

Running Dry: Syria, Mena, and **Water**

The trajectory of Syrian water governance and its deep ties with the state-building process.



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Those places had dreamed of being different from what they were. They'd had aspirations. And then the water ran out, and they fell back, realizing too late that their prosperity was borrowed, and there would be no more coming.¹

¹ From *The Water Knife* by Paolo Bacigalupi.

Abstract:

This paper explores the trajectory of Syrian water governance over the past fifty years and its deep ties with the state-building processes of a subaltern state seeking internal and external security. The case study evidences a compounding history of three phases of Syrian governance leading to contemporary water-related problems. State-building efforts focused on strengthening internal factors, such as national identity, garnered support for Syrian actions amid its relative powerlessness in the international and regional system of states. Vulnerability resulted in militarisation and defensive state formation, balancing against internal and external threats. Agrarian reforms boosted regime legitimacy in key agricultural constituencies, prioritising food security and internal stability over sustainable water management. Massive water infrastructural projects raised Syria to a modern nation at the expense of sustainable usage. Syrian state-building ultimately laid the groundwork for subsequent mismanagement of water resources in Syria.

Introduction:

The global region of the Middle East and North Africa is currently the most water-stressed in the world (Zawahri, 2019). As much as 6 percent of the global population resides here yet the region holds only 2 percent of the planet's renewable freshwater resources (Keulertz and Allan, 2019). The struggle to manage water resources already poses an intense challenge to regional states. Yet, within the next 80 years, the population is forecast to double to one billion further stressing institutionally weak and water-scarce nations (Zawahri, 2019). Concurrently in this period, regional temperatures will rise while precipitation declines (Zawahri, 2019). As demands increase on the three main river basins of the region – the Jordan, the Euphrates, and the Tigris – political tensions over water, on both the interstate and intrastate levels, will become exacerbated (Keulertz and Allan, 2019). Population growth, climate change, and the consequences of ineffective water governance are deepening a water crisis that will impact regional and domestic security for states (Zawahri, 2019). This project aims to understand trajectories of governance, both directly and indirectly related to water, to bring nuance to how state building and water management remain fundamentally intertwined (Morag, 2001). This project will therefore create space to study the implications of governance on, and related to, water. It will also reflect upon potentially sustainable avenues of water management for the region. The results of this detailed individual case study have wider applicability for other cases in the region. Furthermore, this project, by offering perspectives on domestic factors influencing policymaking as well as exploring how international pressures inform regional and domestic politics, fruitfully contributes to the literature of International Relations (Akbarzadeh, 2019).

Research questions:

- What best explains the trajectory of Syrian water governance?
- How do subaltern Realism, state-building, infrastructural power, and ideology help to explain Syrian water governance?

Case study:

The UN World Water Development Reports of 2016, 2017, and 2020 have continuously stressed the case that global water crises are founded on poor governance rather than caused by resource availability (UNESCO, 2016; UNESCO, 2017; UNESCO, 2020). Reductively, these reports deploy a narrative that supports techno-managerial solutions advocating economic and technological reasoning rather than overtly challenging the ways states use the planet's natural resources (Menga and Swyngedouw, 2018). One can see this reflected in the Israeli strategies of deploying water transport, rainwater harvesting, wastewater recycling, and desalination solutions (Tal, 2006). This case study aims to challenge the ways states utilise water. Effective water governance is crucial to the sustainable use of water resources. This case study illustrates the construction of water scarcity by the Syrian state, a phenomenon intertwined deeply with a state-building process fraught with the need to develop internal and external stability and security. This case study develops a nuanced analysis of the politics surrounding water distribution and pays critical attention to the internal politics of the Ba'th party, substantiating the multiple scales of the politics of water (Barnes, 2009).

Barnes (2009) demonstrates that water scarcity is not an inherent issue with the currently available water resources in Syria. This begs the question as to why the government has pursued policies leading to water scarcity. Indeed, it is the long outcome of the government's pursuit of food self-sufficiency, the consolidation of its rural power base and inadequate water management which have led to the misuse of water resources (Barnes,

2009). With the rise of the Ba'th party in the 1960s came the promise of food security which established legitimacy in rural areas. Therefore, the fulfilment of this promise meant agricultural and economic reforms (Daoudy, 2020; Barnes, 2009). Hafez al-Assad's regime (1970-2000) pursued agrarian reforms to maintain support in foundational rural constituencies (Daoudy, 2020). Not only was the increase in domestic food production a strategic security goal for Syria, reducing dependency on Western countries, but it was also key to the domestic political control of the Ba'th (Daoudy, 2020). These agrarian reforms sacrificed sustainable water use. Intensive and large-scale irrigation depleted groundwater resources and degraded soil quality (Daoudy, 2020). Furthermore, Ba'athist policies distorted prices of water, food, and fuel through government-funded subsidies (Barnes, 2009; Daoudy, 2020). Eventually, decollectivization and processes of liberalization began limiting the role of the state and increased privatization (Daoudy, 2020). This laid the foundation for major ideological shifts in 2005 which introduced a social market economy to attract urban businessmen and neoliberal international organizations. This led to the cutting of food and fuel subsidies which, compounded with drought, left many without water (Daoudy, 2020). Fifty years of government mismanagement and institutional failure would contribute to the rising tensions in Syria preceding the outbreak of civil war: the accumulative effect of poor water governance intensifying pre-existing pressures. This case study will look at each step of the process of Syrian state-building and resource management, highlighting critical internal dynamics which are long missing from many accounts of water management in the Middle East. Water governance in Syria is intertwined with its status as a vulnerable and permeable subaltern state struggling for domestic political order against its position in a hierarchical system of states, influencing state-building and water governance decisions with damning consequences for resource administration.

Content:

After a review of the relevant literature in chapter one, the case study of this project begins in chapter two which covers Syria in the 1960s and the 1970s. Chapter two traces the roots of water mismanagement back to the rise of the modern Syrian state. Chapter three follows, moving into the 1980s and the 1990s where shifting international power dynamics influence Syrian state development alongside the continuation of intensive water usage. Chapter four finishes the case study by situating rising tensions in Syria and the 2006-2010 drought within the context of Bashar al-Assad's social market economy, fifty years of water mismanagement, and the failure of the regime to recognise mismanagement. The project finishes with concluding remarks exploring a dynamic and exciting possibility for Middle Eastern water management.

Chapter One - Literature Review:

Introduction:

The analytical framework highlighted within this section is under-valued in understanding regional and domestic water governance and such a perspective has not been applied to Syria. A collection of perspectives is required to capture the nuanced mechanisms propelling the trajectory of water governance in Syria, especially in relation to its position in the MENA region. This chapter opens with an overview of theoretical perspectives including subaltern realism with a related conception of state security, Post-colonial International Relations theory, and modernisation theory. Underneath this theoretical umbrella, the chapter will highlight the necessary facets important to the specific context of this research. This will include the literature on state-building, infrastructural power, national identity and ideology, and water governance. Finally, this chapter will conclude with an analysis of the current problems facing Syrian water infrastructure.

Section One: Concepts and Analytical Framework

Subaltern realism:

Subaltern realism is a theoretical lens revolving around the incomplete processes of state-building – specifically in newly-created or developing states (Naz and Akhtar, 2022). The unfinished processes of state-building form a basic insecurity precursor within subaltern states – especially given their relative powerlessness, permeability, and position in the

hierarchical international system of states (Ayoob, 2019). Hinnebusch (2003) converses on the Middle East, arguing the region has been significantly shaped by the great powers of the international system. Hinnebusch notes this process is not just related to colonialism but to the penetration of Western capitalism operating through strategic transit routes, oil resources, and the creation of Israel. This impacts the internal dynamics of the state-making process and external relations with neighbouring political entities (Ayoob, 2002). For the subaltern state, internal state dynamics and transnational relations – be they between close neighbouring countries or general interactions with the international system - become intrinsically intertwined (Naz and Akhtar, 2022). This theoretical perspective favours a historical sociological approach. As such, this enables a deeper understanding of developmental processes over time with special regard to internal policy and state-building within subaltern states embedded in a hierarchical system of states (Ayoob, 2002). This nexus of the external and the internal is an excellent approach to understanding Syrian governance and, by proxy, its water governance.

Securitization:

Ayoob established a conception of security for developing states complementary to subaltern realism. Created as a perspective on securitisation, Ayoob proposes developing states suffer due to a lack of ‘stateness’, which is determined as a balance of coercive capability, infrastructural power, and unconditional legitimacy (Ayoob, 1995). Resultingly, subaltern states are unable to impose and enforce domestic political order, preventing them from participating in the international system of states – although this may well be due to hegemonic conceptions of statehood which are entrenched by the international community

(Ayoob,1995: 4). States developing within this context are acutely vulnerable to external pressures from powerful states, international organizations, and other transnational actors (Ayoob, 1995). Vivid awareness of permeability and vulnerability in developing states accordingly explains an obsession among state elites with notions of security. Consequently, issues of security relating to both internal and external factors heavily influence and shape the state-building process, shifting focus away from development in other key departments (say, water governance, for instance) towards issues of securitisation (Ayoob, 1995).

Post-colonialism:

While subaltern realism incorporates a good measure of historical factors impacting the state-building process, it is paramount to briefly investigate certain aspects of Post-colonial International Relations theory to fully enrich the theoretical framework of this project. Bearing in mind what has been analysed thus far – the development of new states within the context of the international state system – one must examine the colonial origins of the contemporary international order - such that we may fully understand its character (Seth, p.167, 2011). Postcolonialism presents an argument challenging the Western-centric ‘universality’ afforded to concepts of state-building within an international state system dominated by Western forms of knowledge and politics (Grovoqui, 2013). The epistemology upon which this concept is based is the product of an intellectual and moral presumptuousness which insinuates Western superiority (Said, 2018). States developing in this context often attempt to replicate Western-style state building and struggle for a wide range of reasons. This is indicative of the non-universal nature of Western-style frames of development and strongly suggests developing states should not be pushed to follow this path.

Modernisation:

Modernisation theory offers some fruitful supporting insights for this project. Modernisation suggests gradual differentiation and specialization of social structures results in the separation of political institutions from other structures, making democracy possible (Przeworski and Limongi, 1997). In brief, this theory attempts to develop a conceptual interpretation of processes of socio-economic and socio-political development as undergone in contemporary ‘developed’ societies, so they become applicable and deployable in developing countries (Przeworski and Limongi, 1997). Societies searching for modernity should tread the path of the West, elevating their integration into the world economy while adapting their political structure along preapproved guidelines (Leonid, 2021). This is further reinforced when one considers the epistemological background and discourses of international organizations and media; a narrative and reality which reinforces favourable assumptions about Western modernity (Ventura, 2018). Nested in the broader international milieu in which the West maintains hegemony is the justification for sanctions, aggressions, and wars, especially worrying for subaltern states aware of the pressure on them (Ventura, 2018). However, for some, the objective reality of the post-colonial era deflated the claims of modernisation as more and more states embracing the modernisation narrative fell into the entrapping of authoritarianism and state failure (Leonid, 2021).

Application:

Through a nuanced analysis of three key phases of Syrian historical and political development, this project will apply the composite analytical framework to develop a deeper conceptualisation of the trajectory of Syrian water governance.

Section Two: The Literature

Post-colonial conditions:

Utilising a state-level approach to explore the causes giving rise to post-colonial civil wars, Henderson and Singer (2000) strongly implicate domestic causation. The sources of domestic challenges and tensions leading to civil war are largely intertwined with the state-building process – a process typically recognised as difficult in post-colonial states (Henderson and Singer, 2000). When considering this in tandem with subaltern realism’s perspective on internal security, Henderson and Singer fruitfully divulge arguments suggesting elites in developing countries suffer from an insecurity dilemma. Such elites are primarily concerned with the potential for usurpation from within and are consequentially more likely to spend on the military, crowding out other expenditures (Henderson and Singer, 2000). Interestingly, Thompson (2000) takes a similar approach, arguing colonial interference has hindered welfare/state development in Syria specifically. Thompson argues that formerly colonised states have preserved the inaccessible and inadequately funded structures of an oppressive colonial welfare state. Furthermore, colonial ‘standards of civilisation’ barred membership to the international system of states for newly developing states (Delatolla, 2021). Colonial legacy shaped institutional development in new states and slowed integration into the global

system (Delatolla, 2021). This is indicative of the damaging impact of colonial venture on state-building processes – the lingering effects of colonial practice inform the developmental process.

Vitalis and Heydemman (2000) converse broadly on the extent to which state formation and the regulatory practices of much of the ‘Third World’ have been shaped by the experience of colonialism.² They make fruitful observations regarding the imposition of Allied regulations, during and after WW2, which forcefully implanted administrative and managerial norms throughout the region, suggestive of the influence of colonialism on trajectories of regional state-building. They also offer a rich insight into the colonial reorganisation of Syria’s borders, which created substates based on ethnic or religious identities, further fragmenting administration and state-building in the region and setting the stage for contemporary ethnic disputes (Vitalis and Heydemann, 2000).

Cimino (2020) ruminates on what it means to have a border and the processes behind its location and formation. As a materialisation of Western notions of sovereignty, borders can signify state power. As a state gains power and centralizes, its control and authority spread out to the peripheral – once created, a border must be maintained (Cimino, 2020). Borders can become central to the state-building process; the border plays a role in both the collective imagination of a society and as a delimitation of the ‘other’ (Cimino, p.4, 2020). Altug (2020) comments specifically on the border-building process between Syria and Turkey in a period spanning 1921-1939 – when Syria was under the French colonial mandate. For the French, the border signified the realization of colonial economic, political, and strategic interests (Altug, 2020). For the Turkish elite, the border had significant nationalistic connotations. Being both ideologically constructed and legitimized, borders become vital in national

² I leave the term ‘Third World’ in inverted commas primarily due the contested nature of the term and its damaging connotations – yet the source material cited used such language.

representation among local populations and actors and, ultimately, they must resonate among the people. They are crucial to the state-building project and, almost unsurprisingly, have been contested heavily in the Middle East (Rey, 2020). Post-colonial state-building conditions are a particularly important context to keep in mind for the case study of this project, as well as important to consider in any project dealing with a post-colonial state. The weight and turbulence of such a history is crucial for accurate analysis of developing systems of governance in post-colonial states.

State-building:

Dodge and Wasser (2014), Young (2020), and Acemoglu and Robinson (2012) dialogue broadly on state development and failure, especially in the MENA region. Dodge and Wasser suggest three main elements for state survival: control of coercion in the territory, delivery of services and development of supporting infrastructure, and the means to ideologically bind the population together with itself. They use Iraq as an example of a post-colonial subaltern state which has failed to build these elements for security. This is indicative of how colonial legacy, permeability to outside intervention, and corruption have hindered the development of the state, much as in Syria. Acemoglu and Robinson take a different comprehensive path, contending patterns of institutional development are firmly rooted in a nation's past. They especially argue this case via rich comparisons between the length of time afforded to state development in Europe against countries thrown into the deep end of the international system in the post-colonial era. They conclude differently from Dodge and Wasser: nations fail when extractive economic and political institutions stifle diversity, opportunities, and prosperity for many state subjects. Taken together, this literature suggests the historical development of a state influences contemporary systems of governance in the MENA region. However, Young

(2020) argues against the historical perspective of state development, interestingly highlighting how external aid dependency is undermining the region by fuelling corruption, interfering in domestic politics, and creating disincentives to collect taxes.

State-building and water:

Various strands of literature connect state-building to water. Allouche (2019) creates a discursive space, analysing conduits of the state-building process and a deep sense of the national appropriation of water. Morag (2001) stresses the importance of controlling and dispersing water as a central pillar to the development of the territorial, demographic, and economic bases of states. Water bodies and infrastructure became an integral part of national identity during early post-colonial politics, linked to the homogenisation of state space and to downplaying other forms of identity counter to state ideology. Using India and Israel, Allouche (2019) exemplifies the link between water politics and state-building. Briefly, the Indian discussion outlines a case of hydrologic state building where a water conflict enabled the central state to assert power over a provincial state. The Israeli case outlines an example of the forging of an ethnic nation via an aggressive strategy in a contested space where other forms of identities were being destroyed. Usefully contextualising the Syrian case study of this project, both these cases illustrate the importance of water in the state-building process and why it is crucial to recognise currents of water governance to achieve a deeper understanding of a state and its internal and external actions.

Concurrently, Barnes (2009) delves into the socio-political construction of water scarcity, arguing studies of water in the MENA region must pay attention to the internal politics operating in the state contributing to structural water scarcity. Scott (1998) takes a nuanced analysis uncovering how a state gradually gains a hold on both its subjects and its

environment, linking statecraft, coercion, and resource control to the inner workings of state-initiated social engineering. Similarly, Sowers (2020) unpacks the water-energy nexus of infrastructure, especially patterns of state development and de-development in the MENA region. Special attention is given to examining why states have long built large-scale water-energy infrastructures often in lieu of other forms of state development. States often want to appear strong and modern in ways lauded by the international system of states and this manifests itself in the over-investment in large-scale infrastructural projects. The key literature on state-building, water governance, and the MENA region is bountiful, yet lacks the nuance the analytical framework of this project will bring.

Water governance:

Trajectories of water governance are shaped by all outlined thus far – and this project will demonstrate the relevance of such conjecture through an in-depth Syrian case study. Preliminary to that, however, a closer look at specific water governance literature is required. Sneddon (2013) argues a powerful collective of interests consisting of various actors and institutions often establishes and disseminates hegemonic concepts at a global level regarding the sphere of water governance. Whether these concepts are related to markets and privatisation or the construction of scarcity and crisis, the contours of water governance are connected to the mechanisms of global hegemony – which begs the question of *whose* global hegemony. This is a key critique found in postcolonial theory and subaltern realism. Such mechanisms include international organizations which legitimize certain norms serving specific interests and co-opt the elites of dependent states. In an interesting case study, Bakker (2000) reiterates a distinct connection between the privatisation of water and fabricated water scarcity through the Yorkshire drought of 1995. Bakker draws attention to

the dangers of privatisation by conceptualizing drought as the production of scarcity. Subaltern states who are already exposed to the forceful whims of international pressure – either normatively or through imposition – may suffer greatly in the face of economic liberalization and privatisation.

An OHCHR (N.D) report links privatisation of water to factors causing breaches in the human right to water and sanitation. Heller (N.D) highlights how water and sanitation sectors in the European Central Bank, IMF, and the European Commission forced the governments of Greece and Portugal into the acceleration of privatisation programmes – as conditions for bailout loans. Demonstrative of international hegemonic concepts of water governance, international monetary institutions often play a forceful hand in privatisation processes through loan conditionality (Heller, N.D). Risks of monopoly, profit maximisation, and power imbalance rest on top of a further litany of potential facets of exploitation which can pose risks to populations – especially the already vulnerable.

Mahayni (2013) argues state development policy is integral to an understanding of water scarcity. Mahayni suggests conditions of water infrastructure, access, and usage are indicative of the lingering effects of colonial urban planning as well as residual power differences in society. Furthermore, Mahayni highlights the myriad ways water governance and irrigation in Syria have been influenced by ideological imperatives and international norms. Specifically related to this, Mahayni argues Syrian reforms central to the homogenisation of the state and the emergence of state institutions have produced conditions of a water crisis.

Gizelis and Wooden (2010) and Bohemelt et. al (2014) argue regime type influences resource distribution and the perception of resource availability. Meanwhile, Barnett and Adger (2007) and Borgomeo et. al (2021) ask whether climate change can lead to violence, finding instead that failures of water policy, ineffective administration, and lack of coercive

control place tensions on already fragile political environments. In tandem, Selby (2020) highlights how forms of state-building in Syria relating to agriculture relied on the super-exploitation of water resources. Selby contends the al-Assad regime was reluctant to acknowledge its failings and the depth of the crisis, instead embracing the climate narrative claiming the drought was beyond their power.

Water governance in the MENA:

Water and its governance are integral to national, regional, political, and food stability in the MENA (Klimes and Yaari, 2019). Regionally, countries struggle to manage the resource sustainably and efficiently, as groundwater overexploitation levels in Gaza, Yemen, Jordan, Egypt, Syria, Saudi Arabia, and the GCC states are beyond yearly replenishment levels, resulting in contamination from pollution and seawater (World Bank, 2018; Zawahri, 2019). Regional social and political instability have resulted in short-sighted water governance, potentially leading to conflict as the balance of population, food supply, and water availability are thrown out of proportion (Sandford, 2017). Scarcity challenges are left unaddressed by poor governance and distorted incentives which have, in instances including Syria, encouraged the exploitation of water consumption (World Bank, 2018; Zawahri, 2019). Farmers in many states are permitted to unsustainably tap groundwater reserves, accelerating environmental and resource degradation (Sandford, 2017). Across the region, poor governance is leading to water crises, aggravating existing fragilities which are compounding with socio-economic risks and triggering social friction (World Bank, 2018). Past and present water management choices influence future regional economic development and stability. This paper highlights mistakes of the past and explores potential options for the future; all to

understand and improve water management in the region.

Food self-sufficiency:

Food self-sufficiency as a concept generally goes undefined due to its nature as an umbrella term (Clapp, 2017). The FAO (1999) and Wegren and Elvestad (2018) broadly define it as the extent to which a state can satisfy its food needs from domestic production. As a popular idea in the 1960s and 1970s, six of the original members of the EU had self-sufficiency as a common policy goal (Wegren and Elvestad, 2018). States pursue food self-sufficiency for many reasons including national pride, reduced vulnerability to global markets, internal economic factors, or the rise of economic nationalism/ nationalist leaders in a country (Ghose, 2014). Generally, though, the key takeaway is that food self-sufficient states produce an amount equal to or greater than consumption. However, few countries can achieve full self-sufficiency without imports and concentrate instead on self-sufficiency in key crops (Baer- Nawrocka and Sadowski, 2019).

Many countries in the MENA region face a serious concern with food security (Sandford, 2017). This region has the largest food deficit in the world. If the state cannot provide food staples in the quantities and qualities required, unrest grows and food security issues easily balloon out, causing state and regional insecurity (Sandford, 2017)

In the past, regional approaches to food security have aimed for internal self-sufficiency (Woertz, 2020). These strategies have failed especially as domestic water scarcity compromised agricultural production (Woertz, 2020). This is evident in Saudi Arabia and the United Arab Emirates. Agricultural subsidies made Saudi Arabia the world's sixth-largest export of wheat in the 1990s, aided by the unsustainable mining of fossil water which

consequently ran out and production was phased out between 2008 and 2016 accordingly (Woertz, 2020). This is a repetitive story in the Middle East – as shall be highlighted in the Syrian case – and policies promoting food self-sufficiency have damaging implications for water resources.

Water Security:

Water security is having, and reliably providing, enough water of a certain quality to where and when it is needed, especially for agricultural purposes but also for the sustainable functioning of Earth's biodiverse ecosystems (Sandford, 2017). Furthermore, it means managing the water in your region without impacting other riparian access (Sandford, 2017). As the climate changes, states must manage water in greater extremes of both abundance and scarcity (Mann, 2018). Currently, MENA region water security heavily relies on water from outside the region – or 'virtual water' (Antonelli and Tamea, 2015). As the Syrian case study will illustrate, this is primarily due to weak planning and management in the water sector (Hameed et al, 2019). In fact, despite the widespread proliferation of dam systems, there is evidence suggesting dams adversely affect water security (Pradhan and Srinivasan, 2022). Sustainable resource management and social development models are founded on understanding water security. This case study brings detailed and accurate information, added nuance to understandings of the causes and determinants of water usage, including social, political, and economic aspects. Enriched understandings of such a nature are paramount to guiding new mitigation solutions (Mohan and Adarsh, 2023).

Militarisation:

Constant preparation for war and war-making change patterns of state-society interactions as well as influencing techniques of governance. Both Perthes (2000) and Heydemman (2000) situate the origins of distinctive institutional configurations and state capacities within the context of war. This is pertinent when one considers the distinct permeability of subaltern states to intrusive external forces – vulnerability to exploitation and manipulation breeds militarization. In the Middle East specifically, military threat – both regional and via intervention – has created the context under which advances in defensive state formation and accumulation of power in order to balance against threats has seriously altered state-building processes (Hinnebusch, 2003). Specifically, Perthes reflects on the transformation of Syria into a strong security state: a process that started in the 1970s. Through analysis, Perthes (2000) contends the state has deeply involved itself in society, mainly through a pervasive militarization of the state and society. Political primacy is given to national security and war preparation. Syria has used militarization as the rationale behind the development of political institutions and national identity. Security and threat – the precursors of securitization and militarization - can be understood as human constructs especially relevant to the consolidation of the state-building process (Hayes, 2013). Thinking comparatively in the region, the passing of discriminatory laws in Israel works as a process of securitizing the Palestinian minority in the state (Olesker, 2014). As such, Palestinian identities are constructed as a threat to national security, allowing the advancement of a national security policy to further cement the hegemony of Jewish identities (Olesker, 2014). Additionally, Turkey, Syria, Iran, and Iraq securitized Kurdish identities, perceiving Kurdish bids for autonomy as a threat to territorial integrity and thus adopting state-building approaches seeking to assimilate Kurdish identities into a homogeneous state with a monoethnic

dominant identity (Hama, 2020). Through the region, then, national security and militarization are important facets informing the state-building process.

Infrastructural power:

Infrastructural power is a key state-building cornerstone, especially for a subaltern state developing against a background of powerful states. Siegel (2017) argues Israel - although not a subaltern state - became a water superpower through a plethora of advances in technology, amongst other factors. Kaika (2004) emphasises the multitude of ways in which dams become symbols of modernization. This is indicative of modernity's quest to conquer and urbanize nature while reconfiguring the relationship between nature and urban spaces. For instance, dam-building projects in Iran are seen as a sign of growth yet scientists are highlighting the catastrophic impacts of such 'modernization' on Iranian water resources (Ziabari, 2022). Finally, Harris and Alatout (2010) tie together the hydro-political construction of scale as central to state and nation-building as well as territorial consolidation, much like the Israel and India cases of earlier. They highlight how scalar negotiations and constructions, socially and physically, of freshwater resources became central to the consolidation of both Turkey and Israel (Harris, 2008).

Infrastructural power can encompass several meanings. Michael Mann (1984) separates state power into two forms: despotic and infrastructural. Accordingly, he defines infrastructural power as the capacity for the state to penetrate civil society and to implement political decisions throughout its territory. Infrastructural power is the capabilities of the central state, the territorial reach of the state, and the effects of the state on society (Soifer, 2008). Mann notes the conditions for infrastructural power rely on a set of administrative,

policing, and military organizations headed and co-ordinated by an authority funded by extractions from society (Mann, 1984: 187). Many developing states attempt to expand infrastructural power to regulate, both through normative avenues and through force, a set of social and territorial ideologies and relations – while concurrently constructing boundaries against the outside (Mann, 1984). A state may promote social change by consolidating territoriality. Then, the state is centralised over a delimited territory where it can execute authoritative power. One could argue state power and infrastructural power rest upon a state's institutional, territorial, and centralised nature (Mann, 1984). This is an attractive package for any state in the development stages and many strive for territorial and infrastructural consolidation and power.

Ideology:

When the pursuit of ideology becomes tied to state-building and the development of water infrastructure, many avoidable problems arise. As the state-building literature suggests, developing a strong state usually requires a singular binding ideology between citizen and state. Haines (2010) investigates, and contests, ideas of 'development' and 'modernity' infused in the narrative of progress. They explore the powerful continuity of ideologies of 'progress' throughout the mid-twentieth century, an especially critical era as many post-colonial states joined the international system, developing under prevailing norms of progress supported by powerful states. Helfont (2015) summarises a post-colonial analysis of state formation, restating features of modernity and statehood are not rational concepts. Rather, they are drawn from social constructions developed in the West. Indeed, the Middle East regional system was modelled on the Western state system in which sovereignty goes hand in hand with the consolidation of identity and territory (Hinnebusch, 2003). However, the

imperial imposition of state borders has divided the correspondence between territory and state, leaving loyalty to the state contested (Hinnebusch, 2003). Imperial and neo-imperial powers have imposed Western ideology through the Middle East which favours certain forms of economic and political structuring which are often insensitive to the conditions of subaltern statehood. For instance, both Daoudy (2020) and Fetzek and Mazo (2014) argue the effects of the 2006-2010 drought in Syria, and the resulting conflict, were intensified because of regime economic and political ideology guiding state-building process. Concurrently, these approaches exerted different pressures over the diverse population, highlighting a contrast between the political power of the Alawite elite and the impoverished rural Sunni majority. Processes of state-building and water governance become enmeshed in national identity and ideology.

Expanding on the regional dynamics of identity and ideological formation, Hinnebusch (1994) examines the Arab state system through various historical points, noting the powerful influence of Arabism on the consolidation of statehood in the region. He notes the continuity of Arabism as a blockade stopping individual states developing the legitimacy which builds in correspondence with a united and distinct nationhood (Hinnebusch, 1994). Around the time many states in the region achieved independence, ideas of pan-Arabism – which is the total commitment to Arab unity – were circulating as states struggled between pan-Arabism on one side and the development of a singular and new state identity on the other (Zissler, 2022). Coherence within a national identity is critical to state strength and as such, much of the region of the Arab world has remained susceptible to external influence (Hinnebusch, 1994). It is also worth noting the impact of colonial ethnic divisions in the region which further exacerbated the deterioration of internal relations and halted any potential future unity (Silva and Ferabolli, 2021).

Current state of Syrian water infrastructure:

It is crucial to highlight the current state of Syrian water infrastructure in relation to the outbreak and perpetuation of the 2011 Syrian civil war. Many notable causes catalysed the ignition of the war, working in collusion with the brutal corruption and political repression of the long-lasting Assad regime(s) (Fetzek and Mazo, 2014:144). Continuing for over a decade, the civil war has been one of the most impactful crises of the 21st century. The UN estimated approximately 14.6 million people in need of humanitarian assistance in 2022 (UN News, 2023). Syrian water governance and its lack of institutional capacity to manage water resources amplified the effects of an ongoing drought. Many critics suggest drought and water mismanagement in Syria had a magnifying effect on the socio-economic and socio-political causes of the Syrian civil war (Fetzek and Mazo, 2014; Daoudy, 2020; Selby, 2020). It is also pertinent to emphasise that descent into civil war in Syria illuminated regional rivalries, international interference, and the permeability of Syrian state borders by regional powers as well as Russia – all illustrative of this paper’s perspective on subaltern state building (Abboud, 2018).

Throughout a decade of civil war, violence has synonymously decimated regional populations, institutions, and infrastructure critical for the maintenance of society (Gleick, 2019). This includes systems integral to the collection, treatment, and distribution of safe drinking water (Gleick, 2019).

Syrian water governance pre-civil war had profound amplifying implications for the political and economic roots of the outbreak of war. Concurrently, the current dire conditions of Syrian water infrastructure create academic space for a nuanced examination of the historical phases of Syrian water governance leading to the war. Furthermore, this creates a space for learning and a space for recommendations moving forward into the rehabilitation of

the Syrian state – especially considering the Assad regimes recent re-acceptance into the Arab league (The Guardian, 2023).

Methodology:

This project consists of a detailed single case study of Syria – a format useful for testing theoretical understandings (Bennett, 2004). This will include the political, economic, and historical development leading to Syrian water governance in the contemporary era. The wider context of the MENA region is explored in the literature review to demonstrate the systems in which Syria is enmeshed, both physically and politically. The project is based on research from primary and secondary sources with no new data gathered. The project structure will follow an application of the analytical framework to three distinct phases of Syrian governance.

The usefulness of case study research is found in its contextualisation of social and political phenomena in real-life events (Barrington et al, 2014). Case studies have become standardized with rigorous structures and forms in place to ensure both consistency and accuracy (Bennett and Elman, 2007). The advantages of such a case study include the examination of causal mechanisms within specific contexts, a historical approach to cases, and the enfoldment of deeply complex relations into otherwise typological theories. However, case studies are prone to selection bias whereby cases are selected proving a theoretical assumption while ignoring ones that do not readily support such assumptions (Achien and Snidal, 1989). A further criticism suggests case studies lack wider representation (Bennett, 2004).

This project follows process tracing research methods which incorporate explicit attention to, and detail supporting, the explanation of the proposed hypothesis. In other word,

sustained focus on the processes through which the outcome arose via detailed empirical research on the hypothesized processes (Bennett, 2004). The historical nature of this case study will allow the application of the theoretical concepts to each historical step, showing how each subsequent step is constructed by the variables of the step before to reach to ultimate outcome - the conditions which produced the initial context for the hypothesis (Roberts, 1996). Process tracing and its historical explanations will provide a complete chain of evidence for the *milieu et moment* (Bennett, 2004).

Many states in the MENA region share an extremely close developmental history. For example, Syria, Iraq, and Palestinian territories (Hinnebusch, 2003). The framework and methodological approach of this single case study can be transferred across to other states in the region, fruitfully producing other detailed studies complimentary to this one. This will enrich the content of this project, opening room for larger comparative studies in the future.

Case Study: Syria

Chapter two - The 1960s and the 1970s:

Introduction:

This chapter covers a period in Syrian state-building ranging from 1960 to 1979. It opens with the rise of the modern Syrian state, following the ascension of Hafiz al-Assad to power. Syrian state-building under Assad saw a Syrian national identity forged and an expansionist policy agenda all increasing Syria's rising global position. The following section explores war-making and defensive securitization and how these processes informed Syria state building. The discussion then moves to explore agrarian reforms in Syria and the importance of these reforms for the consolidation of a rural power base critical to the regime. These reforms enabled the pursuit of food self-sufficiency yet also set the foundations for fifty years of water mismanagement. Finally, the Euphrates Dam project is situated within the contexts of infrastructural power, development, state-building, and water governance.

Rise of the modern Syrian State:

Through the 1960s and the 1970s, the Syrian Ba'ath party pursued a radical political agenda reflective of a deep devotion to social transformation (Abboud, 2018; Hinnebusch, 2015). Crucially, the party would experience a "corrective revolution" reining in some of the party's radical positions, beginning to consolidate the state-building process, and positioning Hafiz al-Assad as the head of the Syrian state (Abboud, 2018; BBC news, 2011). This involved the propagation of Syrian sovereignty and a regionalist vision which would ultimately shape the structure of the Syrian state – with consequential changes for foreign policy as well as for

Syria's border and territory (Klaz and Abdennabi, 2020). While Assad was consolidating power, the regime remained efficient at oppressing and restraining opposition – both domestically and from external threat (Abboud, 2018). The cost of maintaining a heavy hand on the state reins was high – democratization was dispensed of, and a Syrian state was born resting on the foundations of authoritarian control; namely the army, security apparatus, corporate actors, and the public sector (Abboud, 2018).

Throughout the 1960s, the Ba'th party, and Syrian politics were fraught with ideological incoherencies which defined seven years of factionalism. The 1970 corrective revolution finally put Hafiz al-Assad into the driving seat of the state and consolidated the party through ideological revisions, pulling the cross-sectarian, civilian-military composition of the factionalized party into a whole while also maintaining a commitment to socialism and the liberation of Syrian territories occupied by Israel in 1967 (Abboud, 2018; Zissler, 2022).

It is well worth noting that it was during the corrective revolution the Alawis, an ethnoreligious group, began to dominate positions of power in the regime; both in the government and the army (Silva and Feraboli, 2021). This is evident in the Latakia region – predominately Alawi – which saw a 60% increase in access to safe drinking water from 1970 to 1985 (Silva and Feraboli, 2021). This came because of disproportionate socio-economic development favouring the region which also saw investment in education increase the number of students by 124% in 1977 compared to 1964 (Silva and Feraboli, 2021).

Assad achieved Syrian sovereignty and consolidated his power mostly through the expansion of the army and intelligence services. These were reorganised throughout the 1970s and given more resources to pursue regime opposition and to protect new leaders while serving a policy-promoted regionalist expansionism (Klaz and Abdennabi, 2020; Perthes, 2000). Assad further consolidated his power through the strengthening of other state institutions, including education, health, welfare, and communications (Zissler, 2022). This

included the expansion of popular and professional organizations such as trade unions – these were reorganized into hierarchical, corporatist bodies that would represent and, perhaps more crucially, contain segments of the population (Perthes, 2000).

Assad's reformations worked on both the domestic and the regional level; mostly to reorganize against antagonistic social forces (Abboud, 2018). Over 1972 and 1973, a National Progressive Front was created, enfolding all Syrian parties under the political helm of the Ba'ath (Klaz and Adennabi, 2020). A new constitution made the State the guarantor of Syrian sovereignty (Klaz and Adennabi, 2020). In this way, sovereignism 'Syrianised' Ba'ath and State institutions. Much can be gained from the creation of and inculcation of a state identity or national identity – a centralized state may develop commitment from its inhabitants through the propagation of such identities (Zissler, 2022). Fukuyama (2018) argues national identity is pivotal to the success of modern states. During this period, two main factions dominated ideas of identity in the state. Pan-Arabism advocated for a total commitment to Arab unity while pan-Syrianism supported a total commitment to a distinct Syrian identity and to the idea of the Syrian state (Zissler, 2022). Assad consolidated the two into a stable foundation for a Syrian national identity, blending territorial Syrianism, Arab national conceptions, and Islam, developing a national commitment to the state (Zissler, 2022).

At an international and regional level, the development of sovereignism in Syria was supported through the expansionist policies of the 1970s seeking to counter the similar agendas of bordering countries such as Israel, Turkey, and Iraq (Klaz and Abdennabi, 2020). The imposition, or development, of a national or state identity by Assad during this period became an integral pillar supporting Syrian interests in the region, preventing, and reducing, both regional and external influences in internal affairs (Wakim, 2013). Furthermore, identity-building and nation-building were valorised in the borderlands of the Syrian state, as

peripheral regions came together with the State through the consolidation of territory and borders (Can, 2020). This is exemplified via the continuously challenged annexation of Antakya by Turkey in 1939, indicative of an aggressive regional territorial mission, highlighting the argument of subaltern realism and state insecurity (Can, 2020). Moreover, Syrian sovereigntism did not limit itself to indirect contestations, allowing justification of clear military intervention (Klaz and Abdennabi, 2020). The intrusion of Syrian intelligence forces in Lebanon was justified as actions taken to protect the external security of Syria. During this period, external security begins to take centre stage in Syrian foreign and domestic policy, indicative of the extent to which Syria transformed from a subordinate and marginalised state to a predatory state in the Middle East. Syria becomes a globally recognised regional power (Klaz and Abdennabi, 2020; Zissler, 2022; Wakim, 2013; Axon and Hewitt, 2018). Interestingly, acknowledgment of this esteem is revealed in President Carter's May 1977 visit to Geneva to meet Assad – a gesture no other regional leader received (Axon and Hewitt, 2018).

Assad's actions during this period strongly correlated with subaltern realism's perspective on developing states. The development of strong internal dynamics in Syria generated support for Syrian actions in the region undertaken to ensure Syrian security. The internal state dynamics are intertwined with the external as the development of domestic political order strengthens the state-building process against an awareness of the relative powerlessness of Syria in the period – including its permeability to external influences and position in the hierarchical system of states. It is evident Syrian state-building, and the development of a national identity, was done in response to and in awareness of Syria's vulnerability in regional and international relations.

War making and defensive securitisation:

This period of Syrian state-building was fraught with regional instability and insecurity. With Hafiz al-Assad's rise to power, Syria had been reshaped into a relatively strong security state (Perthes, 2000: 149). Regionally, Israel acts antagonistically, meaning Egypt and Syria consist of two military powers on the front line – when they act together, they have both leverage and security (Hinnebusch, 1994). Throughout modern Syrian history, the state has played a key role in the confrontation with Israel and the opposition to American regional domination (Sottimano, 2015; Ma'oz, 1999). As such, war - and preparation for war - has had a pivotal influence on the Syria state-building processes. The 1973 war with Israel and a narrative cultivated in Syria in which the state stood as the embodiment of Arabism holding strong against Western-influenced forces strengthened the state-building operation of Syrian policymakers (Sottimano, 2015). This narrative conveniently muddled the line between a party, a state, and a regime; all of which was clearly locked in a struggle against Israel. Therefore, the regime was able to deflect criticism by suggesting it was undermining the state, its mission, and the very foundations of the nation (Sottimano, 2015).

After the 1973 war an 'Arab triangle' emerged in which Egypt and Syria presented a somewhat united front against Israeli territorialisation (Sottimano, 2015). However, in 1978 Egypt changed the milieu of the situation. By removing itself from the Arab-Israeli conflict, signing a peace treaty with Israel, heavily favouring Israel, the Syrian eastern front was left vulnerable to threats (Wakim, 2013). Situationally speaking, and in awareness of Israeli military superiority, Syria felt insecure. Assad was prompted to balance strategically against Israeli, strengthening the Syrian army with advanced equipment and personnel (Wakim, 2013; Hinnebusch, 1994).

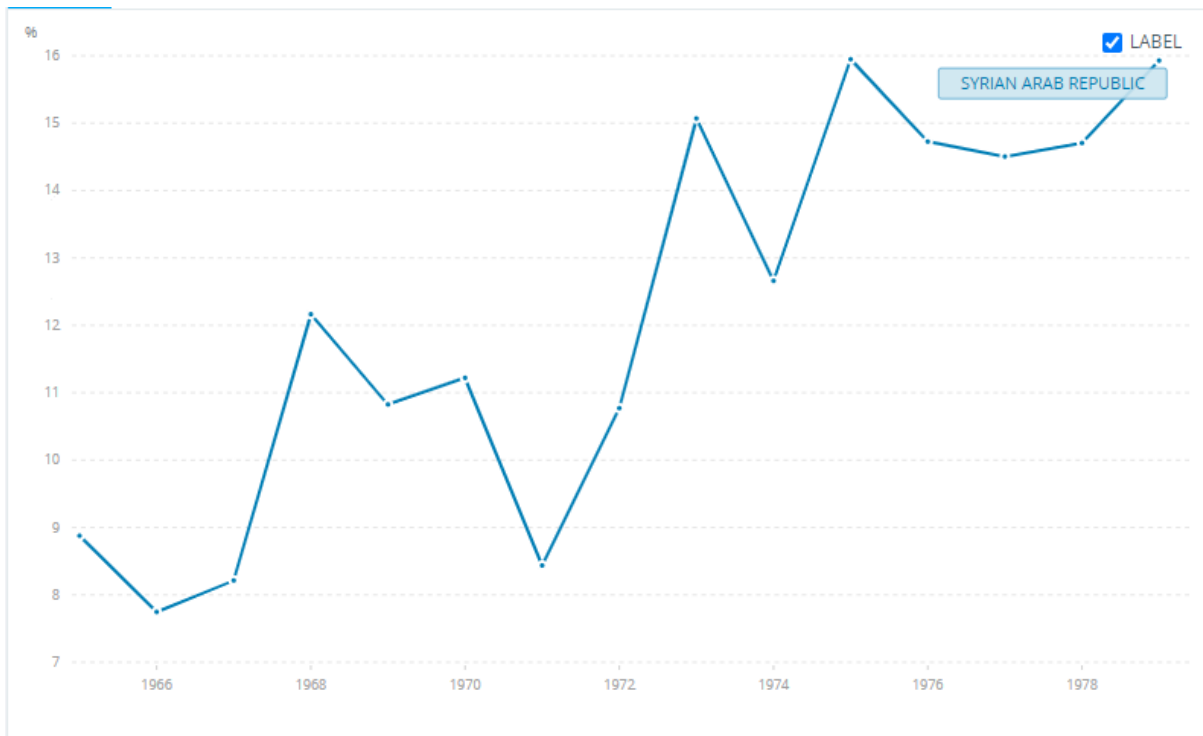


Figure 1: Syrian Military expenditure as a percentage of GDP 1966-1979. Source: data from World Bank. N.D

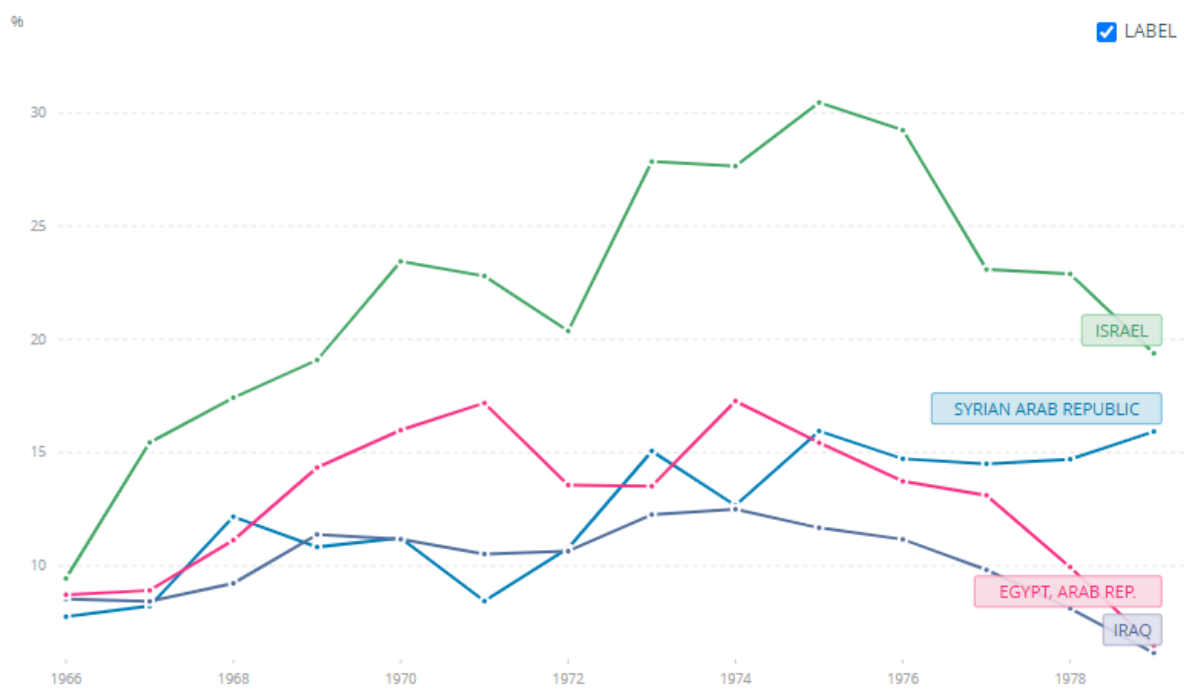


Figure 2: Military Expenditure of Israel, Syria, Egypt, and Iraq as a percentage of GDP 1966-1979. Source: data from World Bank N.D

As is evident, incentives for state-building against high external military threat in the region were prevalent. The Syrian state had a preoccupation with an accumulation of power necessary to balance against threats (Hinnebusch, 2003: 80). As such, war propelled the development of Syrian and Iraqi forces to a radical level of military mobilization – increasing to as much as 62.4/1000 of the population in 1987 (Hinnebusch, 2003). Part of the very legitimacy upon which the Ba’th regime relied was in its defiance of Israel and external Western influence – violent confrontation over Palestine and the Golan Heights has legitimised the construction of a national security state (Hinnebusch and Zintl, 2015; Droz-Vincent, 2019; Hinnebusch, 2001).

Further compounding regional insecurity was Syria’s relatively recent entry into the international system of states, entering at the bottom of the hierarchy and on the margins of the capitalist world system, leading to a defensive modernization strategy (Hinnebusch, 2001). Assad forged the Ba’thist state as a weapon capable of challenging Israel and, therefore, state formation, in some regards, arose out of the external threats of Israel (Hinnebusch, 2001). In fact, widely dispersed and accepted political narratives surrounding the armament policies of Damascus stressed Syria was the only regional power able to balance with Israel; a discourse suggesting Syrian military capabilities were defensive against Israeli aggression and powerful enough to force concessions (Perthes, 2000). In the Syrian case, war, and the necessities of war, have not only justified authoritarianism and reduced personal freedoms but have also promoted the development of Syrian political institutions (Perthes, 2000). Furthermore, militarization and securitization have propelled a sense of Syrian national identity – an identity built against regional insecurity and international vulnerability (Perthes, 2000). Hinnebusch (2001) presents an alternative view suggesting domestic instability is a more likely factor behind pervasive militarization. This is due to the internal dynamics of developing states in which a presiding regime may lack legitimacy,

institutional power, and a secure identity – leaving the door open for rebellion (Hinnebusch, 2001).

To build stability both domestically and regionally, the Syrian state deeply involved itself in public social life as notions of securitization and militarization were explicitly advanced to develop politically and consolidate a strong national identity. This is in line with the perspective of subaltern realism which highlights the distinct permeability of subaltern states to intrusive external forces. This vulnerability to exploitation and manipulation breeds militarization which in turn spurs advances in defensive state formation and the accumulation of power to balance against threats both externally and internally. This profoundly alters the state-building processes of states such as Syria, which prioritise security over all else.

Agrarian Reform: The promise of the Ba'th:

The Syrian Ba'th party claimed its legitimacy through widespread rural support. This is an important political dynamic animating water use in Syria. The regime began in poor rural areas, intent on tackling the landed oligarchy and an exploitative urban merchant class (Hinnebusch and Zintl, 2015). The Ba'th party was initially unsupported in cities with early followers drawn from a peasant youth in a deprived countryside; plenty of evidence suggests political mobilization is not possible without incorporating a peasant class into a political system (Hinnebusch, 2001; Hinnebusch, 1982; Brockett, 1991). As such, of 24 members of the Regional Command of the Ba'th party between 1966-70, only 8% came from cities while 87% were from rural towns or villages (Barnes, 2009). Central to the narrative of Ba'th legitimacy was Hafez al-Assad's peasant roots, which were utilized to support an agrarian modernist image accompanying the party's modernizing developments intended to empower the peasantry (Daoudy, 2020). As such, local organizations became broadcasters of regime

ideology, using reform and development operations to generate massive rural support (Daoudy, 2020). Not only was the countryside and its natural resources foundational to the socioeconomic development of the Syrian state, the rural areas also provided a political pillar the Ba'th simply could not lose (Daoudy, 2020; Barnes, 2009)

Consolidation of a rural power base is a key influence on the trajectory of the Syrian government's agricultural policies and subsequently how the country's water resources have been developed and distributed (Barnes, 2009). A long tradition of centralized development planning and agricultural modernization has permeated the Ba'th party since the 1960s, yet agrarian reform was not singularly aimed at consolidating a political power base (Mahayni, 2013; Keilany, 1980). Land reform was needed to create a surplus necessary to propel industrialization (Hinnebusch, 2001). This was also viewed as the pathway to industrialisation under modernisation theory: Syria trying to emulate the British Glorious Revolution of 1688 which limited the power of executives and gave the parliament determinacy over economic institutions, paving the way for the Industrial Revolution (Acemoglu and Robinson, 2012). This economic surplus would eliminate exploitative labour under private ownership and break economic dependency with Western investors (Hinnebusch, 2001). The state achieved this, establishing state farms and cooperatives which would break the power of the landed oligarchy. The state could favourably control an agricultural market in which the implementation of a pricing policy meant Syrian-produced materials and food - critical to the goals of the state - would be purchased above global market prices by the state (Hinnebusch, 2001). The Syrian state wanted to achieve food self-sufficiency, indicative of a political motive beyond the consolidation of a power base (Barnes, 2009; Juusola, 2010). The Syrian state was motivated by a supposed goal of the West to use food as a weapon to counter the economic strength of Arab oil (Hinnebusch, 2001). Self-sufficiency permeated discussions of agricultural development as the government tailored

crop rotations regionally, seeking to increase agricultural productivity through expansive irrigation, and promoted the production of key crops important to both self-sufficiency and export earnings – particularly wheat and cotton (Hinnebusch, 2001; Barnes, 2009; Daoudy, 2020; World Bank, 2001). Cotton is prolifically recorded as water-intensive crop (see Okafor, 2021; IDH, N.D; WorldWildLife, N.D). Meanwhile, yields of wheat increase dramatically with irrigation whilst being an already water-intensive crop. (See Zaveri and Lobell, 2019; Wiberg and Zehnder et al, 2007; Reynolds and Pietragalla et al, 2008; Wang and Elliot et al, 2021).

The ‘strategic’ crops of cotton and wheat were not simply for internal self-sufficiency but also for export earnings (Hinnebusch, 2001). Wheat is predominately Syria’s main crop and its intensive irrigation and farming help consolidated gains and profits for vested interests in Syria who saturated the market as Syria became a net exporter of wheat (Daoudy, 2020).



Figure 3: An irrigation channel near Karkur. Source: de Miranda, 2023

Furthermore, land reform can function as a method to establish a political link between a revolutionary elite and the masses (Keilany, 1980). As a form of national integration, agrarian reforms act as a territorial expansion of central authority to the

peripheral, developing a psychological identification in the population with the state (Keilany, 1980). Land redistribution and reform are key to developing a strong state and expanding the possibilities of sustained economic growth and are therefore attractive for a developing subaltern state (UN, 1966).

Agricultural reform in this period exposes the ways in which Syria's status as a subaltern state has influenced and created the context for water scarcity. Its policies encouraging the production of key crops have functioned as a mechanism to ensure food security while also ensuring internal stability via the support of key agricultural constituencies (World Bank, 2001). These levels of self-sufficiency in food and the support of cotton have sacrificed sustainable water practices (World Bank, 2001; Daoudy, 2020). To create internal stability as well as build against external influences via food self-sufficiency, this period of Ba'thist Syria marks the beginning of a trajectory of governance which ultimately leads to the production of scarcity of water as a valuable resource.

The Euphrates Dam Project:

When the Ba'th rose to power in 1963, there were no dams in Syria (Cotillon, 1993). Big projects like dams function as a means and a result of the state-building process, reinforcing the state's capacity to control resources and human capital (Fantini et al, 2018). One can see dam building as a part of the processes of state territorialization whereby political authority is reproduced through the transfiguration of the landscape, the concentration of resources, and the execution of state power over territory (Fantini, et al, 2018; Menga and Swyngedouw, 2018). The appropriation of water resources and infrastructure assigns power to those in control. Therefore, dams and other hydraulic structures can be used to enforce the hegemonic strategies of state-building (Menga and Swyngedouw, 2018). Furthermore, modernisation and

certain notions of progress relating to the nation-state are frequently measured against standards of technological innovation (Menga and Swyngedouw, 2018). The Ba'ath Third Five Year Plan (1971-1975) saw massive investment in large-scale infrastructure (Barnes, 2009). Funds allocated to agricultural development by the state increased from 136 million Syrian pounds to 890 million under the plan (The New York Times, 1976). The construction of the Euphrates Dam acted as a display of Syria's modernization and highlighted its agrarian socialist project (Lange, 2019; Hinnebusch, 2001). As a physically symbolic manifestation of the Assad regime's progressive discourses of national heterogeneity, this infrastructural project promoted at its core an image of a progressive, modern, and homogenized Syrian state (Lange, 2019). This is especially pertinent considering the opinion on the international stage from the 1930s to the 1970s regarding the construction of large dams as synonymous with development and economic progress (American University International Law Review, 2001). The projects' claims of progress and development included irrigation canals, pumping water for drinking, and the construction of state farms (Lange, 2019). Many of these promises were belied. After ten years, the total irrigated area did not equal the cultivated areas submerged when the dam closed (Lange, 2019). Investment in irrigation and dam building did not relieve the agricultural sector of its dependence on rainfall partly because the benefits of irrigation were muted by growing salinity in the soil (Hinnebusch, 2001). It is worth noting dam building, and in particular, this project did at least provide electrical generation for the benefit of the population (Barnes, 2009; Hinnebusch, 2001).



Figure 4: Euphrates Dam. Source: Aljazeera, 2021

The Euphrates Dam project was, for Syria, the embodiment of a state mission to showcase itself as a successful and strong modern state in total control of its territory and its resources. What is shown through infrastructural development is Syria's attempts to emulate modernization and state-building in a fashion similar to powerful consolidated states in the West. Water bodies and related infrastructure are linked to the homogenization of state territory and state ideology; a method for the Syrian state to penetrate territory, regulating both spatial and social relations and ideologies. Projects expanding Syrian irrigation networks evidence the government's commitment to agrarian reforms necessary to consolidate power domestically. In the Syrian case, attempts to emulate notions of progress and modernization while appeasing a political power base came at the cost of sustainable and safe water management.

Chapter three - The 1980s and the 1990s:

Introduction:

To understand the background of water management in Syria, the regional contexts in the years leading to the civil war must be examined (Daoudy, 2020). Shifting international power balances changed the way states in the Middle East engaged with, and responded to, the global system of states. Crucially during this period, processes leading to economic liberalization would impact the very trajectory of water governance in Syria which, in turn, would have its own consequences for rising tensions in Syria post-2000. According to the IMF, the economies of countries in the Middle East region experienced a period of vigorous economic development in the late 1970s and early into the 1980s, which evidently led to the development strategies and the expansion of water infrastructure as seen in the previous chapter (Havrylyshyn, 1997). Syria itself rose to a middle-income country as the percentage of the labour force with secondary and university education increased by 13% over 19 years from 1970 (Hinnebusch, 2001). However, the late eighties saw regional economic stagnation (Havrylyshyn, 1997). Relevant to the Syrian case is the growing support of oil revenues in the 1960s and 1970s which propelled Syrian state-building as well as its capacity to develop water infrastructures. This did not last and highlighted fundamental problems in the structure of the Syrian socialist economic plan (Alajaty and Anchor, 2018; Perthes, 1992; Abboud, 2015).

The 1970s mission to achieve economic independence via import substitution industrialisation backfired, as the regimes reliance on a powerbase supported by such industrialisation created a balance of payment issues (Hinnebusch, 1997). The economic crisis of the 1980s resulted directly from the development strategies and policies of the 1970s

in which Syria, as a subaltern state, sacrificed strong economic development in favour of political inclusion, stability, and state dependence (Perthes, 1992; Abboud, 2015). Although these strategies sought growth and modernisation – in part to build a strong state against other regional players – these goals were achieved by external aid and the resulting economic crisis in Syria is illustrative of Young’s arguments regarding the pitfalls of aid dependency. External aid meant public sector accumulation, taxation, and other domestic forms of capital accumulation only covered about two-thirds of expenditures pertaining to government, defence, and development in the eighties (Hinnebusch, 2001). Compounding on top of regional and domestic economic issues, this period witnesses a massive alteration in power dynamics as the USSR fails and the Gulf War shifted allegiances which ultimately shaped Syria as a vulnerable state, leading to an economic liberalization that had damaging consequences for both water management, and the government generally, in the post-2000 era.

Decline in oil rents:

Syria heavily benefited from Arab oil-funded support due to its position as a frontline state in the Arab-Israeli conflict (Hinnebusch, 2015). This is especially the case in the late 1970s and early 1980s, a decade experiencing record high oil prices (Perthes, 1992; Hinnebusch, 2015; Shojai and Katz, 1992). One estimate argues up to 60% of Syria’s budgetary resources came from foreign loans during this period, empowering Syria to offset about half of its trade deficit (Gongora, 1997; Perthes, 1992). Furthermore, although Syrian oil production less than tripled between 1970 and 1975, the value increased from 130 million Syrian pounds to 2.4 billion over the same period (Perthes, 1992). Oil was Syria’s main export, contributing to 79

percent of the value of exports in 1980 alone (Perthes, 1992). The crutch of oil-fuelled aid constructed a façade hiding the problems of Syria's socialist economy and acted as a barrier to Syria creating sustainable growth rates (Alajaty and Anchor, 2018; Hinnebusch, 1997; Hinnebusch, 2015). In the 1980s, when oil prices fell, financial support from the Arab Gulf declined and the Syrian regime was unable to invest in the state and its ability to fund its various state-building projects became limited (Alajaty and Anchor, 2018). Oil prices fell from \$34 to \$29 per barrel in March 1983 and continued to fall to \$9.64 per barrel by July 1986 because of huge Saudi Arabian surpluses on the market (Shojaz and Katz, 1992). This marked a period of regional and global economic instability (Shojaz and Kat, 1992).

While oil income and Syrian foreign policy financed the state, there was little incentive to develop taxation structures, nor to decide between defence and state development (Gongora, 1997). As such, when global oil prices fell, the weakness of such reliance and the weakness of Syria's import substitution was revealed (Hinnebusch, 1997). The plan to increase Syria's exports relied heavily on oil production and stable oil prices while growing foreign exchange problems compounded with material shortages in both agriculture and industry, leading productive parts of the economy to stagnation and regression (Perthes, 1997). This essentially contributed to an economic crisis in Syria, indicative of Young's argument that aid dependency undermines the region by interfering with domestic politics and creating disincentives to collect tax.

Fall of the USSR and continued military build-up:

The Syrian state was pursuing an ambitious policy of strategic parity with Israel, attempting to assert itself against its position as a vulnerable subaltern state (Gongora, 1997; Sadowski, 1985). This continued well into the 1980s when the state had to start considering the trade-off

between state-led development and military parity (Gongora, 1997). Consider this: in 1984 defence spending was 33% of the total budget – an absolute drain on the economy (Sadowski, 1985). In its attempts to secure its regional and international position, Syria was undoing itself. Military expansion relied on the economy, oil funds, foreign subsidies, and the Soviet Union – all of which were in decline (Gongora, 1997; Hinnebusch, 2015; Hinnebusch, 2001). This threatened the very legitimacy of a regime that was committed to ideologies of national security and mass military mobilization (Gongora, 1997).

To try and resolve imminent political dissatisfaction, the eighth regional congress of the Ba’th party recommunicated the regime’s allegiance to military parity while reinforcing commitments to economic development encouraging private investment and the forces of the market (Lawson, 1990). Further policies of economic liberalization were adopted after the Congress as the development budget was also reduced (Lawson, 1990; Gongora, 1997). Moreover, to embrace military expansion, the congress projected a continuation of austerity measures in place since 1980, reducing commodity subsidies and development investments which may have otherwise gone elsewhere (Sadowski, 1985; Hinnebusch, 1997). The Syrian state was struggling to maintain a balance of coercive capabilities, infrastructural power, and the legitimacy it needed as a subaltern state for participation in the system of states. What is interesting to question is whether the Syrian state really needed to continue its relentless pursuit of regional security and one has to wonder whether the region would have benefited from the withdrawal of external influence, especially if one considers US support of Israel as an antagonist and a force against peaceful regional development (For evidence of US support of Israel, see Arnon, 2017; Roth, 2009; Allin and Simon, 2003; Warren, 2003). And one must not forget Soviet support and interference in the region too (For Soviet support of Syria see Karsh, 1998, Sullivan, 2018). As it is clear militarisation – and Cold War proxy dynamics - in the region have altered state-building processes, one also must wonder where regional water

resource management might have ended up without such interference.

Resulting in the retreat of the Soviet Union from the international stage, radical Middle East states in their favour were unable to count on Soviet economic, military, and political support (Wakim, 2013). The disappearance of this power altered the crucible in which Syria had attempted to forge itself, radically changing regional conditions and further exposing Syrian vulnerability and permeability (Hinnebusch, 1997). Assad was – probably rightly – convinced Syrian foreign policy in opposition to the remaining US superpower was no longer sustainable (Hinnebusch, 1997; Wakim, 2013). As such, Syrian policy began a shift to impress the American suitors; namely measures of internal liberalization. Transformations in the global system during this period forced the subaltern states of the region to restructure their relationship with the international system of states in response to a new balance of power which threw them into insecurity and uncertainty (Niblock, 1994).

The 1990-1 Gulf War:

The Gulf War of 1990-1 grew out of a ‘centreless’ Arab system of the eighties. Oil permitted state apparatus consolidation but it also linked the interests of Gulf states to those of the West and divided them from the Arab world (Hinnebusch, 1994). During the Gulf crisis, states external to the Middle East radically changed their relations within the region (Niblock, 1994). Syria and Iran found themselves favoured in Western coalitions while Saudi Arabia hosted a large foreign armed force on its soil (Niblock, 1994). Soviet withdrawal exposed Syria, removing its war option, and making anti-Israeli posturing dangerous (Niblock, 1994; Hinnebusch, 1994; Murphy, 1994). Meanwhile, the disintegration of the USSR left the US free to pursue its ideas in Arab-Israeli matters. The Gulf War highlighted fundamental

changes in the international order, revealing an insecurity for Syria to adapt against, aiming to be accepted by the US as a player crucial for peace in the Middle East (Hinnebusch, 1994; Niblock, 1994). The war demonstrated the US was ready to use force and economic sanctions against any deemed a pariah state, prompting Syria to play by Western rules to remain secure and unpenetrated by external forces (Murphy, 1994).

Further expansion of irrigation:

It is well worth noting several key continuations and developments in the irrigation sector over this period. The state, to its detriment, continued to plough money into the Tabqa Dam scheme, seeking to achieve rapid growth and structural modernization at the expense of economic stability and, of course, sustainable water management (Sadowski, 1985; Perthes, 1995). Furthermore, official narratives of the 1980s and 1990s continued to stress food security as a matter of national stability and self-reliance (Daoudy, 2020).

By the end of the nineties, agriculture accounted for just about 90% of all the water drawn from Syrian water resources – aquifers, rivers, and lakes (Aw-Hassan et al, 2014; FAO AQUASTAT, 2012; Daoudy, 2020). To ensure the continued meeting of production targets in this period, plans were drawn up for crop rotations for the main products and the state set prices for important crops such as cotton and wheat (Aw-Hassan et al, 2014). In synthesis, farmers in the official state production schemes were directly subsidized on seeds, equipment, and fuel (Aw-Hassan et al, 2014; Daoudy, 2020; Barnes, 2009). Importantly, participation promoted access to well licenses (which were often distributed at the expense of drilling restrictions) necessary to tap groundwater resources (Aw-Hassan et al, 2014). Roughly 75% of pumping, drilling, and rig equipment needed for drilling wells were powered by diesel

generators while the remaining 25% used electricity (NAPC, 2003:36). Out of all the agricultural subsidies provided by the state during the 1990s, the largest was applied to diesel, creating a massive incentive to utilise groundwater resources (Aw-Hassan et al, 2014).

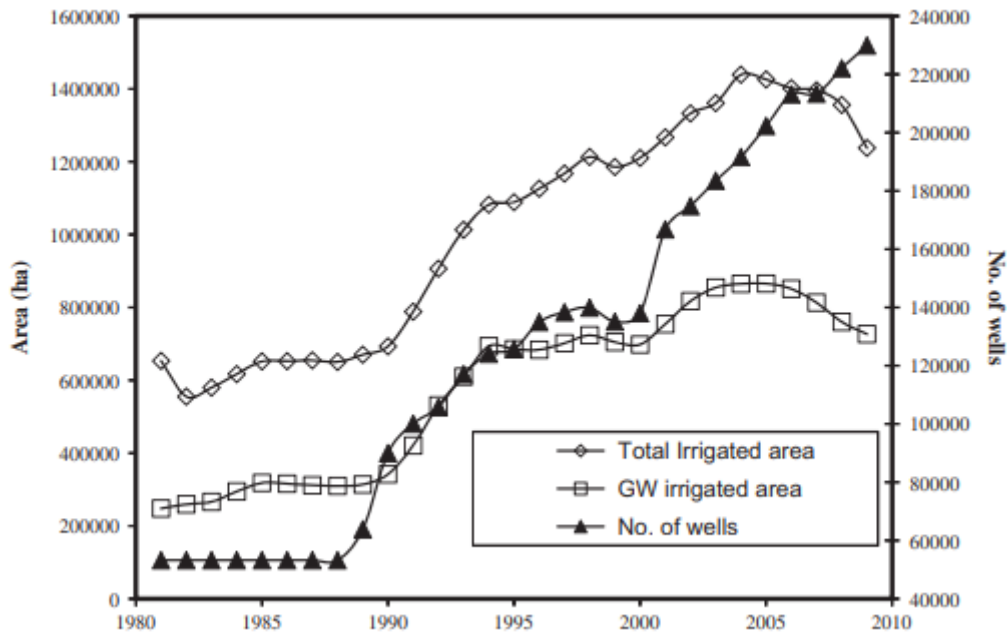


Figure 5: Total irrigated area, groundwater irrigated area, and number of wells in Syria. Source: Aw-Hassan et al, 2014.

In this period groundwater-irrigated areas and the expansion of well systems grew at an annual rate of 15% (Aw-Hassan et al, 2014). At the end of the 1990s, irrigated land had doubled from 1984, coinciding with more fertiliser use, increased wheat and cotton growth, and the exploitation of groundwater resources (Mazid et al, 2003; Barnes, 2009; Beaumont, 1996). By 1994, the number of wells had increased by approximately 71,000 from 1988 while the total area of irrigated land more than doubled to over 700,000 hectares over the same timescale (Aw-Hassan et al, 2014; Amery, 2019). This had positive effects on crops grown in the winter rainfall season as irrigation increased and stabilised production which may have otherwise suffered from uncertain rainfall (Perrier and Salkini, 1991). Additionally, during this period, cotton production increased at rates of 6% per year (160,000 tonnes to

230,000) while wheat increased by around 15% a year to over 4 million tonnes (Aw-Hassan et al, 2014).

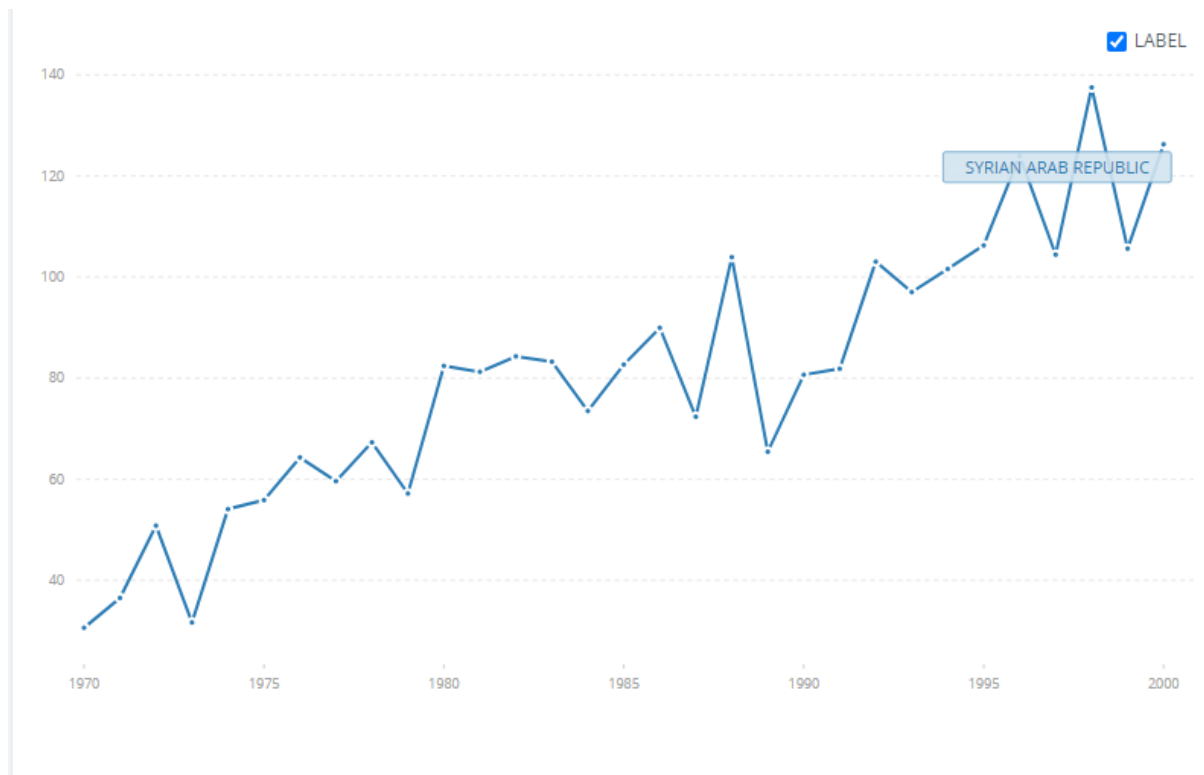


Figure 6: Crop production index: Syrian Arab Republic 1970-2000. Source: World Bank Data, N.D.

The expansion of groundwater irrigation and infrastructural irrigation over this period did have a positive effect on productive agricultural output. Government policy was a success in this regard. Rural and vulnerable areas of the country were able to access safe water because of state policy and investment. In fact, Batatu (1999) states 54 percent of rural populations and 97 percent of urban dwellers had access to piped water. Yet, the evidence is clear, and the argument remains. The Syrian government's pursuit of certain policies it deemed necessary to the security of an otherwise vulnerable and permeable subaltern state has had considerably adverse effects on the availability of water resources in the state: in this case, the state incentivised well drilling which decimated groundwater availability.

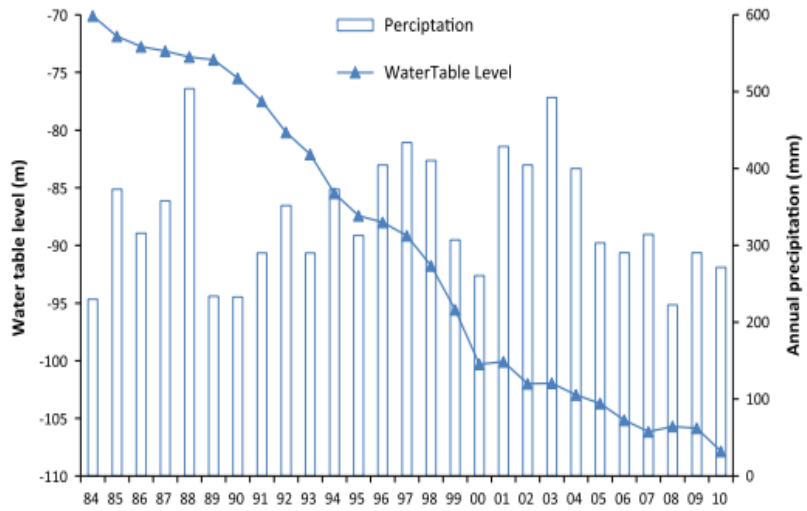


Figure 7: Water table level and annual precipitation at Tel Hadya research station (Aleppo, Syria) 1984-2010. Source: Aw-Hassan et al, 2014.

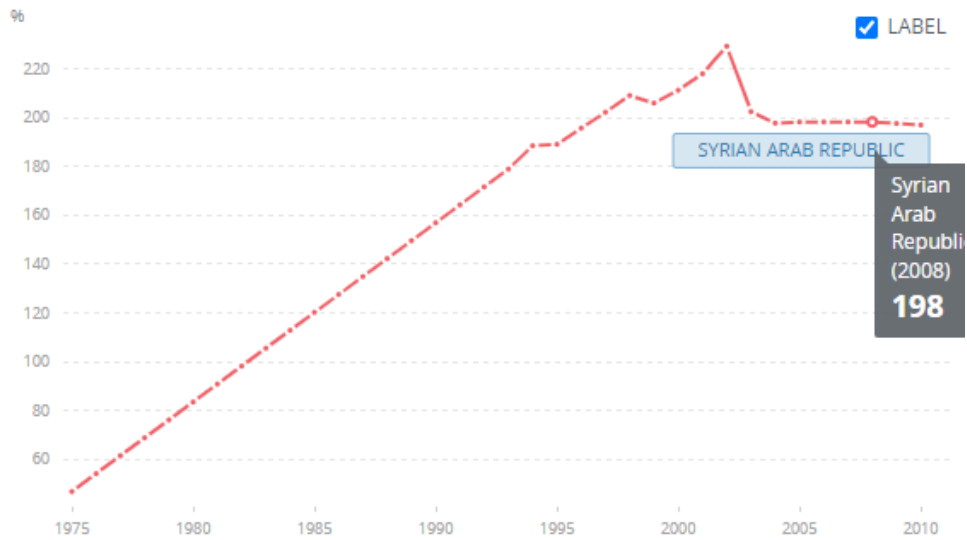


Figure 8: Annual freshwater withdrawals, total (% of internal resource). 1975-2010. Syrian Arab Republic. Source: World Bank Data, N.D.

Economic Liberalization:

Resulting from declining oil prices and the fall of the USSR, Syria entered a period of recession during the 1980s, revealing the fragile institutional foundations of the Syrian development model and creating strong incentives for economic liberalization (Alajaty and Anchor, 2018; Hinnebusch, 1997; Abboud, 2018). Acute dependency on external resources weakened the Syrian pound and the purchasing powers of politically important swaths of the population (Lensink and White, 1999). Resultingly, when the oil prices dropped suddenly in 1986, the weakness of this strategy was exposed (Hinnebusch, 2001). As per Figure 6, the propellant of growth was shut off and the state budget took a nose-dive (Hinnebusch, 2001).

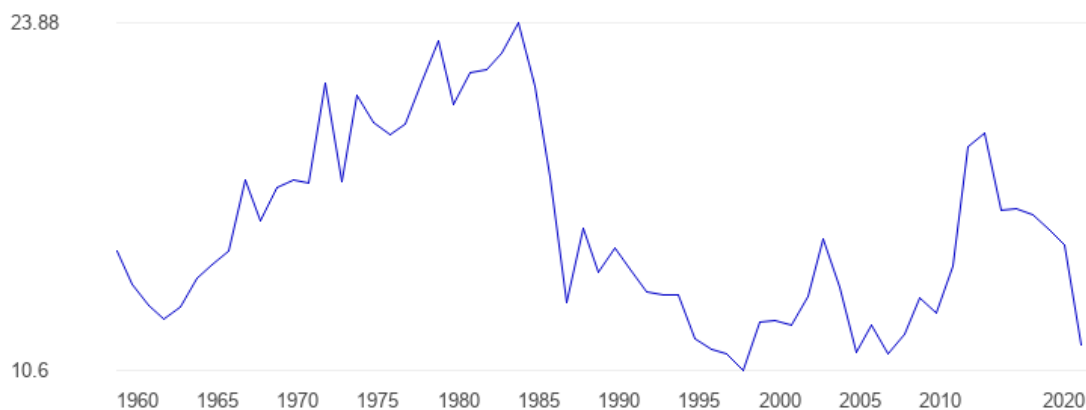


Figure 9: Syrian government spending as a percentage of GDP. Source: *Theglobeconomy.com*, N.D.

From this point onwards, the government pursued a mixture of policies constructing a more liberal and capital-oriented economy, indicative of the state's permeability of international economic forces. Relaxing state control on the private sector while strengthening the role of large enterprise interests and merchants, these decisions increase the burden on the population

(Perthes, 1997; Mahayni, 2013; Daoudy, 2020; Abboud, 2018). Yet the state also had to placate its bureaucratic and mass organizational support networks and was, therefore, unable to dispose of socialist ideological claims (Perthes, 1997). Resultingly, steps of liberalisation had to be taken cautiously. However, the collapse of the Soviet Union in 1991 changed the balance not only on the world stage but in Assad's budget book too, convincing the regime economic liberalization was completely necessary (Mahayni, 2013; Silva and Feraboli, 2021).

Many Arab states were forced into processes of liberalisation to offset the accumulated debts no longer supported by Soviet aid (Murphy, 1994). For states like Syria, anti-American sentiments had to be confined to private spheres and left out of policymaking in order that Syria stand a chance at reintegrating into the world capitalist economy; critical to its survival as a subaltern state in a transforming global landscape (Murphy, 1994; Hinnebusch, 2001). Indeed, the Middle East was either expected to embrace an inevitable universally liberalized global market founded on Western economic and cultural determinism or be deemed ineligible for membership to the new world order. The IMF, heavily influenced by the US, pushed for economic opening to international forces, a domestic restructuring towards liberalization, the retreat of the Syrian state from involvement in the market, and a redefined, much-reduced role for the state (Havrylyshyn, 1997). What we see in this period is the exhaustion of a model favouring rural development and state-building over economic development and the development of sources of accumulation for the government (Abboud, 2018). The state's position became unsustainable through factors in play on the global stage. Syria was forced to respond to shifting international pressures and norms, not having the economic independence to resist such gesticulations. This reveals the state of insecurity present in Syria as hegemonic notions of economic development penetrated the vulnerable

subaltern state, creating the stage upon which water mismanagement and economic liberalization combine post-2000, building pressure and discontent in Syria.

Chapter four - The 2000s:

Introduction:

The ascension of Bashar al-Assad to the presidency followed his father's death in 2000 (Quilliam, 2014). Bashar shifted Syria into a post-Ba'athist era, abandoning the regime's historical rural power base (Daoudy, 2020; Hinnebusch and Zintl, 2015; Sottimano, 2015). Without the ideological and symbolic roots in the rural constituencies, Bashar's regime suffered as economic inequalities began to rise (Ababsa, 2015). Bashar rolled-back decades of central planning, introducing neoliberal policies, and changing the fundamentals of Syrian society (Abboud, 2015; Daoudy, 2020). His mission was to modernize authoritarian Syria through the pursuit of economic liberalization and through a new social basis of the regime based on networks of patronage and privilege (Hinnebusch and Zintl, 2015; Ababsa, 2015). This chapter explores the lead-up to the outbreak of the Syrian civil war and the tensions caused by compounding social, economic, and political factors which can be readily traced back to Syrian water governance – including but not limited to drought, poverty, and the peripheralization of important social forces (Smith and Krampe, 2019; Abboud, 2018). This chapter situates a drought in the Middle East from 2006-2010 within the context of Bashar's social market economy, the last 50 years of state-building and of large-scale over-exploitation of water resources, and the regime's utter failure to recognize this mismanagement (Harris et al, 2013; Smith and Krampe, 2019). In a bid to avoid being overly critical, this chapter opens looking at the benefits accrued by the Syrian population through the expansion of water systems. Then, this chapter contends government policy and failure forged contributing tension to the uprising which fed a brewing discontentment in rural areas as diminished social mobility, welfare, and living standards fell during the 2000s (Abboud, 2015; De Châtel, 2014). Critical to note is Iraq, Israel, Lebanon, Jordan, and Palestine were impacted

by the drought, yet only Syria faced a large-scale humanitarian crisis (Borgomeo et al, 2021). This is due, in part, to 50 years of mismanagement of water resources and the Syrian government's pursuit of liberalization (Selby, 2020; De Châtel, 2014). This chapter stresses that literature focusing on the role of climate change in the socio-political atmosphere of Syria at the time reductively shifts the burden away from the ill effects of Syrian water management and state building since the 1960s (De Châtel, 2014; Selby, 2020).

Benefits of expanded water systems:

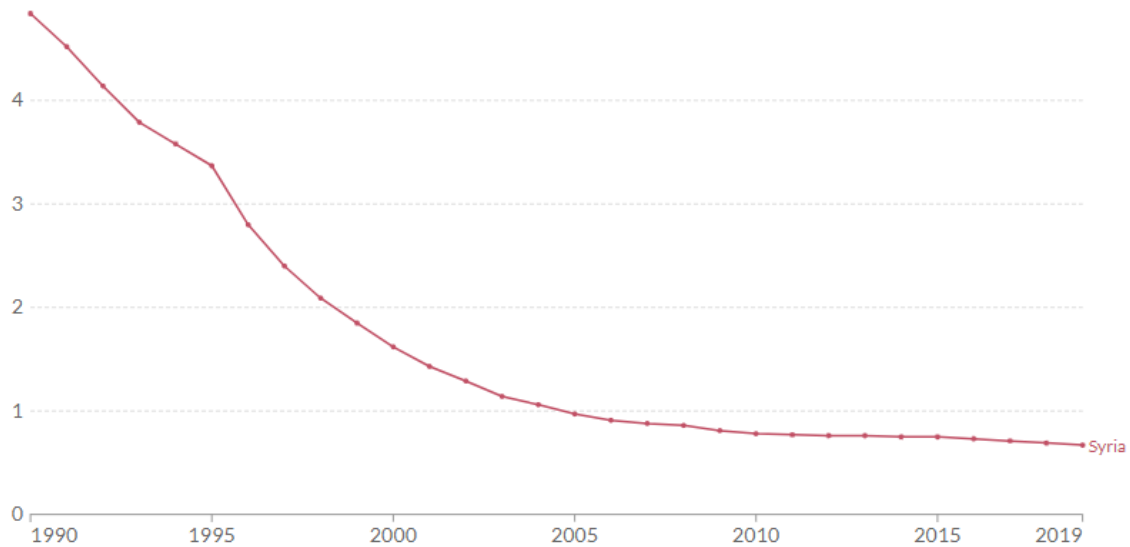
Although this paper critically examines the mismanagement of water resources in Syria, it is important to note the benefits which accumulated in Syria with the expansion of water systems. As the Red Cross notes, before the outbreak of the Syrian civil war, 98% of people in cities and 92% in rural communities had reliable access to safe water (ICRC, 2021).

Death rate from unsafe water sources, 1990 to 2019

Estimated annual number of deaths attributed to unsafe water sources per 100,000 people.

Our World
in Data

+ Add country or region



Source: IHME, Global Burden of Disease (2019)

Note: To allow comparisons over time and between countries with different age-profiles this rate is age-standardized.

OurWorldinData.org/water-access • CC BY

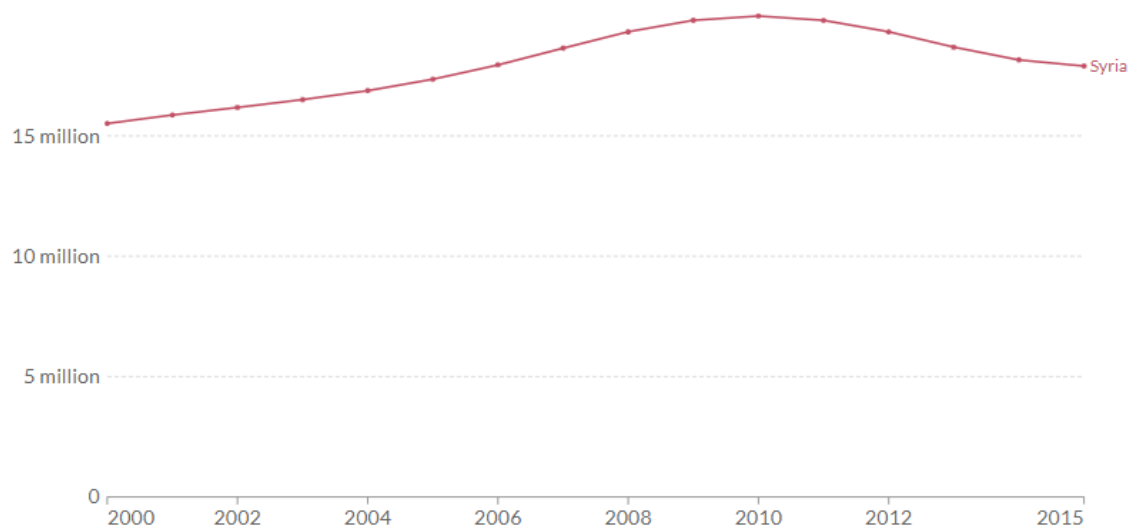
Figure 10: Death rate from unsafe water sources in Syria, 1990- 2019. Source: OurWorldinData (N.D)

Number of people with access to at least basic drinking water, 2000 to 2015

Number of people using at least a basic drinking water source; that is an improved source within 30 minutes' round trip to collect water.

Our World
in Data

+ Add country or region



Source: WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP)

OurWorldinData.org/water-use-stress • CC BY

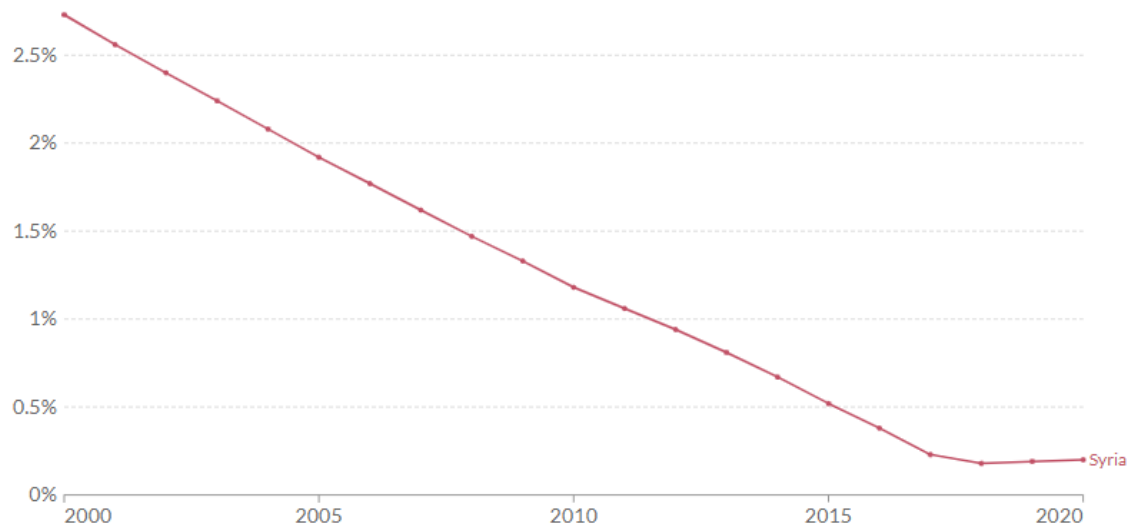
Figure 11: Number of people with access to at least basic drinking water in Syria, 2000-2015. Source: OurWorldinData (N.D)

Share of the population without access to an improved water source

Improved drinking water sources are those that can deliver safe water. They include piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water.

Our World
in Data

+ Add country or region



Source: WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation
OurWorldInData.org/water-access • CC BY

Figure 12: Share of the population without access to an improved water source in Syria, 2000 - 2020. Source: OurWorldInData (N.D)

Figure 10 shows a marked decline in deaths related to unsafe water. Figure 11 illustrates increasing access to drinking water, noting the decline after the outbreak of conflict. Figure 12 shows the rapid decline of population numbers without access to improved water sources although this also includes packaged and delivered water and so may not accurately reflect benefits accrued through expansion of water systems. Therefore, although the Syrian regime mismanagement its water resources, the general population did indeed benefit, if temporarily, from government policy and the expansion of irrigation.

Drought:



Figure 13: Farmers in the drought-ridden region of Hasaka, June 2010. Source: NPR, 2013

The drought between 2006 and 2010 devastated the Syrian north-east, a region both simultaneously the most neglected and the site of the country's breadbasket and oil resources (Smith and Krampe, 2019; NPR, 2013). At the turn of the millennium, poverty levels in this region, and across the state, increased as groundwater levels decreased and over-zealous agricultural pursuits incentivised by the regime ruined land and water resources (Smith and Krampe, 2019; De Chatel, 2014). The drought heavily impacted rural communities and agricultural output. Crop yields fell by 32% in irrigated areas and around 79% in non-irrigated (De Châtel, 2014). Furthermore, the agrarian sector was already weakened by neoliberal economic policies with Syria losing 40% of its agricultural workforce between 2002 and 2008 (Ababsa, 2015). However, this drop is partly due to the exploitation of water and land resources and partly due to new land laws which allowed for temporary contracts (Ababsa, 2015). Poverty rates were high, and malnutrition increased, with UNOCHA (2009)

stating up to 80% of those affected survived on a diet of bread and sugared tea.

The drought crisis highlighted an already ongoing humanitarian issue by revealing trends taking shape for decades. The crisis facing Syria following 2006-2010 is the accumulation of consistent water and land mismanagement and the very end of both the government's state building and its water and agricultural processes which have been explored in the previous chapters (De Chatel, 2014; Selby, 2020; Smith and Krampe, 2019). Although the ongoing climate crisis will cause more frequent and intense droughts, the greater threat to the Syrian state is the failure to justify water use and implement water and environmental laws (Smith and Krampe, 2019; Mann and Toles, 2018). Both the drought and ensuing civil unrest must be seen in the broader framework of rising rural poverty and the long-term, multi-level effects of unsustainable and exploitative Ba'athist agricultural policies subsidy schemes, and state building steps (Selby, 2020; Zawahri, 2019; Mahayni, 2013).

Further Liberalization:

Regime neoliberal shifts redefined the dynamic between the state, society, and the economy (Abboud, 2018). Bashar's 'social market economy' essentially entailed the opening of the Syrian economy to competitive global markets – a shift advocated by public, private, and international actors with various interests, many of which claimed to be on the side of marginalized groups. Yet, the ensuing policy choices often exacerbated the difficulties of such groups (de Elvira and Zintl, 2014; Daoudy, 2020). The 2005 10th Five-year Plan introduced the social market economy into political discourse to confront growing economic issues with intense liberalization (Mahayni, 2013). It was modelled after the Chinese experience of single party authoritarianism and so the Syrian government set to emulate this through reformation

of public institutions and governance policies in key sectors. There is some debate as to whether Chinese economic reforms in the 1980s and 1990s can be called neoliberalism and therefore some contention as to whether we can label the social market economy of Syria as neoliberal (Wu, 2013). Although this model has two opposing elements uncomplimentary to neoliberalism – a market mechanism and a strong state control – the dominance of the market in this model makes the label of neoliberalization accurate (Wu, 2013).

The abrupt nature in which liberalization was undertaken had damaging consequences (Mahayni, 2013). Influential external forces, principally the IMF and World Bank, pressured for Syrian liberalization, stating existing subsidies systems benefited the already rich (Daoudy, 2020; Abboud, 2015; Sottimano, 2015). In 2005, an IMF assessment of the Syrian economy suggested increasing taxation, freezing wages, and reducing oil subsidies, while in the same year the World Bank recommended subsidy reforms were necessary for entry to the World Trade Organization (Daoudy, 2020; Hinnebusch and Zintl, 2015). Furthermore, Bashar's first cabinet placed a World Bank economist as the minister of economy and foreign affair along with other Western educated ministers being appointed (Hinnebusch, 2015; Sottimano, 2015). The private sector saw massive gains at the expense of the public sector yet was unable to provide enough employment to outweigh a shrinking public sector and so poverty increased across the country (Abboud, 2018). This era of Syrian governance demonstrates its permeability and conformity to international, Western-centric norms and ideals governing narratives of development and modernization, clearly to the detriment of vast portions of its population. Although, in part, these changes were born out of economic decline in the 1990s and early 2000s (Mahayni, 2013).

There was little resistance to such ideological change in the Ba'th party as many of the new generation were far from mistrustful of business and thought economic liberalization would increase their opportunities (Hinnebusch, 2015). Structural adjustments supported by

the IMF and the World Bank often leave devastation in their wake as governments abandon commitments to vulnerable and peripheralized populations, placing transnational capital above all else (Horner, 2020; Hurd, 2021; Schild, 2015; Bergeron, 2001). Syrian subaltern susceptibility to international pressures detrimentally impacted both its economy, agricultural sector, and water management: all contributing to rising tensions across the state.

Lack of state safety nets meant the agrarian sector was simply unable to cope (De Châtel, 2014). New land laws dismantled state-owned cooperatives through the 2000s as a December 29th, 2004, law (number 56) allowed the conclusion of all tenancy contracts and the creation of temporary contracts, which was executed in 2007 resulting in the expulsion of hundreds and a massive decrease in agricultural jobs (De Châtel, 2014; Abboud, 2018; Ababsa, 2015). Furthermore, price liberalization rapidly removed state subsidies in 2008 and 2009, a process which was meant to happen gradually over five years from 2007 (Abboud, 2015; Hinnebusch and Zintl, 2015; Mahayni, 2013; Ababsa, 2015). All fuel subsidies stopped in May 2008 and prices for diesel more than tripled overnight from SYP7 to SYP25 (De Chatel, 2014; Abboud, 2018). Separately, government prices of strategic crops exclusively purchased by the state fell by 20% (Daoudy, 2020). In May 2009, chemical fertilizer was liberalized, and prices doubled (De Chatel, 2014). This is reflected in the rising international price for wheat.



Figure 14: International Wheat prices 1999 - 2013 (Price in U.S dollars per bushel). Source: Macrotrends.net

This was all part of planned agricultural deregulation to prepare for Syrian integration into the global economy and World Trade Organization (De Chatel, 2014).

Farmers abandoned land *en masse* as Syria was forced to import wheat in 2008 for the first time in fifteen years (Amery, 2019). Bashar's social market economy had failed; the regime's political important power base was abandoned - admittedly the regime would have had to abandon its fuel subsidy program anyway given the rapid rate of groundwater depletion. However, this is really a case of the consequences of state actions and state building over the last 50 years, while the agricultural sector suffered the impact of a drought illuminating rampant water mismanagement.

Government Denial:

As Syria still occupied subaltern status in the system of states, it was unwilling or unable to acknowledge insecurity of its own making, not wishing to seem weak and out of control of its affairs. The regime was motivated to maintain the narrative of Syrian self-sufficiency in key crops and avoid facing the rapidly spreading environmental and humanitarian disaster caused by fifty years of mismanagement (De Chatel, 2014). The regime's denial of the drought is reflective in motives influencing aspects of policy making and implementation in the water sector. Due to water being considered a strategic resource critical to the subaltern state-building process, accurate information regarding this resource is not available to the public (Mahayni, 2013). Water as a sensitive subject permeates all levels of water management in the regime: officials and experts avoided deeper analysis of water resources across the state, opting instead for reforms of purely surface level characteristics (De Chatel, 2014). The dominant official narrative painted Syria as a modernizing nation working to secure its limited water resources, while evidently the reality was one of the over-exploitations of water and land, increasing poverty, increasing marginalization of rural communities, and a dysfunctional, inflexible water management system bloated by bureaucratic proliferation (De Chatel, 2014; Daoudy, 2020). Narratives of modernization allowed the state to look responsible by letting it acknowledge water systems needed modernization; a smoke screen for its own incompetence (De Chatel, 2014). The fact the regime internally mishandled the outbreak of the self-made political-ecological crisis until 2009 is evidence enough of such sleight of hand (Gurcan, 2018). A widening divide between central authorities and rural areas spurred by Bashar's neoliberal peripheralization of agrarian communities limits the implementation of effective policies and makes oversight difficult (Daoudy, 2020). Meanwhile, the façade of modernization let the Minister of water claim water management

was excellent while groundwater aquifers drained and pollution of both the land and the remaining water increased (De Chatel, 2014; Habib and Ibrahim, 2007). Official discourse was out of sync with a completely defective water sector unable to transform positively while data inaccuracy, lack of resources, untransparent governance, and unaccountability dominate. All of this posturing, in part due to Syria's subaltern statehood, impedes tackling decades of irresponsible water management.

Fifty years of water mismanagement:

From the 1960s onwards Syria, water, and state-building have existed in fraught symbiosis. The rise of the Ba'th regime, over expenditure on militarisation and pervasive securitisation, consolidation of a rural power base, goals of food self-sufficiency, dam construction, changes of power on the global stage, the continuous and overly ambitious expansion of irrigation, the devastating impacts of economic liberalization, drought, and government denial all coalesce into fifty years of water resource mismanagement. Even though the general population saw the benefits of an expanded water system, the Syrian regime has still over-exploited the resource. State-building policy makers have been blind to the limits of Syria's natural resources and have decimated the Syrian breadbasket and water sources. In 2007 alone, Syria's per capita water availability was 882 cubic metres per year, classified as a water-scarce country (Global Water Forum, 2012). Levels of water stress (figure 15: Increased water stress, shown by an increase in the value of the y- axis, has potentially negative effects on the sustainability of the natural resources and on economic development) correlate strongly with that of freshwater withdrawals as seen in earlier figure 8.

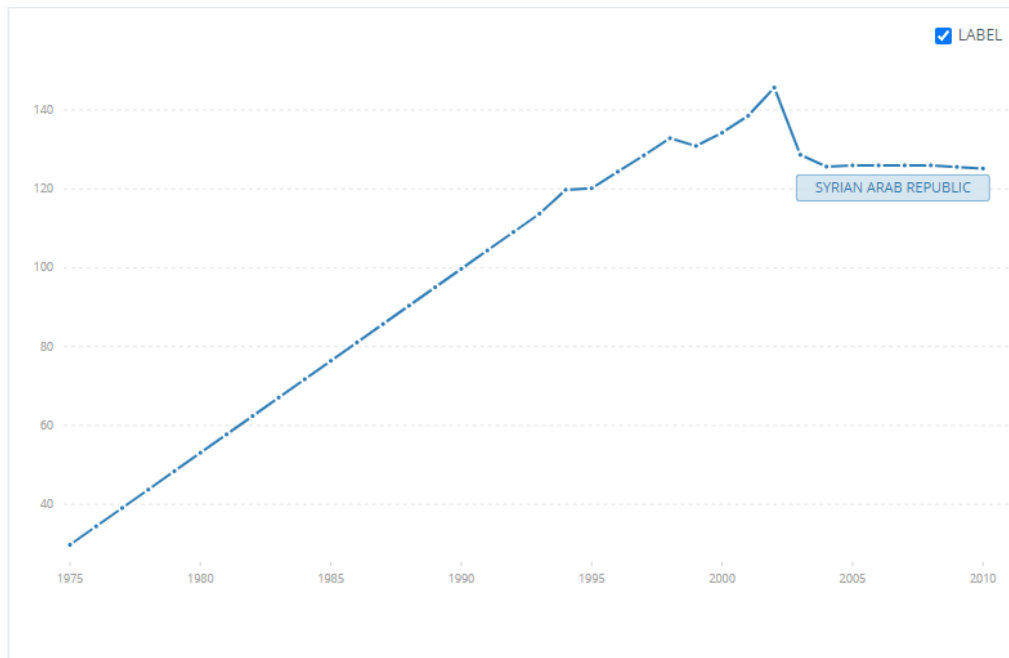


Figure 15: Level of Water Stress: freshwater withdrawal as a proportion of available freshwater resources. Syria, 1975-2010. Source: World Bank Data.

Official narratives overlook decades of mismanagement, instead claiming the desire for food self-sufficiency in the face of a growing population: expecting to reach 37 million in Syria by 2050 (Borgomeo et al, 2021; UNESCO, 2008). Yet wheat and cotton production exceed internal demands and cotton is a non-food water intensive crop: both are grown for export earnings (Index Mundi, N.D). Therefore, water scarcity in Syria is not merely a natural characteristic of its resources and growing population, it is a fabrication born between political, natural, and social factors which could have been easily avoided in the Syrian state building process. (Barnes, 2009). Extensive irrigation has occurred despite extensive proof much of the north-east is unsuitable for intensive irrigation (Hole, 2009; Burdon and Safadi, 1963; Ababsa, 2005).

The bloated and outdated bureaucratic structures of water management in Syria prevent the system from evolving with “22 ministries, councils, commissions, and directorates” involved in water management (De Chatel, 2014: 530). Low education levels in the ministries most influential in water management further exacerbate the problem (De Chatel, 2014). Lack of accountability and institutional corruption lead to inconsistently enforced laws and policies

(Gambill, 2001; Miller, 2017: 3). This has led to over 50 years of unsustainable water use, perhaps most evident in the government's inaction towards the depletion of the country's groundwater reserves. Syria has a Water Legislation to prevent uncoordinated well drilling via licence issuing, yet illegal well drilling was a massive issue pre-civil war due to lack of enforcement (Kharouf-Gaudi, 2013). It also created opportunities for corruption as farmers were often forced to pay a bribe for a license, further contributing to resentment in rural areas (De Chatel, 2014). This type of corruption also meant well numbers increased despite the law (Daoudy, 2020). Groundwater levels dropped as much as 6 meters a year between 1993 and 2000 in areas around Damascus as a result (Amery, 2019; Hobler and Rajab, 2002). What is even more bizarre, the General Organization for Land Development irrigated a further 43,805 ha of land between 2006 and 2010 during the worst of the drought (Ababsa, 2015). Syria consumed 3.5 billion cubic meters of water more than it could naturally replenish in 2007, the deficit being drawn from its groundwater and reservoirs (Ababsa, 2015). In fact, one of the largest karst springs in the world disappeared completely owing to exploitation in the spring catchment area over the period cover in this case study (UNESCWA and BGR, 2013).

It is paramount to contextualise the 2011 Syrian revolt within several compounding factors reaching over five decades to reach a rich understanding of events. The 2006-2010 drought played a pivotal role, yet one must not forsake the forest for the trees. The marriage of an entrenched history of resource exploitation and misused with economic liberalization over the 50 years of this case study illustrates the causes leading to resource depletion and growing discontent in rural constituencies. Regime failure to adequately address a long-building humanitarian and environmental crisis intensified when subsidies were suddenly cancelled, added to decades of rising tension across the state (De Châtel, 2014; Zawahri, 2019; Borgomeo et al, 2021).

Crucially, the governments blind push to expand irrigation over the decades ultimately

worsened conditions for impoverished rural populations, promoting economic and political marginalization and disenfranchisement. The implications of mishandling social and environmental matters related to water had far-reaching consequences, setting of a vicious cycle where water-related challenges intensified pre-existing concerns and contributed to the destabilisation of already fragile contexts (De Châtel, 2014; Zawahri, 2019; Borgomeo et al, 2021).

Drought striking in 2006 aggravated a pre-existing humanitarian crisis and resultantly catalysed the protests of March 2011 (Aljazeera, 2011). The role of the drought is contested; yes, however, this paper stresses the drought exposed underlying issues present in Syria already that may well have contributed to the overbreak of violence regardless of ongoing water shortages. The drought did not singularly start the protests; they were a combination of multi-scalar political, economic, and social grievances compounding over decades. The culmination of these factors was simply too much to bear, leading to the upheaval in Syria.

Conclusion:

The trajectory of Syrian water governance can be interpreted as fifty years of water resource exploitation deeply intertwined with the state-building of a subaltern state struggling for internal and external security. The case study of this project has illustrated how each period of Syrian state building has compounded on the other, leading to water-related problems of the contemporary era. Hafiz Al-Assad's state building in the 1960s and 1970s witnessed the strengthening of a national identity as a method to generate support for external Syrian actions undertaken to remedy the relative powerlessness of Syria in the international and regional state system at the time. Vulnerability to exploitation and manipulation breed militarization which in turn breeds defensive state formation and the accumulation of power to balance against external and internal threats. Agrarian reforms consolidated the regime's legitimacy, its policies functioning to pursue food security and ensure internal stability via the support of key agricultural constituencies. The government also pursued massive water infrastructural projects designed in part to showcase Syria as a strong modern state in line with Western notions of modernisation. Although much of the public did benefit from these projects, they were costly and came at further cost to sustainable water management. Obsessed with notions of security and domestic political order, Syria's subaltern state-building in this period laid the foundations for Syrian mismanagement of water resources.

Shifting international power balances of the 1980s and 1990s altered the interactions of Middle East states with the global system of states. Declining oil prices halted profits on Syria's main export and stunted oil-financed aid from other Arab states. The resulting economic crisis is indicative of the ways in which aid dependency can undermine states. The fall of the USSR in 1990 forced subaltern states in the region to restructure their relationship with the international state system, responding to new balances of power creating insecurity

and uncertainty. Regional changes were highlighted through the outbreak of the 1990-1 Gulf War. This revealed a new hegemon, the US, prompting Syria to embrace Western-oriented policies in a bid to remain secure and sovereign. In this period, the model favouring rural development and state-building over economic development began to stagnate, while the state's position became unsustainable owing to factors on the global stage. Unable to resist shifting international norms and pressures, the Syrian state began a process of liberalization which would have lasting effects in the post-2000 period. Furthermore, the pursuit of groundwater and infrastructural irrigation to appease rural constituents necessary for internal stability had adverse effects on water availability in the state, rapidly depleting groundwater resources.

Finally, analysis of the post-2000 era brings together fifty years of subaltern state-building and water mismanagement, concluding that resource exploitation and government policy intensified pre-existing tensions in rural and urban areas, contributing to the deterioration of already delicate circumstances. The nexus of these compounding factors led to Syrian civil war.

Syrian subaltern state-building may not have been the only way for the regime to develop the state. While considering alternatives for Middle Eastern state-building, the entire regional context would have to change. For instance, if liberal democratic peace had been pursued across the region willingly, there is plausible evidence to suggest institutional development, and therefore resource management, would take a different trajectory (MacGinty, 2006). Admittedly, liberal democratic peace is a potentially unsuitable concept for this region and this period (MacGinty, 2006). Yet, regime type impacts resource distribution and perception of availability (Gizelis and Wooden, 2010). Democracies are better at tackling public concerns, have more responsive governance systems, and stronger domestic institutions which can mitigate environmental scarcity and conflict (Gizelis and

Wooden, 2010). Liberal democratic peace also contends that its implementation reduces the causes of conflict; violent intrastate and interstate conflict has a profound impact on capacity and formation of internal institutions (MacGinty, 2006; Gizelis and Wooden, 2010). To reiterate: if regional contexts were different, states could have pursued different forms of state-building. If pan-Arabism had not been so prevalent and Syria perhaps more open to relations with Israel, issues of security may not have been as pressing. As it stands however, issues of external and internal security permeate the state-building process and thus, subaltern realism as a theory of understanding holds it weight.

Recommendations:

Water is pivotal to the state-building process (Morag, 2001). This is especially the case in the Middle East where water and state building are deeply embedded in regional peace and security (Klimes and Yaari, 2019). As a scarce and necessary resource, all interactions on the use of water are political and vastly important to national security (Klimes and Yaari, 2019). However, the consequences of Syrian state-building and water governance have been damaging. Many have called for the modernisation of Syrian irrigation systems (Mourad and Berndtsson, 2014, Juusola, 2010; World Bank, N.D). This should involve drip irrigation and sprinkler systems with supporting financial incentives with low-interest rates encouraging the implementation of efficient techniques among farmers (Wessels, 2008). Drip irrigation involves the delivery of water to plants at ground level in a precise and efficient manner, using 30 to 50% less water (DripWorks, 2020). Rainwater could be harvested to be used for

agriculture or to recharge aquifers (Mourad and Berndtsson, 2014). In a scenario where rainwater harvesting is utilised between 2020 and 2050, Syria could overcome its water shortages (Mourad and Berndtsson, 2014). The government could also replace open irrigation systems with pressurized pipe systems and consider applying fees to farmers exceeding a maximum water allocation per hectare (Daoudy, 2020; Aw-Hassan et al, 2014).

However, this paper is particularly interested in the practicalities of rehabilitating ancient hydraulic structures via either the reinstatement of old systems or the development of new projects (de Miranda, 2023). Qanats are subterranean channels introduced to Syria in the sixth century during the Persian empire. They tap groundwater which flows into the tunnel and arrives by gravity to human and agricultural settlements (de Miranda, 2023). Many of these structures are well-preserved and are both environmentally friendly and sustainable (de Miranda, 2023; Wessels and Hoogeveen, 2003). As the water flows without pumping or mechanical aid, the qanat cannot force water out of the aquifer at unsustainable rates (de Miranda, 2023). Use of these more traditional methods of water supply has declined in Syria and mechanical pumping is a threat to the usage of qanats which rely on stable groundwater levels (Wessels and Hoogeveen, 2003).

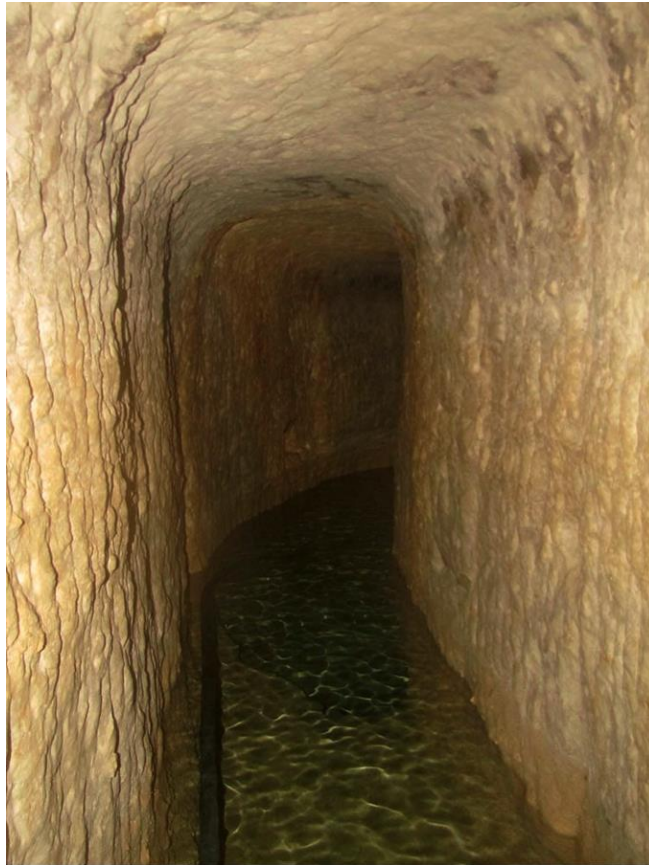


Figure 166: Qanat tunnel. Source: CleanRiversTrust N.D

Academic consensus dictates that the restoration of such systems would rehabilitate and reinforce the resilience of ecosystems in Syria, as well as providing steady socio-economic support to communities dependent on irrigated crops (Vohland and Barry, 2009). It is also economically and environmentally beneficial to improve the efficiency of these existing systems rather than constructing new ones (Rosengrant, 1997). Much of the withdrawal infrastructure remains, however, new networks would require expansion. The combination of new technologies such as drip irrigation and sprinkler systems with the qanat canals to farms would be a highly efficient way of managing water resources while also promoting the agricultural expansion so critical to state building in Syria and in the region generally. However, Wessel and Hoogeveen (2003) stress that many died in the creation of the ancient water systems, rightly suggesting reconstruction and renovation should have

ample safety measures. They further suggest clear ownership of the systems as a condition necessary to mitigate conflict over claiming ownership when water is bountiful.

Implications:

The MENA region is one of the most water-stressed in the world. Current systems of water management, plagued by weak governance, constricted resources, and degraded infrastructure, are failing when they are needed the most (World Bank, 2018). This paper illustrates that water governance and state-building in the region requires a focus on sustainable resource management considering errors made in the past – as evident in the Syrian case study. Ancient qanat systems are found in Iran, Afghanistan, Oman, Algeria, Pakistan, Morocco, and Saudi Arabia (Remini et al, 2014; WorldAtlas N.D). This case study is especially applicable in Iran, an agrarian society, where irrigated production is a source of wealth and a sensitive factor in production (Khaneiki and Al-Ghafri, 2022). As states in the region continue to develop, let this paper be a first step in understanding the pitfalls of unsustainable water management coupled with state-building; and a first step in welding the past with the present.

Bibliography

- Ababsa, M (2005) Frontiers of development: the adaption of the Ba'thist project to tribal logics in the pioneering front of the Jazira. *A Contrario* vol.3 pp.11-25
<<https://www.cairn.info/revue-a-contrario-2005-2-page-11.htm>>.
- Ababsa, M (2015) The End of a World: Drought and Agrarian Transformation in Northeast Syria (2007-10) in *Syria from Reform to Revolt, Volume 1: Political economy and International Relations*. Ed by Raymond Hinnebusch and Tina Zint. New York: Syracuse University Press, pp. 192-222.
- Abboud, S. N, (2015) Locating the “social” in the social market economy in *Syria from Reform to Revolt, Volume 1: Political economy and International Relations*. Ed. by Raymond Hinnebusch and Tina Zintl. New York: Syracuse University Press, pp. 45-65.
- Abboud, S. N. (2018) *Syria*. Second edition. Cambridge, United Kingdom: Polity Press.
- Acemoglu, D. & Robinson, J. A. (2012) *Why nations fail: the origins of power, prosperity, and poverty*. New York: Currency.
- Achen, C., and D. Snidal (1989) Rational Deterrence Theory and Comparative Case Studies. *World Politics*, 41(2) pp.143–169.
- Akbarzadeh, S (2019) The Blurred Line Between State Identity and Realpolitik. *Routledge Handbook of International Relations in the Middle East* ed. by Shahram Akbarzadeh. Routledge, Oxen. pp. 1-7.

Alajaty, M and Anchor, J (2018) Transition economies in the Middle East: The Syrian experience. *Post-Communist Economies*, 30(3), pp.382-394,
<DOI: [10.1080/14631377.2018.1442052](https://doi.org/10.1080/14631377.2018.1442052) >.

Aljazeera (2001) *Disaster Looms in Syria as Euphrates Dwindles*. Available at:
<https://www.aljazeera.com/gallery/2021/8/30/drying-euphrates-syria-disaster>
[Accessed 10th July 2023].

Aljazeera (2011) *Violence erupts at protests in Syria* Available at:
<https://www.aljazeera.com/news/2011/3/18/violence-erupts-at-protests-in-syria>
[Accessed 25th July 2023].

Allin, D. H. & Simon, S. (2003) The moral psychology of US support for Israel. *Survival (London)*. 45 (3), pp.123–144.

Allouche, J. (2019) State building, nation making and post-colonial hydropolitics in India and Israel: Visible and hidden form of violence at multiple scales. *Political Geography*, 75 (1). pp.1-7 < <https://doi.org/10.1016/j.polgeo.2019.102051> > .

Altug, S. The Turkish-Syrian Border and Politics of Difference in Turkey and Syria (1921-1939) *Syria: Borders, Boundaries, and the State* ed. By Cimino, M. Cham: Springer International Publishing. <https://link-springer-com.ezproxy-s1.stir.ac.uk/book/10.1007/978-3-030-44877-6>

American University International Law Review (2001) *The Report of the World Commission on Dams – Executive Summary*. Available at:
<https://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=1253&context=auilr> [Accessed 11th July 2023].

Amery, H. A (2019) Food security in the Middle East in *Routledge Handbook of Middle East Security* ed. By Jagerskog, A, et all. Oxon: Routledge, pp.182-196.

- Antonelli, M. & Tamea, S. (2015) Food-water security and virtual water trade in the Middle East and North Africa. *International journal of water resources development*. 31 (3), pp. 326–342
- Aw-Hassan, A et. al. (2014) The Impact of food and agricultural policies on groundwater use in Syria. *Journal of Hydrology* 513(1) pp.204-215
<<https://doi.org/10.1016/j.jhydrol.2014.03.043>.>
- Axon, A. and Hewitt, S. (2018) *Syria 1975/76-2018*. BRILL, Boston.
- Ayoob, M (1995) *The Third World Security Predicament: State making, Regional Conflict, and the International System*. Lynne Rienner Publishers, London.
- Ayoob, M (2019) Subaltern Realism Meets the Arab World. *Routledge Handbook of International Relations in the Middle East* ed. by Shahram Akbarzadeh. Routledge, Oxen., pp. 59-69.
- Ayoob, M. (2002). Theorizing in International Relations: A Case for Subaltern Realism. *International Studies Review*. 4 (3), pp. 27-48 <<https://www.jstor.org/stable/3186462> >
- Bakker, J. (2000). Privatizing Water, Producing Scarcity: The Yorkshire Drought of 1995. *Economic Geography*, 76(1), pp. 4-27. <<https://doi.org/10.2307/144538>>
- Bakker, K (2008) Splintered Networks: The Colonial and Contemporary Waters of Jakarta. *Geoforum* 39(6), pp. 1843-1858 < <https://doi.org/10.1016/j.geoforum.2008.07.012>>.
- Barnes, J (2009) Managing the Waters of Ba'th Country: The Politics of Water Scarcity in Syria. *Geopolitics*. 14(3), pp. 510-530 < DOI: 10.1080/14650040802694117>
- Barnett, J. & Adger, W.N. (2007) Climate change, human security, and violent conflict. *Political Geography*. 26 (6), pp. 639–655. <doi:10.1016/j.polgeo.2007.03.003.>

- Barrington, G., Shimoni, R. and Legaspi, A., (2014) *Case Study Site Selection: Using an Evidence-Based Approach in Health-Care Settings*. London: Sage Publications, Inc.
<<https://doi.org/10.4135/978144627305013510255>>
- Bass, W. (2003) *Support any friend : Kennedy's Middle East and the making of the U.S.-Israel alliance*. Oxford: Oxford University Press
- Batatu, H. (1999) *Syria's peasantry, the descendants of its lesser rural notables, and their politics*. Princeton: Princeton University Press.
- BBC News (2011) *Syria Protests: The forgotten decades of dissent* Available at:
<https://www.bbc.co.uk/news/world-middle-east-12890797> [Accessed 25th July 2023].
- Beaumont, P (1996) Agricultural and environment changes in the upper Euphrates catchment of Turkey and Syria and their political and economic implications. *Applied Geography* 16(2), pp.137-157 <[https://doi.org/10.1016/0143-6228\(95\)00033-X](https://doi.org/10.1016/0143-6228(95)00033-X).>
- Bennett, A. (2004). Case Study Methods: Design, Use, and Comparative Advantages. In D. F. Sprinz, & Y. Wolinsky-Nahmias (Eds.), *Models, Numbers, and Cases: Methods for Studying International Relations* ed. by D. F. Sprinz, & Y. Wolinsky-Nahmias Ann Arbor: The University of Michigan Press.
- Bennett, A., & Elman, C. (2007). Case Study Methods in the International Relations Subfield. *Comparative Political Studies*, 40(2), pp.170- 195.
<<https://doi.org/10.1177/0010414006296346>.>
- Bergeron, S. (2001), Political Economy Discourses of Globalization and Feminist Politics. *Signs (Chicago, Ill.)*. 26 (4), pp.983–1006, < <https://doi.org/10.1086/495645>>
- Böhmelt, t., Bernauer, t., Buhaug, h., Gleditsch, n.p., Tribaldos, t. & Wischnath, g. (2014) Demand, supply, and restraint: Determinants of domestic water conflict and

- cooperation: Climate change, water, conflict, and security. *Global Environmental Change*. 29, pp.337–348.
- Borgomeo, E. et al. (2021) Ebb and Flow: Volume 2. *Water in the Shadow of Conflict in the Middle East and North Africa*. 1st ed. World Bank Publications.
- Brockett, C. D. (1991). The Structure of Political Opportunities and Peasant Mobilization in Central America. *Comparative Politics*, 23(3), pp.253–274.
<https://doi.org/10.2307/422086>.
- Burdon, D and Safadi, C (1963) Ras-el-Ain: The great karst spring of Mesopotamia: An Hydrogeological study. *Journal of Hydrology* 1(1) pp. 58-64
<[https://doi.org/10.1016/0022-1694\(63\)90033-7](https://doi.org/10.1016/0022-1694(63)90033-7) >
- Can, S (2020) Spatialization of Ethno-Religious and Political Boundaries at the Turkish-Syrian Border in *Syria: Borders Boundaries, and the State* ed by Cimino, M. Cham: Springer International Publishing, pp.127-149.
- Cimino, M (2020), Introduction. *Syria: Borders, Boundaries, and the State* ed. By Cimino, M. Cham: Springer International Publishing, pp.1-24
- Clapp, J. (2017) Food self-sufficiency: Making sense of it, and when it makes sense. *Food policy*. 66(1), pp.88-96.
- CleanRiversTrust (N.D) *Qanat*. Available at: [Qanat | Clean Rivers Trust](#) [Accessed: 3rd August 2023]
- Cook, P. (n.d.) War or peace? In Syria, water flows both ways. *The Water We Share* – Report no. 4. Geneva Solutions. Available at <https://bit.ly/3Q8GPmb> [Accessed 18th April].
- Cotillon, J (1993) Water from Dams in Syria, Brochure prepared by J. Cotillon, Secretary General, International Commission on Large Dams, with assistance from the Syrian Committee on Large Dams and the Ministry of Irrigation in Syria, to coincide with the

61st Executive Meeting, Cairo, Nov. 1993. Paris: Commission Internationale des Grands Barrages 1993

Daoudy, M. (2020) *The origins of the Syrian conflict: climate change and human security*. Cambridge, United Kingdom: Cambridge University Press.

De Châtel, F (2014) The Role of Drought and Climate Change in the Syrian Uprising: Untangling the Triggers of the Revolution. *Middle Eastern Studies*, 50(4), pp. 521-535, DOI: [10.1080/00263206.2013.850076](https://doi.org/10.1080/00263206.2013.850076)

de Elvira, L. R., & Zintl, T. (2014). The end of the ba 'thist social contract in bashar al-asad's syria: reading sociopolitical transformations through charities and broader benevolent activism. *International Journal of Middle East Studies*, 46(2), pp. 329–349.
<http://www.jstor.org/stable/43303145>

de Miranda, A. (2023). Intrinsic Resilience in Levant Water-Based Infrastructures. *Environmental Science*. 21(1) pp. 92-93
<http://dx.doi.org/10.3390/environsciproc2022021092>

Delatolla, A. (2021) *Civilization and the Making of the State in Lebanon and Syria*. 1st ed. 2021. Cham: Springer International Publishing

Dodge, T and Wasser, B (2014) The Crisis of the Iraqi State. *Adelphi Papers*. 54 (447), pp.13-38 < DOI: 10.1080/19445571.2014.995936 >

DripWorks (2020) *The Benefits of Drip Irrigation*. Available at: <https://www.dripworks.com/blog/the-benefits-of-drip-irrigation> [Accessed 2nd August 2023].

Droz-Vincent, P (2019) Security and Syria in *Routledge Handbook on Middle East Security*. Security ed. By Jagerskog, A, et all. Oxon: Routledge, pp.111-125

- Fantini, E et al (2018) Big Projects, Strong states? Large-scale investments in irrigation and state formation in the Beles Valley, Ethiopia in *Water, technology, and the nation-state*. Filippo Menga & E. (Erik) Swyngedouw (eds.). Abingdon, Oxon, United Kingdom: Routledge, pp. 65-81
- FAO (1999) *Implications of Economic Policy for Food security: A training manual* Available at: [Implications of Economic Policy for Food Security : A Training Manual \(fao.org\)](#) [Accessed 3rd August 2023].
- FAO (2012) *AQUASTAT*. Available at: [AQUASTAT - FAO's Global Information System on Water and Agriculture](#) [Accessed 3rd August 2023].
- Ferreira, M, Silva, E (2023) Russia and the Syrian Civil War: The Russian position on the United Nations Security Council. *Journal of the Global South*. 14(65) pp.32-48 <<https://doi.org/10.22456/2178-8839>>
- Fetzek, S. & Mazo, J. (2014) Climate, Scarcity and Conflict. *Survival (London)*. 56 (5), pp. 143–170. < DOI: 10.1080/00396338.2014.962803>
- Fukuyama, F. (2018). Why National Identity Matters. *Journal of Democracy*, 29(4) pp.5-15.
- Gambill, G (2001) The Political Obstacles to Economic Reform in Syria. *Middle East Intelligence Bulletin*. 3(7) <https://www.meforum.org/meib/articles/0107_s1.htm>
- Gizelis, T.-I. & Wooden, A. E. (2010) Water resources, institutions, & intrastate conflict. *Political geography*. 29 (8), pp. 444–453. <DOI: 10.1016/j.polgeo.2010.10.005>
- Gleick, P. H. (2019) Water as a weapon and casualty of armed conflict: A review of recent water-related violence in Iraq, Syria, and Yemen. *Wiley interdisciplinary reviews. Water*. 6 (4), pp.1-15 DOI: 10.1002/wat2.1351

- Global Water Forum (2012) *Understanding Water Scarcity* Available at:
https://www.iwmi.cgiar.org/News_Room/pdf/Understanding_water_scarcity.pdf [
Accessed: 19th July 2023]
- Gongora, T. (1997). War Making and State Power in the Contemporary Middle East. *International Journal of Middle East Studies*, 29(3) pp. 323-340.
doi:10.1017/S0020743800064795
- Grovogui, S. Postcolonialism. *International Relations Theories: Discipline and Diversity*. 3rd ed. Ed. by Tim Dunne, Milja Kurki and Steve Smith. Oxford: Oxford University Press. pp.247-266.
- Gürcan, E. C. (2019) Extractivism, Neoliberalism, and the Environment: Revisiting the Syrian Conflict from an Ecological Justice Perspective. *Capitalism Nature Socialism*, 30(3), pp. 91-109, DOI: [10.1080/10455752.2018.1516794](https://doi.org/10.1080/10455752.2018.1516794)
- Gutfeld, A. (2017) From ‘Star Wars’ to ‘Iron Dome’: US support of Israel’s Missile Defense systems. *Middle Eastern studies*. 53 (6), pp.934–948.
- Habib, L. & Ibrahim, W. (2007). *Status of soil resource in Syria Assessment of existing soil information system*. 10.13140/RG.2.1.1996.1047.
- Haines, D. (2011) Concrete ‘progress’: Irrigation, development, and modernity in mid-twentieth century Sind. *Modern Asian Studies*, 45(1), pp.179-200.
<doi:10.1017/S0026749X10000259>
- Hama, H. H. (2020). The Securitization and De-Securitization of Kurdish Societal Security in Turkey, Iraq, Iran, And Syria. *World Affairs*, 183(4), pp.291–314.
<https://doi.org/10.1177/0043820020962772>
- Hameed, M. et al. (2019) A Review of the 21st Century Challenges in the Food-Energy-Water Security in the Middle East. *Water*, 11(4), pp.1-20 DOI: 10.3390/w11040682

- Harris, L. (2008) Modernizing the Nation: Postcolonialism, (Post)Development, and Ambivalent Spaces of Difference in Southeastern Turkey. *Geoforum* 39(5) pp. 1698-1708 <doi:10.1016/j.geoforum.2008.03.002>
- Harris, LM, Goldin, JA, & Sneddon, C (eds) 2013, *Contemporary Water Governance in the Global South : Scarcity, Marketization and Participation*, Taylor & Francis Group, London.
- Havrylyshyn, O (1997) *IMF report: A Global Integration Strategy for the Mediterranean Countries: Open Trade and Market Reform*. Available at: <https://www.imf.org/en/Publications/Books/Issues/2016/12/30/A-Global-Integration-Strategy-for-the-Mediterranean-Countries-Open-Trade-and-Market-Reforms-2292> [Accessed 9th July 2023].
- Hayes, J. (2013) Securitization, Identity, and Security Outcomes in *Constructing National Security: U.S. Relations with India and China*. Cambridge: Cambridge University Press, pp. 13–46. doi: 10.1017/CBO9781139628969.003.
- Helfont, S. (N.D) Post-Colonial States and the Struggle for Identity in the Middle East since World War Two. *Foreign Policy Research Institute*. Available at: <https://www.fpri.org/article/2015/10/post-colonial-states-and-the-struggle-for-identity-in-the-middle-east-since-world-war-two/> [Accessed 18th April 2023].
- Henderson, E. A., & Singer, J. D. (2000) Civil War in the Post-Colonial World, 1946-92. *Journal of Peace Research*, 37(3), pp. 275–299. <http://www.jstor.org/stable/425346>
- Henderson, E., and Singer, J. (2000) Civil War in the Post-Colonial World, 1946-92. *Journal of Peace Research*. 37 (3), pp. 275-299. < <https://www.jstor.org/stable/425346> >
- Heydemann, S. (2000) Introduction. *War, Institutions, and Social Change in the Middle East* University of California Press, Berkeley.

- Heydemann, S. (2000) War, Keynesianism and Colonialism: Explaining state-market relations in the Post-war Middle East. *War, Institutions, and Social Change in the Middle East* ed by Heydemann, S. University of California Press, Berkeley, pp.100-146.
- Hinnebusch, R (1994) Egypt, Syria, and the Arab State System in the New World Order in *The Middle East in the New World Order* ed by Haifaa A Jawad. Macmillan Press: London.
- Hinnebusch, R (2003) *The International Politics of the Middle East*. Manchester: Manchester University press
- Hinnebusch, R (2015) President and Party in Post-Baithist Syria: From the struggle for “reform” to regime deconstruction in *Syria from Reform to Revolt, Volume 1: Political economy and International Relations*. Ed by Raymond Hinnebusch and Tina Zintl. New York: Syracuse University Press, pp.21-44.
- Hinnebusch, R and Zintl, T (2015) Introduction in *Syria from Reform to Revolt, Volume 1: Political economy and International Relations*. Ed. by Raymond Hinnebusch and Tina Zintl. New York: Syracuse University Press, pp.1-18.
- Hinnebusch, R. (1982) Rural Politics in Ba’thist Syria: A Case Study in the Role of the Countryside in the Political Development of Arab Societies. *The Review of Politics*, 44(1), pp. 110–130. <http://www.jstor.org/stable/1406871>.
- Hinnebusch, R. (2001) *Syria: Revolution from Above*. Routledge: London.
- Hinnebusch, R. A. (1997). Syria: The Politics of Economic Liberalisation. *Third World Quarterly*, 18(2), pp. 249–265. <http://www.jstor.org/stable/3993222>

- Hobler, M. and Rajab, R. (2002) Groundwater Vulnerability and Hazards to Groundwater in the Damascus Ghouta Plain in Syria, *Arab Center for the Study of Arid Zones, and Dry Lands and Bundesanstalt für Geowissenschaften und Rohstoffe*.
- Hole, F (2009) Driver of Unsustainable Land use in the Semi-arid Khabur River Basin, Syria. *Geographical research* 47(1), pp. 4-14. <<https://doi.org/10.1111/j.1745-5871.2008.00550.x>>
- Horner, R (2020), Towards a new paradigm of global development? Beyond the limits of international development. *Progress in Human Geography*, 44 (3), pp.415-436 <<https://doi.org/10.1177/0309132519836158>>.
- Hurd, I (2021). The WTO, and The IMF and World Bank. *International organizations: politics, law, practice*. Fourth edition. Cambridge: Cambridge University Press
- ICRC (2021) *Syria water crisis: Up to 40% less drinking water after 10 years of war*. Available at: [Syria: Up to 40% less drinking water after 10 years of war | ICRC](#) [Accessed 27th July 2023].
- IDH (N.D) *Cotton: Retailers and Brands Investing in a Mainstream Sustainable Cotton Market* Available at: <https://www.idhsustainabletrade.com/sectors/cotton/> [Accessed 12th July 2023].
- Index Mundi (N.D) *Syrian Arab Republic Cotton Production by Year* Available at: <https://www.indexmundi.com/agriculture/?country=sy&commodity=cotton&graph=production> [Accessed 17th July 2023].
- Index Mundi (N.D) *Syrian Arab Republic Wheat Production by Year*. Available at: <https://www.indexmundi.com/agriculture/?country=sy&commodity=wheat&graph=production> [Accessed 17th July 2023].

- Juusola, H (2010) The internal Dimensions of water security: the drought crisis in Northeastern Syria in *Managing Blue Gold: New Perspectives on Water Security in the Levantine Middle East* ed. By Mari Luomi. The Finnish Institute of International Affairs, Helsinki, pp.21-35.
- Karsh, E. (1988) *The Soviet Union and Syria (RLE Syria)*. London: Routledge.
- Keilany, Z (1980) Land reform in Syria. *Middle Eastern Studies*, 16(3), pp. 209-224, DOI: [10.1080/00263208008700447](https://doi.org/10.1080/00263208008700447)
- Keulertz, M. and Allan, T. (2019) The Water-Energy-Food Nexus in the MENA Region: Securities of the Future. *Routledge Handbook of Middle East Security* ed. By Jagerskog, A, et all. Oxon: Routledge.
- Keulertz, M. and Allan, T. (2019) The Water-Energy-Food Nexus in the MENA Region: Securities of the Future. *Routledge Handbook of Middle East Security* ed. By Jagerskog, A, et all. Oxon: Routledge, pp.157 – 166.
- Khaneiki, M. and Al-Ghafri, A (2022) The Circle of water justice in the history of Iran. *Water Security* 16(1), pp.1-8 <https://doi.org/10.1016/j.wasec.2022.100122>.
- Kharouf-Gaudig, R (2013) Water Management Laws in the Syrian Arab republic. *Water law and cooperation in the Euphrates-Tigris region: a comparative and interdisciplinary approach*, Leiden: Martinus Nijhoff Publishers
- Klaz, B. S. and Abdennabi, M. (2020) “The Country Should Unite First”: Pan-Arabism, State and Territory in Syria Under the Baath Rules in *Syria: Borders Boundaries, and the State* ed by Matthieu Cimino. Cham: Springer International Publishing AG, pp.93-105.

- Klimes, M. Yaari, E (2019) Water and security in the Middle East: opportunities and challenges for water diplomacy in *Routledge Handbook of Middle East Security* ed. By Jagerskog, A, et all. Oxon: Routledge, pp. 234-248.
- Lange, K (2019) Submerged memories: Memory, history, and displacement around Lake Asad, Syria. *Memory Studies* 12(3) pp. 322-335 doi.org/10.1177/175069801983
- Lawson, F.H., (1990) From Neo-Ba'th Nouveau: Hafiz al-Asad's Second Decade. *Journal of South Asian and Middle Eastern Studies*, 14(2), pp. 21.
- Lensink, R, White, H (1999) *Aid Dependence. Issues and Indicators*. Stockholm: Almqvist and Wiksell international.
- https://cdn.openaid.se/app/uploads/2020/09/29115924/1999-01-01_Aid_Dependence_%E2%80%93_Issues_and_Indicators.pdf
- Leonid L. (2021) The Modernization Theory Paradigm and Its Discontents: Reviewing the Contribution and Fallings of the Modernization Theory to Social and Political Research. *Ukrainian Policymaker*, 8 (1) pp.41-50. < <https://doi.org/10.29202/up/8/5> >
- Liu, J., Wiberg, D., Zehnder, A.J.B. et. al (2007) Modelling the role of irrigation in winter wheat yield, crop water productivity, and production in China. *Irrigation Science*, 1(1) pp.21–33. <https://doi.org/10.1007/s00271-007-0069-9>
- Ma'oz, M (1999) From Conflict to Peace? Israel's Relations with Syria and the Palestinians. *The Middle East Journal*. 53 (3), pp.393–416.
- Mac Ginty, R. (2006) *No war, no peace: the rejuvenation of stalled peace processes and peace accords*. Baskingstoke: Palgrave Macmillan.

Macrotrends.net (N.D) *Wheat Prices – 40 year Historical Chart* Available at: [Wheat Prices - 40 Year Historical Chart | MacroTrends](#) [Accessed 27th July 2023]

Mahayni, B. (2013) Tensions in narratives and lived realities of water crisis in Damascus. *Contemporary Water Governance in the Global South*. 1st edition. Routledge. pp. 45–60.

Mann, E. M. and Toles, T (2018) *The Madhouse Effect*. Columbia University Press: New York

Mazid, A., Tutwiler, R., Al-Ahmed, H., Martini, M., Maya, F., 2003. Impact of modern agricultural technologies on durum wheat production in Syria. *INRM Technical Research Report Series* No. 3. ICARDA: Aleppo, Syria.

Menga, F and Swyngedouw, E (2018) States of Water in *Water, technology, and the nation-state*. Filippo Menga & E. (Erik) Swyngedouw (eds.). Abingdon, Oxon, United Kingdom: Routledge, pp.1-19.

Miller, S (2007) *Institutional Corruption: A study in Applied Philosophy*. Cambridge University Press: Cambridge

Mohan, M and Adarsh, S (2023) Dynamic flood frequency analysis for west flowing river of Kerala, India. *Water Security* 19(1) pp.1-9
<https://doi.org/10.1016/j.wasec.2023.100137>

Morag, N. (2001). Water, Geopolitics and State Building: The Case of Israel. *Middle Eastern Studies*, 37(3), pp.179–198. <http://www.jstor.org/stable/4284179>

Mourad, K. and Berndtsson, R (2014) Syrian Water Resources between the Present and the Future in *Air, Soil, and Water Reseach* 4(1) pp. 93-100 < doi: 10.4137/ASWR.S8076 >

Murphy, E. C (1994) The Arab-Israeli Conflict and the New World Order in *The Middle East in the New World Order* ed by Haifaa A Jawad. Macmillan Press: London.

NAPC (2003) *The state of food and agriculture in the Syrian Arab Republic 2002*. FAO Project GCP/SYR/006/ITA. Ministry of Agriculture and Agrarian Reform: Damascus, Syria <http://www.napcsyr.gov.sy/dwnld-files/periodical_reports/en/sofas_2002_en.pdf>

Naz, A. and Akhtar, A. . (2022) Revisiting South Asian Security Saga: A Nexus of Subaltern Realism and Human Security for Peace in 21st century. *Pakistan Journal of Social Sciences*, 39(2), pp. 665-673.
<<http://pjss.bzu.edu.pk/index.php/pjss/article/view/691> >

Niblock, T (1994) A framework for Renewal in the Middle East? in *The Middle East in the New World Order* ed by Haifaa A Jawad. Macmillan Press: London.

NPR (2013) *How Could a Drought Spark a Civil War?* Available at:
<https://www.npr.org/2013/09/08/220438728/how-could-a-drought-spark-a-civil-war>
[Accessed 24th July 2023].

OHCHR (N.D) Privatization and the Human Rights to Water and Sanitation.
www.ohchr.org/sites/default/files/Documents/Issues/Water/10anniversary/Privatization_EN.pdf [Accessed 27th May 2023].

Okafor, J (2022) *Environment Impact of Cotton from Growing, Farming and Consuming* Available at: <https://www.trvst.world/sustainable-living/fashion/environmental-impact-of-cotton/#:~:text=Cotton%20is%20water-intensive%20as%20a%20crop%20and%20in,5%20trillion%20liters%20of%20water%20every%20year%20worldwide>. [Accessed 12th July 2023].

- Olesker, R. (2014). National identity and securitization in Israel. *Ethnicities*, 14(3), pp.371–391. <https://doi.org/10.1177/1468796813504093>.
- OurWorldinData (N.D) *Death rate from unsafe water sources, 1990-2019*. Available at: [Death rate from unsafe water sources, 1990 to 2019 \(ourworldindata.org\)](https://ourworldindata.org/death-rate-from-unsafe-water-sources) [Accessed 27th July].
- OurWorldinData (N.D) *Number of people with access to at least basic drinking water, 2000-2015*. Available at: [Number of people with access to at least basic drinking water, 2000 to 2015 \(ourworldindata.org\)](https://ourworldindata.org/number-of-people-with-access-to-at-least-basic-drinking-water) [Accessed 27th July 2023]
- OurWorldinData (N.D) *Share of the population without access to an improved water source, 2000 – 2015.*] Available at: [Share of the population without access to an improved water source \(ourworldindata.org\)](https://ourworldindata.org/share-of-the-population-without-access-to-an-improved-water-source) [Accessed 27th July 2023]
- Perrier, E.R., Salkini, A.B. (1991). Soil Water Measurement. In: Perrier, E.R., Salkini, A.B., Ward, C.F. (eds) *Supplemental Irrigation in the Near East and North Africa*. Springer, Dordrecht, pp.123-131 https://doi.org/10.1007/978-94-011-3766-9_8
- Perthes, V. (1992). The Syrian Economy in the 1980s. *Middle East Journal*, 46(1), pp.37–58. <http://www.jstor.org/stable/4328392>
- Perthes, V. (2000) State Building, National Security and War Preparation in Syria. *War, Institutions, and Social Change in the Middle East* ed by Heydemann, S. University of California Press, Berkeley, pp.149—173.
- Pradhan, A and Srinivasan, V. (2022) Do dams improve water security in India? A review of post facto assessment. *Water Security* 15(1) <https://doi.org/10.1016/j.wasec.2022.100112>.
- Przeworski, A. & Limongi, F. (1997) Modernization: Theories and Facts. *World politics*. 49 (2), pp.155–183. < DOI: 10.1353/wp.1997.0004 >

Quilliam, N (2015) *Syria: The Rise of the Assads* Available at:

<https://www.bbc.co.uk/news/world-middle-east-34709235> [Accessed 25th July 2023]

Remini, B.; Kechard, R.; Achour, B. (2014). THE COLLECTING OF GROUNDWATER BY THE QANATS: A MILLENNIUM TECHNIQUE DECAYING. *Larhyss Journal* 20(1) pp.259–277.

Rey, M (2020) Drawing a line in the sand? Another (Hi)Story of borders. *Syria: Borders, Boundaries, and the State* ed. By Cimino, M. Cham: Springer International Publishing, pp. 27-46 <https://link-springer-com.ezproxy-s1.stir.ac.uk/book/10.1007/978-3-030-44877-6>

Reynolds, M. P., Pietragalla, J. and Braun, H. (2008) *International Symposium on Wheat Yield Potential: Challenges to International Wheat Breeding*. Mexico, CIMMY

Roberts, C. (1996) *The Logic of Historical Explanation*. University Park: Pennsylvania State University Press.

Rosengrant, M.V. (1997) *Water Raising Resources in the Twenty First Century: Challenges and Implications for Action*; IFPRI: Washington, DC, USA,

Roth, A. I. (2009) Reassurance: A Strategic Basis of U.S. Support for Israel. *International studies perspectives*. 10 (4) pp.378–393.

Sadowski, Y. M. (1985). Cadres, Guns, and Money: The Eighth Regional Congress of the Syrian Ba’th. *MERIP Reports*, 134(1) pp. 3–8. <https://doi.org/10.2307/3011746>

Said, E. (2018) Orientalism: Introduction. *The Norton Anthology of Theory and Criticism*. 3rd ed. Ed. by Vincent B. Leitch. United States of America: Norton Company. pp.1783-1805.

- Sandford, R (2017) *The Human Face of Water Insecurity: Water Security and Insecurity in The Human Face of Water Security*. ed by David. Devlaeminck et al. Cham: Springer International Publishing, p. 1-24.
- Schild, V (2015), Feminism and Neoliberalism in Latin America. *New Left Review*. 96 (1) pp.59-74 < <https://newleftreview.org/issues/ii96/articles/veronica-schild-feminism-and-neoliberalism-in-latin-america>>.
- Scott, J, (1998) *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Yale University Press: London
- Selby, J. (2020) On Blaming Climate Change for the Syrian Civil War. *Middle East Report*, 296. Available at <https://bit.ly/3JiuIzR> [Accessed 18th April 2023].
- Seth, S. (2011) Post-colonial Theory and the Critique of International Relations. *Millennium: Journal of International Studies* 40 (1) pp.167-183.
- Shojai, S and Katz, B (1992) *The Oil Market in the 1980s: a decade of decline*. Praeger publishers, New York.
- Siegel, S. M. (2017). *Let There Be Water: Israel's Solutions for a Water-Starved World*. New York St Martin's Press.
- Silva, G. S., and Ferabolli, S. R. (2021) On Alawization in Syria. *Journal of the Global South*, 12(60), pp.163-176 DOI: <https://doi.org/10.22456/2178-8839.113987>
- Smith, D and Krampe, F (2019) Climate-related security risks in the Middle East in *Routledge Handbook on Middle East Security* ed. by Jagerskog, A et al. Oxon, Routledge, pp. 199-208.
- Sneddon, C (2013) Water, Governance and Hegemony. *Contemporary Water Governance in the Global South: Scarcity, Marketization and Participation* ed, by Harris, L, Goldin, J, and Sneddon, C. Taylor & Francis Group, London, pp.31-43.

- Soifer, H (2008) State Infrastructural Power: Approaches to Conceptualization and Measurement. *St Comp Int Dev* 43(231), pp.231-251 < DOI 10.1007/s12116-008-9028-6>
- Sottimano, A (2015) Nationalism and Reform under Bashar al-Asad: Reading the “Legitimacy” of the Syrian Regime in *Syria from Reform to Revolt, Volume 1: Political economy and International Relations*. Ed by Raymond Hinnebusch and Tina Zint. New York: Syracuse University Press, pp.66-88.
- Sowers, J (2020) The Water-energy Nexus in the Middle East: Infrastructure, Development, and conflict. *WIREs Water* 7(4) < <https://doi.org/10.1002/wat2.1437>>
- Sullivan, C. J. (2018) Sidestepping A Quagmire: Russia, Syria, And the Lessons Of The Soviet-Afghan War. *Asian affairs* 49 (1), pp. 48–55.
- Tal, A. (2006) Seeking Sustainability: Israel’s Evolving Water Management Strategy. *Science (American Association for the Advancement of Science)*. 313 (5790) pp. 1081–1084.
- The Guardian (2023) *Bashar al-Assad tells Arab League he hopes his return marks a new era of peace* Available at: <https://www.theguardian.com/world/2023/may/19/syria-bashar-al-assad-receives-warm-welcome-on-arab-league-return> [Accessed 26th May 2023]
- The New York Times (1976) *Five Years of Progress Following the Corrective Movement*. Available at: <https://www.nytimes.com/1976/01/25/archives/five-years-of-progress-following-the-corrective-movement.html> [Accessed 18th July 2023].
- TheGlobalEconomy (N.D) *Syria: Government spending, percent of GDP*. Available at: https://www.theglobaleconomy.com/Syria/Government_size/ [Accessed 21st July 2023]

- Thompson, E. (2000) *The Climax and Crisis of the Colonial Welfare State in Syria and Lebanon during World War II. War Institutions, and Social Change in the Middle East* ed. by Heydemann, S. University of California Press, Berkley, pp.59-99.
- Triebert, C. (2015). Syria's bombed water infrastructure: An OSINT inquiry. Available at: <https://www.bellingcat.com/news/mena/2015/12/11/syrias-bombed-water-infrastructure/> [Accessed 4th August 2023].
- UN (1966) *Progress in Land Reform: 4th Report / Prepared jointly by the secretariats of the United Nations, the Food and Agriculture Organization of the United Nations and the International Labour Organization*. Available at: <https://digitallibrary.un.org/record/3823112> [Accessed 10th July 2023]
- UN News (2023), *Syria*. Available: <https://news.un.org/en/focus/syria> [Accessed 10 February 2023].
- UNESCO (2008) *World Population Prospects: 2008 Revision, United Nations Economic and Social Committee for Western Asia*.
- UNESCO (2016) *World Water Development Report – Water and Jobs*. Available at: <https://www.unesco.org/en/wwap/wwdr/2016> [Accessed 1st August 2023]
- UNESCO (2017) *World Water Development Report – Wastewater, the Untapped Resource* Available at: <https://www.unesco.org/en/wwap/wwdr/2017> [Accessed 1st August 2023].
- UNESCO (2020) *World Water Development Report – Water and Climate Change* Available at: <https://www.unesco.org/en/wwap/wwdr/2020> [Accessed 1st August 2023]
- UN-ESCWA and BGR (2013) *Inventory of Shared Water Resources in Western Asia*. Available at:

<https://waterinventory.org/sites/waterinventory.org/files/chapters/Chapter-24-Jezira-Tertiary-Limestone-Aquifer-System-web.pdf> [Accessed 21st July 2023].

UNICEF (2015) *Water Under Fire Volume 3*. Available at://www.unicef.org/reports/water-under-fire-volume-3 [Accessed 21st May 2023].

UNOCHA (2009) *Syria Drought Response Plan* Available at:

https://www.unocha.org/sites/dms/CAP/2010_Syria_DroughtResponsePlan_SCREEN.pdf [Accessed 20th July 2023].

Ventura, L. (2018) ‘Thank God We Are in Syria!’ Modernization, Interfaith Relations and Women’s Rights in Syria Before the ‘Arab Spring’ (2000-2010). *Islam & Christian Muslim relations*. 29 (3), pp.349–369. DOI: 10.1080/09596410.2018.1464730

Vitalis, R., and Heydemann, S. (2000) War, Keynesianism, and Colonialism: Explaining State-market Relations in the Post-war Middle East. *War Institutions, and Social Change in the Middle East* ed. by Heydemann, S. University of California Press, Berkley, pp.100-146.

Vohland, K.; Barry, B. (2009) A Review of *in situ* Rainwater Harvesting (RWH) Practices Modifying Landscape Functions in African Drylands. *Agr. Ecosyst. Environ.* 131, pp. 119–12.

Wākīm, J. (2013) *The Struggle of Major Powers Over Syria*. 1st ed. Reading, England: Ithaca Press.

Wang, X., Müller, C., Elliot, J. et al (2021) Global irrigation contribution to wheat and maize yield. *Nat Commun* 12.1235 <https://doi.org/10.1038/s41467-021-21498>

Wegren, S and Elvestad, C (2018) Russia’s food self-sufficiency and food security: an assessment. *Post-Communist Economies*, 30(5), pp. 565-587, DOI: [10.1080/14631377.2018.1470854](https://doi.org/10.1080/14631377.2018.1470854)#

Wessels, J and Hoogeveen, R.J.A, (2003) *Renovation of Qanats in Syria*. United Kingdom, pp.1-25 <https://inweh.unu.edu/wp-content/uploads/2021/03/Restoration-of-Qanats-in-Syria.pdf>.

Wessels, J. I. (2008). *To cooperate or not to cooperate...? collective action for rehabilitation of traditional water tunnel systems (qanats) in Syria*. Amsterdam: Vossiuspers, pp.1-381.

Woertz, E. (2020) Wither the self-sufficiency illusion? Food security in Arab Gulf States and the impact of COVID-19. *Food Sec.* 12(1) pp.757–760
<https://doi.org/10.1007/s12571-020-01081-4>

World Bank (2001) *Syrian Arab Republic Irrigation Sector Report*. Available at:
<https://documents1.worldbank.org/curated/en/248751468777620327/pdf/multi0page.pdf>

World Bank (2018) *Water Management in Fragile Systems: Building Resilience to Shocks and Protracted Crisis in the Middle East and North Africa*. [Accessed 3rd March 2023] Available at: <http://hdl.handle.net/10986/30307>

World Bank (N.D) *Annual Freshwater Withdrawals, Total (% of internal resources) – Syrian Arab Republic* Available at:
<https://data.worldbank.org/indicator/ER.H2O.FWTL.ZS?end=2010&locations=SY&start=1975> [Accessed 1st July 2023].

World Bank (N.D) *Crop Production Index (2014-2016) – Syrian Arab Republic* Available at:
<https://data.worldbank.org/indicator/AG.PRD.CROP.XD?end=2000&locations=SY&start=1970&view=chart> . [Accessed 9th July 2023].

World Bank (N.D) *Level of Water Stress: Freshwater withdrawal as a proportion of available freshwater resources- Syrian Arab Republic*. Available at:

<https://data.worldbank.org/indicator/ER.H2O.FWST.ZS?end=2010&locations=SY&start=1975> [Accessed 18th July 2023]

World Bank (N.D) *Military Expenditure (% of GDP) – Syrian Arab Republic, Israel, Iraq, Egypt, Arab republic* Available at:

<https://data.worldbank.org/indicator/MS.MIL.XPND.GD.ZS?end=1979&locations=SY-IL-IQ-EG&start=1966&view=chart> [Accessed 18th July 2023]

World Bank, (N.D) *Military Expenditure (% of GDP) – Syrian Arab Republic*. Available at:

data.worldbank.org/indicator/MS.MIL.XPND.GD.ZS?end=1979&locations=SY&start=1966&view=chart. [Accessed 25th July 2023]

WorldAtlas (N.D) *What is a qanat, and where are they found?* Available at: [What Is A Qanat, And Where Are They Found? - WorldAtlas](#) [Accessed 3rd August 2023]

WorldWildLife (N.D) *Sustainable Agriculture: Cotton* Available at:

<https://www.worldwildlife.org/industries/cotton> [Accessed 12th July 2023]

Wu, F. (2010) How Neoliberal Is China's Reform? The Origins of Change during Transition.

Eurasian Geography and Economics, 51(5), pp. 619-631, DOI: [10.2747/1539-7216.51.5.619](https://doi.org/10.2747/1539-7216.51.5.619)

Young, T. (2020) *We Need to Talk About Africa: The harm we have done, and how we should help*. London: OneWorld Publications.

Zaveri, E., B. Lobell, D. (2019) The role of irrigation in changing wheat yields and heat

sensitivity in India. *Nat Commun* 10(1) pp. 1-7. <https://doi.org/10.1038/s41467-019-12183-9>

- Zawahri, N (2019) The Multidimensional aspect of water security in the middle east and north Africa in *Routledge Handbook on Middle East Security* ed. by Jagerskog, A et al. Oxon, Routledge, pp.168-179.
- Ziabari, K (2022) How Iran's Dam-building obsession is killing Middle East's Largest Lake. *TRTWORLD*. Available: <https://www.trtworld.com/magazine/how-iran-s-dam-building-obsession-is-killing-middle-east-s-largest-lake-59266> [Accessed 18th April 2023].
- Zisser, E (2022) Rethinking Syrian nationalism: national identity and state in Syria, from the 'struggle for Syria' to the Syrian civil war. *Middle Eastern Studies*, 58(3), pp.421-434, DOI: 10.1080/00263206.2022.2047657
- Ghose, B (2014) Food security and food self-sufficiency in China: from past to 2050. *Food and Energy security* 3(2) pp.86-95.
- Baer-Nawrocka, A. and Sadowski, A. (2019) Food Security and food self-sufficiency around the world: A typology of countries. *PLoS ONE* 14(3) pp.1-15 <<https://doi.org/10.1371/journal.pone.0213448>>