISIS briefly cut off residents' access to water and later applied the same strategy in the city of Qaraqosh.[61] On 8 August 2014, ISIS' capture of the Mosul dam on the Tigris River potentially enabled it to flood Baghdad. After 2014, ISIS intensified military operations to seize the Haditha dam, Iraq's largest dam on the Euphrates and the provider of 30 per cent of its electricity. In September 2014, in a campaign on the Syrian bank of the Euphrates, ISIS captured the Tishrin dam, then losing it to

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[56] Pacific Institute, *Water conflict chronology*.
[57] UNHRC, *Human rights abuses and international humanitarian law violations*, pp. 9–10.
[58] UNHRC, *Human rights abuses and international humanitarian law violations*, p. 9.
[59] Strategic Foresight Group, *Water and violence*, p. v; Nadia Massih, 'ISIS gains highlight "aggressive" use of water as weapon of war', *Daily Star*, 21 July 2014.
[60] Tobias Von Lossow, 'The rebirth of water as a weapon: IS in Syria and Iraq', *The International Spectator* 51: 82–99, 2016, p. 88; Peter Schwartzstein, 'Amid terror attacks, Iraq faces water crisis', *National Geographic*, 5 Nov. 2014.
[61] Strategic Foresight Group, *Water and violence*, p. v.

1359

the SDF in December 2015.[62] Following intensive bombardment by the coalition in October 2014, ISIS threatened to flood the Samarra barrage in Iraq.[63] These water conquests by ISIS prompted unilateral, regional and international military responses. In August 2014 US and Kurdish forces recaptured the Mosul dam in Iraq. In Syria, ISIS gradually lost its water infrastructure during campaigns conducted throughout 2017 and 2018, including those adjacent to major water projects on the Euphrates River.[64] As coalition forces pressed forward towards Raqqa, these campaigns would be the site of *defensive* weaponization of water by ISIS, best exemplified by events at the battle of the Tabqa dam in 2017.

Offensive and defensive strategy: the Tabqa dam

ISIS' main water resource strategy was to capture the major hydroelectric dams on the Tigris and Euphrates, and to combine military operations and the management of resources and institutions in Syria and Iraq to guarantee supply lines between the two countries. Yet water systems also served as a defensive tool, allowing ISIS to use the threat of damage to water systems under its control to slow the advance of enemy offensives. The group took exceptional measures to pre-empt any bombardment by issuing visual warnings, and framed any act to target dams under its control as a direct threat to civilian populations. No case better illustrates the tactical implications of this approach than the battle of the Tabqa dam.

The capture of the Tabqa dam, Syria's largest, in February 2013 was ISIS' most significant achievement. The dam is located 40 kilometres upstream of Raqqa— then the self-declared capital of the new 'Islamic State'. The dam provided ISIS with the capacity to release 11 million cubic metres of water in Syria and cut electricity delivery to Damascus.[65] ISIS threatened to retaliate against any attacks on its forces by destroying this highly strategic infrastructure,[66] purportedly arming the dam with six detonators to pre-empt any bombardment.[67] In January 2016, ISIS leaders allegedly took refuge in the dam, speculating that the United States would not risk a major flood by bombing the infrastructure.[68] This gamble would prove correct, and was used again by ISIS in slowing the progress of the SDF–Kurdish–American coalition's Raqqa offensive in the spring of 2017.

In March 2017, during the battle to recapture the dam, ISIS issued a warning about its imminent collapse, and blamed American air strikes for damaging the

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[62] Chase Winter, 'Syrian Kurds take strategic dam from "Islamic State"', Deutsche Welle, 26 Dec. 2015.

[63] Strategic Foresight Group, *Water and violence*, p. v.

[64] Brandon Wallace, *ISIS resurgence update: April 2019* (Washington DC: Institute for the Study of War, 19 Apr. 2019), http://www.understandingwar.org/backgrounder/isis-resurgence-update; Nouar Shamout and Glada Lahn, *The Euphrates in crisis: channels of cooperation for a threatened river* (London: Chatham House, 14 April 2015), p. 24.

[65] Shamout and Lahn, *The Euphrates in crisis*, p. 24.

[66] Shamout and Lahn, *The Euphrates in crisis*, pp. 17, 24. The Iraqi authorities, together with Kurdish Peshmerga forces, recaptured the Mosul dam on 18 Aug. 2014 (*Al Jazeera*, 19 Aug. 2014); in 2016, US-backed Peshmerga forces intensified their attacks against ISIS east of Mosul: Fazel Hawramy, 'Kurdish forces in big push against Islamic State in Iraq and Syria', *Guardian*, 29 May 2016.

[67] Personal communication with Syrian water expert on condition of anonymity, London, 11 May 2015.

[68] Damian Paletta, 'Islamic State uses Syria's biggest dam as refuge and potential weapon', *Wall Street Journal*, 16 Jan. 2016.

1360

structure and threatening to flood 90,000 residents.[69] The purpose was to incite populations against the American-led coalition, accused of causing heavy civilian casualties in the fight against ISIS in the Raqqa and Tabqa areas.[70] Russia relayed these accusations to international audiences despite official denials from the coalition as domestic sources warned about the dam's 'imminent collapse'.[71] On 28 March 2017, the PYD-led and US-supported SDF paused their military operations to allow for the inspection of the dam.

The concern aroused provided ISIS with a momentary tactical opportunity, as the pause coincided with the group's deployment of 900 additional troops to areas surrounding the dam.[72] According to SDF sources, the coalition refrained from using air strikes directly against the dam for fear of causing damage. The siege extended well into May 2017 as coalition forces cleared the dam's extensive tunnel system with small arms.[73] While the coalition eventually routed ISIS from Raqqa in October 2017, the delay proved tactically significant. The Tabqa dam was the last entry point to Raqqa after air strikes had destroyed all other local bridges along the Euphrates. This forced the coalition to commit extensive resources to its capture long after it had secured the city of Tabqa and surrounding areas.[74] At the height of the siege, most American special forces troops assigned to the Raqqa offensive were deployed around the dam.[75]

The case of the Tabqa dam evinces the importance of examining the weaponization of water in a broad historical context, with attention to how the same infrastructure can be weaponized in different ways over time. Originally constructed by the Ba'ath regime to legitimize its power in the 1960s, the waterworks were reappropriated by ISIS decades later to serve its own domination and legitimation agenda, and finally used by the same group as a defensive tool to stall a critical military offensive against its 'capital'.

Even so, to depict water weaponization over the course of the Syrian conflict exclusively in terms of adversarial events between opposing actors would be to ignore the complexity of how actors instrumentalize water systems. As the following section will show, both state and non-state actors in Syria also employed cooperation as a strategy to weaponize water to the detriment of third-party military objectives, especially as the conflict entered an ostensibly 'post-ISIS' chapter.

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[69] Editorial, 'ISIS tells Raqqa residents to evacuate over fears nearby dam will collapse', *Guardian*, 26 March 2017.
[70] Editorial, 'ISIS tells Raqqa residents to evacuate over fears nearby dam will collapse'.
[71] Zaman al-Wasl (Syrian opposition website), quoted in *Syrian Observer*, 31 March 2017.
[72] Rodi Said, 'Guns silent as engineers work to ease pressure on Syrian dam', Reuters, 28 March 2017, https://www.reuters.com/article/us-mideast-crisis-syria-raqqa/guns-silent-as-engineers-work-to-ease-pressure-on-syrian-dam-idUSKBN16Z23U.
[73] 'US-backed forces "capture" Tabqa airbase from ISIL', Al Jazeera, 27 March 2017, https://www.aljazeera.com/news/2017/03/backed-forces-capture-tabqa-air-base-isil-170327033050002.html.
[74] Fabrice Balanche, *The campaign to retake Raqqa is accelerating*, Policywatch 2760 (Washington DC: Washington Institute, 9 Feb. 2017), https://www.washingtoninstitute.org/policy-analysis/view/the-campaign-to-retake-raqqa-is-accelerating.https://www.washingtoninstitute.org/policy-analysis/view/the-campaign-to-retake-raqqa-is-accelerating.
[75] 'US to deploy 200 more troops for Raqqa offensive', Al Jazeera, 10 Dec. 2016, https://www.aljazeera.com/news/2016/12/american-troops-raqqa-offensive-161210073733228.html; Barbara Starr, Zachary Cohen and Ryan Browne, 'US join first air assault "behind enemy lines" against ISIS in Syria', CNN, 23 March 2017, https://edition.cnn.com/2017/03/22/politics/syria-tabqa-dam/.

Marwa Daoudy

Cooperation as weaponization

The territorial defeat of ISIS did not spell the end of water weaponization in the Syrian war. Instead, it ushered in a phase of the conflict where actors weaponized water through cooperation to consolidate their political power at the expense of civilians. Cooperation between armed actors over water, often at the expense of the civilian population, represents a form of coercion by which otherwise opposing sides can gain mutually beneficial concessions from one another. In March 2019, the SDF seized the last ISIS-controlled territories, which housed tens of thousands of suspected fighters, family members and civilians.[76] The Kurdish-dominated SDF then confronted the challenge of stabilizing an area representing one-third of Syria and containing 5 million inhabitants of diverse ethnic and tribal origins.[77]

In July 2019, the PYD cut off distribution of drinking water from Kurdish-populated areas under its control to transfer it to regime-controlled areas in Qamishli, revealing its de facto cooperation with the Syrian state.[78] The decision mirrored similar arrangements brokered between ISIS and the regime earlier in the conflict—between 2013 and 2017—regarding the production and delivery of hydroelectricity from the ISIS-controlled Tabqa and Tishrin dams to Damascus and Aleppo.[79] The central government continued to pay the salaries of the staff managing these infrastructures while allegedly allowing the Islamic State to retain 60 per cent of production capacity in order to ensure power delivery to regime military sites.[80] Part of the arrangement entailed the exclusion of supply lines to power stations located in rebel-held areas, thus effectively weaponizing the water agreement to advance the shared military interests of the regime and ISIS through covert cooperation, to the detriment of civilian populations in those areas.

More recently, the PYD's agreement with the government over water extended to far greater forms of collaboration. Turkey's massive military operations in north-east Syria in October 2019 disrupted the conflict's balance of power, prompting a strategic alliance between the PYD and the regime.[81] The shift also marked the emergence of Turkey as the latest 'weaponizer' of water in the conflict. Beginning in early 2020, Turkish authorities repeatedly shut off water to 460,000 people in the Hassake governorate after seizing the Al-Allouk pumping station in its offensive against the Kurds.[82] On 29 March 2020 Turkey cut off water to three refugee

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[76] Wallace, *ISIS resurgence update*.

[77] Amy Austin Holmes and Wladimir van Wilgenburg, 'Kurds and Arabs in northeast Syria: power struggle or power sharing?', *The National Interest*, 11 Aug. 2019.

[78] ARK News, 'In Qamishlo the PYD cut off water and sends it to the regime control areas', 22 July 2019, retrieved from: https://www.arknews.net/en/node/11510.

[79] 'Regime and ISIS agree to share electricity in Aleppo countryside', *Syrian Observer*, 17 March 2015, https://syrianobserver.com/EN/news/30705/regime_isis_agree_share_electricity_aleppo_countryside.html.

[80] According to Syrian opposition sources: 'In plain sight: Da'esh (ISIS) allocates quotas to the regime for Aleppo's electricity', Orient News, 14 March 2015, http://linkis.com/orient-news.net/uKXIG.

[81] 'Kurdish commander in talks with Syrian regime, Russia but "has no confidence"', *Syrian Observer*, 4 Nov. 2019, https://syrianobserver.com/EN/news/54029/kurdish-commander-in-talks-with-syrian-regime-russia-but-has-no-confidence.html.

[82] Human Rights Watch, *Turkey/Syria: weaponizing water in global pandemic?* (New York, 31 March 2020), https://www.hrw.org/news/2020/03/31/turkey-syria-weaponizing-water-global-pandemic#.

1362

camps in the middle of the COVID-19 crisis, raising new implications for the multiplicative effects of water weaponization during pandemics.

Although the territorial future of ISIS has been considerably diminished since the end of the 'caliphate', it remains clear that control of territory and key resources, including water projects, will continue to be a site of struggle as the group turns to a more guerrilla-based existence.[83] ISIS has expanded its assaults on two primary sections of SDF-controlled territory in northern Syria, including the area near Suwar along the Khabur River valley, and has continued to attack convoys and conduct operations in the Hassake governorate.[84] The new military configuration that followed Turkey's military operations inside Syria paves the way for a potential resurgence of ISIS.

Conclusion

This article has outlined a new framework within which to classify strategies of water weaponization, including both adversarial and cooperative strategies while also taking account of the historical processes that shape them. In doing so, I have provided three main contributions to existing discussions on the role of water in conflict. First, beyond war, is water used as a weapon in state–society relations? I have shown how states resort to the management of water resources and large infrastructures as weapons to project legitimacy and domination. Moreover, while agency and contingency ultimately determine how powerful actors weaponize water, these structures and systems of violent state–society water relations also dictate how non-state actors weaponize water as a tool of legitimacy *vis-à-vis* local populations. In the case of Syria, the construction of large dams and the state's land policies, dictated by ideological and strategic concerns, benefited state-supporting elites at the expense of populations in north-eastern Syria, who suffered negative impacts including the displacement of villagers in the Euphrates basin and the exclusion of Syrian Kurds from the benefits of the agrarian reforms. The north-east became heavily dependent on agriculture and reliant on a small number of key waterworks such as the Tabqa dam. In the conditions of conflict after 2011, ISIS was able to exert legitimacy and domination over the north-east through a strategy that focused on the rapid capture of dams, in turn taking over the central government's critical function of delivering basic services such as drinking water, food supplies and electricity.

Second, in my analysis of water as a military tool and target, I have built upon existing conceptions of these terms by drawing particular attention to water's dual offensive–defensive capabilities, which allow state and non-state actors alike to inflict damage beyond the capacity of conventional military tactics. Channelled as an offensive tool, water weaponization acts as a force equalizer. When actors resort to weaponization for defensive purposes, their objective is to

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[83] Alia Brahimi, 'The caliphate is over, but Isis will be back in another form', *Guardian*, 26 March 2019, https://www.theguardian.com/commentisfree/2019/mar/26/caliphate-isis-islamic-state-guerrilla.
[84] Wallace, *ISIS resurgence update*.

1363

stall the advance of enemy offensives. All actors in the Syrian conflict have used water as a military tool and targeted water systems, often resulting in effects well beyond their conventional capacities. The PYD-led SDF prioritized the recapture of major Syrian dams in their war against ISIS; ISIS used water as a weapon of war by depriving civilian populations of access to safe water in the areas under its control, and as a defensive weapon to slow and limit the operational capabilities of enemy forces.

Third, I have illustrated the need to take full account of the violent and strategically consequential nature of water cooperation between opposing actors in conflict. Do state and non-state actors engaged in mutual water weaponization also cooperate? My answer is yes. Can this cooperation itself be considered a form of weaponization, defined as a violent method used to gain advantage in conflict? My answer is again yes. State and non-state actors may cooperate over water resources while fighting each other in war to the detriment of third-party military factions, with harmful implications for civilian populations. In Syria, cooperation over water was weaponized in two key instances: first, the delivery of hydroelectricity, where cooperation took place between ISIS and the Syrian government at the direct expense of rebel forces; and second, the provision of water in regime-controlled areas, where the PYD cooperated with the Syrian regime. In the latter case, despite the apparent clash with central authorities over national aspirations and territorial integrity, this understanding paved the way for an alliance between the PYD and the Syrian government against Turkey after the latter invaded north-eastern Syria.

When studying hydropolitics, we need to acknowledge that conflict and cooperation can be two sides of the same coin. Water can be weaponized as a military tool or target, but also as a means of domination and legitimacy or a vehicle of cooperation. These strategies can all be conceived of as weapons because they involve the use of violence for strategic gain. This enhanced understanding of water weaponization has important implications for the Middle East during a critical period, while also speaking to the political analysis of resource-sharing more broadly. Most concretely, it invites further research to understand the rudiments and drivers of weaponization in cases of state–non-state interactions over other strategic resources, such as oil and diamonds, in different regions of the world. For scholars of civil conflict, this framework provides a new schema for mapping out the complexities of wartime political orders, which may include overt violent confrontation coupled with select cooperation over key resources. Rooted in a historic investigation of infrastructure policy, my study may also serve as a model in charting how the political economy of government resource extraction shapes the ability of substate actors to emerge, usurp legitimacy and exert domination. Finally, it adapts a framework that defines the mechanisms and effects of war by its impact on the most vulnerable and severely affected population groups: civilians.

For policy-makers, the challenge is how to address these various types of weaponization by a variety of actors that, ultimately, harm local populations. The systematic targeting of water infrastructure has already triggered an international civilian mobilization to draft legal principles (such as the 'Geneva princi-

ples') for the protection of large water infrastructures from state and non-state actors during and after conflicts.[85] Such efforts could pave the way for broader policy mobilization on the targeting and misuse of water resources and infrastructures by state and non-state actors, similar to the solutions successfully reached globally to counter the weaponization of other types of strategic resources, such as the Kimberley Process in the case of diamonds.[86] All in all, only approaches that consider a multiplicity of actors and resources, and mixed patterns of behaviour, can fully capture the politics of resource weaponization, and hope to generate policy solutions capable of protecting local populations and resources.

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[85] Geneva Water Hub, 'The Geneva list of principles for the protection of large infrastructures during and after armed conflicts', 13 Dec. 2018, https://www.genevawaterhub.org/fr/actualite/table-ronde-geneva-list-principles-protection-water-infrastructures-during-and-after-armed.
[86] Kimberley Process, 'What is the Kimberley process?', n.d., https://www.kimberleyprocess.com/en/what-kp.

1365

Table 1: Strategies of water weaponization before and during the Syrian conflict

Water strategy	Syrian government	ISIS	PYD
Tool of domination and legitimacy	1965–1970s, 2008: 'Arab Belt' policy in Kurdish areas of north-east Syria	After conquest of Raqqa in **January 2014**: threatened population with punishment for electricity theft and water tax evasion; used irrigation as a means of control; mimicked bureaucratic attributes of official authorities by levying taxes and imposing crop selection on farmers	N/A
Military tool	2012: during siege of Homs, cut off water access and distribution as a systematic strategy; 2014: destroyed Aleppo's pumping station; 23 December 2016: Damascus Water Authority cut off water supplies to Damascus and its countryside, including besieged eastern Ghouta, claiming fear of contamination	**March 2014**: flooded 22 villages in Iraq; **April 2014**: almost completely stopped the flow of water to four predominantly Shi'a cities; 2014: displaced 40,000 people in Abu Ghraib and its farmlands; **June 2014**: after conquering Mosul, cut off access to water here and in Qaraqosh	**July 2019**: accused of cutting off water distribution from Kurdish-populated in favour of regime-controlled areas in Qamishli, north-east Syria
Military target/goal	2013, July 2014: damaged Aleppo, Deir-Ez-Zor, Homs, Hama, Idlib and Raqqa water plants and sewage pipelines; 2014: destroyed Raqqa's water plant; 23 December 2016: destroyed Fijeh spring in besieged eastern Ghouta—'purposely', according to UN Human Rights Council's report (2017)	November 2012: captured Tishrin dam (Syria); lost in 2015; February 2013: captured Tabqa dam (Syria); lost in 2017; August 2014: captured Mosul dam (Iraq); threatened to flood Baghdad; Later, 2014: captured Haditha dam (Iraq); November 2014: attacked Qattinah lake in Homs governorate	2015: captured Tishrin dam from ISIS; 2017: captured Tabqa dam from ISIS
Tool of cooperation	2013–17, with ISIS: production and delivery to Damascus of hydroelectricity from Tabqa dam; employees' salaries continued to be paid by central government; July 2019, with PYD: cooperation over delivery of drinking water in Qamishli for areas under regime control	2013–17, with Syrian government: production and delivery to Damascus of hydroelectricity from Tabqa dam; employees' salaries continued to be paid by central government	July 2019, with Syrian government: cooperation over delivery of drinking water in Qamishli for areas under regime control

1366