

Water and the Capitalist Resource Frontier

If the intensive re-engineering of nature and society is one of the defining features of capitalist social relations, then equally so, and no less importantly, is the extensive ‘opening up’, colonisation and exploitation of new frontiers. How else could it be otherwise? Whether led by states, corporations or bands of pioneering men and women, the incorporation and ‘development’ of hitherto untapped or under-utilised regions and their resources is one of the surest routes to the accumulation of capital and the extension of social power. Capitalism’s central ideological tenets – its faiths in linear development via individual action, freedom and opportunity – likewise find no surer confirmation than in the progressive transformation of supposedly unused wilderness into productive land and property. Little wonder that Frederick Jackson Turner, high priest of the American frontier, could characterise it both as ‘the meeting point between savagery and civilization’ and as the source of America’s most abiding, and singularly capitalist, qualities: dynamism, materialism, individualism and democracy. As Jason Moore has put it, ‘capitalism’ is in essence ‘a frontier process’ in which ‘endless accumulation and endless geographical appropriation are joined at the hip’.¹

While this seems clear in general terms, one thing that is much less certain is the place of water within these processes. Indeed, water barely figures within frontiers research. Turner’s focus was the wildwood, reflecting the environmental challenges posed by the settlement of his native Wisconsin (American democracy ‘came out of the American forest’, he famously declared); as Donald Worster observes, the Turner thesis contains ‘no water’, and ‘no aridity’, as well as ‘no technological dominance’ and ‘very little in it of the West as it is geographically defined

¹ F. J. Turner, *The Frontier in American History* (Holt, Reinhart and Winston, 1920), 3, 37; J. W. Moore, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital* (Verso, 2015), 107.

today'. Moreover, this neglect of what we might call 'water frontiers' has continued to this day. The recent literature on new 'resource frontiers' contains next to nothing on the exploitation or appropriation of water specifically. There have been countless studies of the opening up of agricultural land through deforestation, but very little on the frontier dynamics within desert or dryland margins. And one searches in vain through the pages of recent hydro-politics research for analyses of frontier water conflicts. Explicit adoption of a frontier perspective on water conflict and insecurities is almost entirely absent.²

This chapter seeks to make good on these existing research gaps while simultaneously extending our analysis, begun in Chapter 5, of the political ecology of water development and state-building and their impacts on water-related conflicts and insecurities. The two chapters have quite different substantive foci: where the previous chapter concentrated on major water engineering projects and geographically core regions and populations, our attention here shifts to geographical peripheries and the profound socio-political conflicts that are typically found within them, and attends more to questions of land control than to large-scale hydraulics. Yet irrespective of these differences (which are in any case not absolute, but matters of degree) the two chapters' central arguments are essentially the same: that projects of state-building and development have repeatedly involved, or resulted in, large-scale environmental and social destruction, dispossession, violence and insecurity; that the water arena provides ample evidence to this effect; that water-related conflicts and insecurities are caused less by scarcity – among other things, because they often coincide with relative abundance – than by political and political-economic interests, structures and agendas; and notwithstanding all this, that patterns of water-related conflict and insecurity can take very different forms in different contexts, determined above all by core state-building and development agendas. If this is so of core regions, then it applies doubly, or more, at the frontier.

As we use it here, the term 'frontier' refers to spaces that are simultaneously geographically peripheral to existing centres of political and economic power and sites of outward expansion and incorporation by those existing centres – typically involving some combination of colonisation, commodification, extraction and appropriation. Understood thus,

² Turner, *Frontier*, 293; Worster, *Rivers of Empire*, 11; N. L. Peluso and P. Vandergeest, 'Political ecologies of war and forests: counterinsurgency and the making of national natures', *Annals of the Association of American Geographers*, 101:3 (2011), 587–608; M. B. Rasmussen and C. Lund, 'Reconfiguring frontier spaces: the territorialisation of resource control', *World Development*, 101 (2018), 388–99; Selby, 'Climate change and the Syrian civil war, part II'.

'frontier' is essentially a socio-political rather than environmental category; the location of frontiers changes across time ('the frontier is the outer edge of the wave', said Turner; it is 'a mobile front in continuous formation', say Mezzadra and Neilson) and is determined by political structures and developmental trajectories, not by the differential endowments of nature.³ For obvious reasons, however, there usually is an environmental dimension to frontiers, and to this extent they are perhaps better understood as socio-ecological spaces. In character, they are deeply contradictory. They are commonly imagined by their colonisers as open, empty, under-used and uncivilised. They typically combine, or are thought to combine, abundances of free land and other resources, together with scarcities of capital and labour. They are spaces of freedom, potential and opportunity, if also hardship, and the regular focus of myths of nation-building and development. But they are also sites of lawlessness, violence and expropriation. They are typically characterised by attenuated state authority and legitimacy, if also highly coercive practices of control. Their local and indigenous populations, who are usually viewed as obstacles to or at best objects of frontier development rather than as its subjects – especially if they happen to possess their own collective national or ethnic identities – are typically neglected, marginalised, excluded and sometimes expelled. Frontiers, as a result, are lands of both movement and confinement, of simultaneous in-migration, out-migration and displacement, and, at the extreme, include enclaves for those peoples expelled in the name of progress. In turn, frontiers are always spaces of resistance, resilience and local adaptation. And for all these reasons they are also always sites of rapid, thinly regulated and short-termist economic development, with all of its attendant social and ecological consequences.

In what follows we illustrate and explore these patterns and tendencies with reference to Sudan, Palestine, Syria and Lake Chad, showing in each case how 'water frontiers' – by which we simply mean frontier regions where the development, appropriation or control of water resources is an important objective, without meaning to imply that the dynamics found within such regions can be reduced to water-related interests alone – are sites of extreme appropriation, inequality, degradation, conflict and insecurity, both in general and in relation to water specifically. After considering these four cases we then turn the tables somewhat, to explore frontier political agency – the diverse means through which frontier actors endure and resist internal colonial state power vis-à-vis the environment. And we close, as in previous chapters, by turning to climate change,

³ Turner, *Frontier*, 3; S. Mezzadra and B. Neilson, *Border as Method, or, the Multiplication of Labor* (Duke University Press, 2013), 15.

noting that frontiers are widely misunderstood within climate crisis discourse and reflecting on the how they are actually likely to fare as the planet warms.

Abundance and Violence on Sudan's Multiple Frontiers

We have already seen in the previous chapter that Sudan has a particularly acute history of water-related dispossession and conflict that spans the colonial, post-colonial and contemporary eras. Swamp drainage, river canalisation, dam building, irrigation schemes, and more: all have had their victims, especially in the country's riverine core where the goals of hydraulic state-building and agricultural modernisation have been most consistently pursued. Yet for all this, the violence which has always stalked Sudan's core states pales into insignificance relative to that which has raged across the country's frontier regions since the 1980s, since when large-scale violence in Sudan has had a predominantly frontier character. And water, crucially, has been an important and recurring element in this.

For context, Sudan's first civil war of 1955–72 was confined to the south of the country and was essentially political in its causes, revolving around the under-representation of southern leaders and their demands for secession. By contrast, the second civil war of 1983–2005 and the 'network of internal wars' that Sudan has experienced since then have brought large-scale armed conflict to 'semi-peripheral' regions of the 'Muslim North' – to South Kordofan, Blue Nile, Kassala, Red Sea and, as already discussed in Chapter 3, Darfur – that is, to areas lying outside both the core riverine states around Khartoum and the equatorial zone to the south. The fundamental reason for this shift is that, since the 1980s, resource appropriation has become a primary motivation for and cause of conflict in Sudan, it being in the country's semi-peripheral regions that what David Harvey termed 'accumulation by dispossession' has been most marked. Within these regions, it is resource abundance – of land, oil, minerals, livestock and, yes, water – which has been the major correlate of conflict and source of vulnerability. Moreover, this new conflict geography has emerged in large part because of a specific post-1970 national development regime allied to Sudan's deepening integration into, and dependence on, the global economy. Right across the country's semi-periphery, new dynamics of capitalist development have underpinned the emergence of new conflict-ridden internal frontiers.⁴ Here we consider two outstanding examples of this: South Kordofan and, once again, Darfur.

⁴ D. H. Johnson, *The Root Causes of Sudan's Civil Wars* (James Currey, 2003), 63–87, 127, 130; Selby and Hoffmann, 'Beyond scarcity', 366–8; D. Harvey, 'The "new" imperialism:

The central Sudanese province of South Kordofan lies in the country's semi-arid Sahel zone, between the desert lands to the north and what is now South Sudan, just to the south. Centred on the Nuba Mountains which reach up to 1,300 metres above sea level, the province has few surface water resources beyond intermittent streams flowing east towards the Nile; yet it nonetheless receives relatively good summer rains – its lowland capital, Kadugli, has annual average precipitation of 700 mm – and its clay plains are suitable for both grazing and cultivation. Until the 1970s, the region had an essentially subsistence agricultural and livestock economy and a communal and customary land regime. The region was not without history, of course. Its Nuba peoples, in particular, had repeatedly been objects of coercive outside interventions, from slave-raiding under the Turkiyya and Mahdiyya periods through to forced resettlement by the British. However, the socio-economic changes within the region had been limited – and intentionally so. Under the British, the Nuba Mountains had been a 'closed district', with access, trade and external contact restricted in a bid to preserve tribal identity, and following independence this pattern was initially maintained.⁵ Only from the 1970s was it upended: henceforth, a region that had long been an ethnic and ecological intermediate zone became in addition an open, dynamic, capitalist frontier.

The initial catalysts to this change were a series of World Bank-funded Mechanised Farming Projects that sought, as the Bank put it, to 'open up' supposedly uncultivated and 'almost uninhabited' land for sorghum and sesame production. The projects involved the creation of standard 630-hectare farm plots, land clearance, provision of credit for tractors and tractor-drawn equipment, new roads and the establishment of a government-owned Mechanised Farming Corporation (MFC) that would henceforth own and lease the new land and oversee the whole process. Mechanisation, here, was thought to offer the key to land use change, enabling the systematic development of clay soils that were too heavy for cultivation with simple hand tools, especially when wet. In turn, both the Bank and the Sudanese government advocated the development of rain-fed mechanised farming right across Sudan's transitional zone, with this ambition becoming central to the Nimeiri administration's Breadbasket Strategy. Mechanised rain-fed cultivation for export became a national priority. Gulf capital flowed in, in support. And Sudan's land

accumulation by dispossession', *Socialist Register*, 40 (2009), 63–87; A. J. Ayers, 'Sudan's uncivil war: the global-historical constitution of political violence', *Review of African Political Economy*, 37:124 (2010), 153–71.

⁵ H. A. Kadouf, 'Marginalization and resistance: the plight of the Nuba People', *New Political Science*, 23:1 (2001), 45–63; G. K. Komey, *Land, Governance, Conflict and the Nuba of Sudan* (James Currey, 2010), 36–43.

regime was simultaneously transformed, the government's 1970 Unregistered Land Act abolishing customary land rights and converting nearly all unregistered – that is, communal and tribal – land into government property.⁶ Here, external liberalisation – *infitah* – went hand in glove with the internal 'opening up' of new frontier land for development.

Between the late 1970s and mid-1980s, as a result, the area under mechanised cultivation in Sudan's central clay plains more than doubled, to over 3.7 million hectares; in the Nuba Mountains alone, nearly 1,400 mechanised farming schemes were established during this period. There was some diversification of Sudan's agricultural exports with sorghum, in particular, becoming the country's second largest export crop after cotton. Yet overall, the consequences of this expansion drive were dismal, as discussed in the previous chapter. And the problems were particularly acute in producer regions. In South Kordofan – one of the main targets of the MFC programme, possessing, by 1986, a quarter of the country's total mechanised agricultural land – mechanisation brought a potent combination of elite enrichment, local dispossession, ecological degradation and tribal conflict. Most of the newly opened land was leased or sold by the MFC to government officials, former military officers and wealthy riverine merchants (often at bargain prices and with the additional benefit of low-interest government loans, subsidised farm equipment, fuel quotas and trade licences); for example, in the largest scheme in the Nuba Mountains, in the Habila area, only 12 of 143 farms were allocated to local co-operatives, with the rest going to absentee merchants and government officials. Furthermore, since this land was far from unused or uninhabited, these development schemes necessarily involved appropriation, livelihood destruction and displacement, especially of Nuba communities. Farmers were driven from their lands without compensation, and transhumance routes were blocked. Large areas of land were seized outside of designated sites. People were frequently fined or imprisoned for 'trespassing' on land held by mechanised schemes. And grain harvests were burned in protest. The combination of widespread bush clearance, crop monoculture and continuous cropping also led to soil exhaustion and erosion, and declining crop yields. Thus followed typical frontier cycles of land development and abandonment, and repeated waves of

⁶ World Bank, *Mechanised Farming Project: Sudan, Appraisal Report* (1968), i, 5; World Bank, *Development Credit Agreement (Second Mechanized Farming Project) between the Democratic Republic of the Sudan and International Development Association* (1972), 16; World Bank, *Project Performance Audit Report: Sudan Second Mechanized Farming Project* (1982), 1; G. Kibreab, 'Property rights, development policy and depletion of resources: the case of the central rainlands of Sudan, 1940s–1980s', *Environment and History*, 7:1 (2001), 57–108.

dispossession and displacement. As the Nuba Mountains Farmers Union observed in 1974, 'there is glaring inequality and injustice in all schemes . . . the discrimination is basically against the local people of the Nuba Mountains, and favors certain people from other areas'.⁷

Sudan's second civil war broke out in 1983 and by 1985 the Nuba Mountains had become one of its key battlegrounds, with many Nuba joining the SPLM/A. This conflict geography was no accident: the Nuba had long been subject to racial oppression, the Sudanese state under al-Nimeiri had become committed to Islamisation and this combined with large-scale land appropriation and displacement made many deeply hostile to Khartoum. Moreover, land appropriation was not just one factor among others: in the assessment of Sudanese academic Mohamed Suliman, the encroachment of mechanised agriculture was '[t]he single most important issue behind the outbreak of the conflict in the Nuba Mountains . . . This devastated the economic and social life of the Nuba and ultimately destroyed friendly relations with the Baggara'.⁸

For their part, between 1985 and 1993 Sudanese government forces and local Baggara militias conducted a brutal counter-insurgency war in the region. At least 100,000 Nuba, and possibly more than 200,000, were killed or disappeared, while a swathe of 'peace camps' were simultaneously established in fulfilment of the government's project of Islamising the region; by 1992, an estimated 167,000 Nuba had been relocated to them. Far from being simple educational facilities, these camps, as described by the NGO African Rights, were

concentration camps in the true sense of the word Inmates are kept there against their will, they are forced to work for low wages or no wages, men are forced to become members of the PDF [Popular Defence Forces], women are raped, and children have their identities changed. It is all part of a programme for dismembering Nuba society . . . every woman who has been in a peace camp has either been raped or threatened with rape.

⁷ Suliman, 'Civil war', 105; A. M. Yahya and B. A. Mohammed, *The Future of Mechanized Schemes and Agricultural Investment in the South Kordofan State/Nuba Mountains* (Chr. Michelsen Institute, 2016), 10; African Rights, *Facing Genocide: The Nuba of Sudan* (1995), 40–1; G. K. Komey, 'Land factor in wars and conflicts in Africa: the case of the Nuba struggle in Sudan', in T. Falola and R. C. Njoku (eds.), *War and Peace in Africa* (Carolina Academic Press, 2010), 364–5; Komey, *Land, Governance, Conflict*, 43–9; Johnson, *Root Causes*, 132; H. B. Ibrahim, *Agricultural Development Policy, Ethnicity and Socio-Political Change in the Nuba Mountains, Sudan* (PhD thesis, University of Connecticut, 1988), 114–15.

⁸ M. Suliman, 'The Nuba Mountains of Sudan: resource access, violent conflict', in D. Buckles (ed.), *Cultivating Peace: Conflict and Collaboration in Natural Resource Management* (International Development Research Centre and World Bank, 1999), 212.

Resettlement to these camps also enabled further land appropriation while providing a captive labour pool for farms, with some camps being directly attached and adjacent to farming schemes. In South Kordofan, during the three decades from 1970, agricultural development both paved the way for and was further facilitated by state-led appropriation and genocidal dispossession.⁹

Like South Kordofan, the western Sudanese region of Darfur has been a site of acute state-orchestrated and inter-ethnic violence since the 1980s. Indeed, we have already explored one reading of this violence, showing in Chapter 3 that the region's 2003–5 war should not be understood through a 'climate conflict' lens. But how, then, should it be understood? If climate conflict narratives of the war are flawed, does this mean that it was 'purely political' in its causes? Or in what sense, if at all, was this war a product of capitalist development 'at the frontier'?

The key to answering these questions lies in recognising that, within Darfur itself, the war centred above all on issues to do with land – and in understanding the economic and political reasons for this. That land issues were central to Darfur's slide into war has been extensively documented in both academic studies and humanitarian and conflict reporting on the subject. In the years prior to the war, there was a continuous increase in the number and intensity of local disputes over land, many of them violent. The capture and possession of land – and the dispossession and displacement of others from land they considered theirs – became one of the war's recurring motifs. The political discourse of local parties reflected this, whether in the form of justifications of violence ('we have no land!') or resistance against it ('they came to steal our land!'). Land issues have been central to subsequent attempts to craft a durable political settlement within Darfur, as well as an obstacle to its realisation. And land continues to be a major source of discord, as evidenced by the refusal of most displaced Darfuris to accept resettlement beyond internally displaced person (IDP) camps.¹⁰ Moreover, and crucially, the fundamental reason why land conflicts have erupted with such

⁹ M. Burr, Working Document II: Quantifying Genocide in Southern Sudan and the Nuba Mountains 1983–1998 (US Committee for Refugees, 1998), 33; African Rights, *Facing Genocide*, 3, 120–8, 267–75; Komey, *Land, Governance, Conflict*, 77–99; L. Wise, 'The genocide–ecocide nexus in Sudan: violent "development" and the racial-spatial dynamics of (neo)colonial-capitalist extraction', *Journal of Genocide Research*, 23:2 (2021), 201.

¹⁰ M. A. Abdul-Jalil, 'Nomad-sedentary relations and the question of land rights in Darfur: from complementarity to conflict', in R. Rottenburg (ed.), *Nomadic-Sedentary Relations and Failing State Institutions in Darfur and Kordofan* (Martin-Luther-Universität Halle-Wittenberg, 2008), 14–15; J. Flint, *The Other War: Inter-Arab Conflict in Darfur* (Small Arms Survey, 2010), 12–16; J. Tubiana, 'Le Darfour'; Abdul-Jalil and Unruh, 'Land rights'; Darfur Peace Agreement (2006), 22, 29, 31; 'Displaced "reject Central Darfur model villages": sheikh', *Radio Dabanga* (04/07/2013).

force in Darfur is not drought but because, together with South Kordofan, the region has become a developmental frontier par excellence.

In one sense, Darfur has always been a frontier region, defined above all by its central Jebel Marra mountain range which rises to over 3,000 metres above sea level, the highest point in Sudan. At its core this highland area has a temperate climate and heavy seasonal rains, which in turn feed permanent and seasonal streams as well as groundwater resources that radiate outwards across the region. In these respects Darfur is unique within Sudan, centring on a relatively water-rich and fertile finger of land that juts out into the northern Sahel and the Sahara, far beyond other areas of the country. Indeed, across the whole of the eastern Sahel – from Lake Chad 1,000 km to the west, to the River Nile 1,000 km to the east – Darfur is the only region where verdant green land and savannah woodland can be found so far north (as can be seen from even a quick scan of Google Earth). Darfur is not only a watershed region, dividing the Nile basin from the endorheic Lake Chad basin in the centre of the continent; metaphorically speaking, it is also very much a regional oasis in the desert.

Under British rule and the early post-independence years these environmental advantages were barely exploited, except locally – owing, as in the Nuba Mountains, to Native Administration policies and restrictions on development. While Darfur was integrated into the Sudanese and colonial economies, this was mainly as a labour reserve for the Gezira scheme and its cotton production and exports. But in the second half of the twentieth century this pattern of limited economic incorporation changed, with two main infrastructural developments setting the stage. In 1959, Sudan's southern rail line was extended to Nyala, creating the conditions for the emergence of a regional export crop economy. And this was followed, from the 1960s, by the introduction and uptake of diesel-powered tubewells, which for the first time enabled systematic exploitation of Darfur's shallow but plentiful groundwater resources. The latter development, in particular, transformed the geography, intensity and overall political economy of agricultural production within Darfur. Newfound access to groundwater meant that, where cultivation had previously been largely confined to valley terraces, it now also became possible in the light *goz* soils of the open savannah – using a simple borehole, pump fuel and oil drums for overland distribution. Year-round access to constant underground stocks of water also made multi-season cropping possible, in turn revolutionising production processes.

Indicative of this, a 1988 survey found that low water availability was viewed by farmers as only the fifth biggest obstacle to irrigation expansion, with fuel and cash, the latter to buy fuel and hire labour, being much bigger constraints (and this was despite the fact that the survey was conducted following a year of poor rains).¹¹ By the 1980s, if not earlier, Darfur's agricultural sector had become distinctly modern – dynamic, export-oriented and highly capital- and fuel-dependent – and nothing like the traditional system of Orientalist imagination.

In turn, these technological and economic changes upended established land use and associated demographic patterns, paving the way for the land conflicts and violence discussed above. Much of this has already been detailed in Chapter 3. Open rangelands, which had hitherto been used mainly for communal grazing, became prime sites for cash crop development and were progressively demarcated, enclosed, irrigated, cultivated and settled. The cash crop sector became the main source of economic opportunity and dynamism within Darfur's rural economy. Unlike in South Kordofan where, as we have seen, agricultural development was a state-led project, in Darfur's transition small-scale, private-farmer horticulture predominated. Pastoralist communities moved decisively into farming as a result, often migrating and settling new lands in the process. This, in turn, led to a rapid expansion in the population of South Darfur, where the opportunities for irrigated horticulture were greatest.¹² There was also eastward cross-border movement into Darfur, with the region as a whole witnessing significant in-migration. Combining relative resource abundance, economic opportunity, processes of enclosure and commodification, extensive in-migration and settlement, as well as decided limits to the rule of law, post-1960s Darfur bore many of the classic hallmarks of a capitalist frontier.

Although these transformative processes revolved mainly around the cash crop economy, in the decade prior to the 2003–5 war there had also been a significant expansion in Darfur's livestock sector. Historically, livestock had not figured heavily within Sudan's development thinking. But following the economic crisis of the 1980s and the failure of the Breadbasket Strategy, this sector became viewed as crucial to the goal of

¹¹ Mamdani, *Saviours and Survivors*, 163–75; A. Abdelkarim, *Primitive Capital Accumulation in the Sudan* (Frank Cass, 1992), 40–1; Morton, *Agricultural Development*, 34–5; Jebel Marra Rural Development Project, 'Irrigation Survey 1988 (Khartoum)', in Morton, *Agricultural Development*, 81.

¹² Morton, *Agricultural Development*, 35; M. Adams, 'The Baggara problem: attempts at modern change in southern Darfur and southern Kordofan (Sudan)', *Development and Change*, 13:2 (1982), 270.

increasing export earnings. Reflecting this, Sudan's Comprehensive National Strategy of 1992 aimed to triple the size of the country's livestock population and increase exports twentyfold within the space of just ten years, via a systematic modernisation of feeding and ranching processes. To this end, the sector was comprehensively liberalised, starting with the replacement of the parastatal Livestock and Meat Marketing Corporation with commercial livestock banks. The consequences were dramatic. Livestock's contribution to Sudan's agricultural exports rose from just 6–7 per cent in the 1960s and early 1970s, to an average 27 per cent by the turn of the millennium. Sudan became the leading livestock exporter in the region, with most of its animals, above all sheep, being exported live to Saudi Arabia. Livestock became Sudan's third most important export commodity, after oil and gold; and the livestock sector became the biggest in Sudan's domestic economy, bigger even than oil. Moreover, Darfur was at the heart of this expansion, accounting for as much of a third of the country's total livestock production. Large-scale ranches were established, owned by wealthy urban elites and government officials (in South Darfur, for example, several private investors owned ranches of over 20,000 hectares).¹³ As in farming so also in livestock: in both sectors the commercialisation, globalisation and liberalisation of Sudan's economy resulted, on the ground, in the progressive privatisation and appropriation of land.

But how did these developments feed into the 2003–5 war? Most climate conflict accounts of these processes simply assume, where they acknowledge them at all, that the expansion of cultivation and especially livestock numbers in Darfur led to increased competition over scarce and increasingly degraded land and water resources, which in turn resulted in violence between 'farmers' and 'herders'. Yet such tacit Malthusianism has little to commend it – partly for the theoretical reasons set out in Chapter 2; partly because of the evidence of greening and in-migration discussed in Chapter 3; and, perhaps most fundamentally, because narratives of Darfur as a scarce and degraded environment are as old as British colonial rule in the region, yet fly in the face of the huge recent expansions in its cash crop and livestock sectors. Instead, the intensifying conflict over land in the run-up to the 2003–5 war seems to have had three major structural causes. First, the developmental processes outlined above upended established divisions and hierarchies – between tribes,

¹³ H. M. Nur, 'Ambitious plans and unresponsive sectors: new horizons for pastoral development in Sudan', *Nomadic Peoples*, 5:1 (2001), 134–54; M. Buchanan-Smith, et al., *On the Hoof: Livestock Trade in Darfur* (Tufts University and UNEP, 2012), 10, 19, 52; R. Behnke, *The Economics of Pastoral Livestock Production in Sudan* (Feinstein International Center, Tufts University, 2012), 2–3; Young et al., *Darfur*, 67–9.

between farmers and pastoralists, and between northern and southern Darfur – creating incentives for pastoralist groups, in particular, to migrate, seize land and through that assert or reassert their place within Darfur’s social order (hence the reason why some of those who migrated, like the Zaghawa, were relatively wealthy, whereas others, like the Northern Rizeigat, had historically been *dar*-less and economically marginalised). Second, the above political and economic changes coincided with, and were in part facilitated by, no less acute transformations in local governance and authority structures following the dissolution of Sudan’s Native Administration system in 1971; it was this combination of profound economic and political change and frontier lawlessness that enabled contestation over land to descend into mass violence. And third, there undoubtedly were a growing number of conflicts over access to *wadis*, water-rich land and transhumance routes in the years prior to the 2003–5 war. Crucially, however, these conflicts were not the result of a generalised condition of scarcity, but rather of frontier-style grabbing of land and water resources.¹⁴

In the late twentieth century, then, both Darfur and South Kordofan were water frontiers in the fullest of senses. In both cases, abundant, low-value land suddenly became a valuable resource and an object of competition and conflict. In both cases, the primary latent property of this land, which underpinned it becoming so valuable, was the relative richness of its water resources. In both cases, this land and its waters suddenly became valuable not out of scarcity but for reasons of political economy, especially technological diffusion and export-oriented national economic policies. In both cases, these profound political–economic changes sparked the widespread appropriation and enclosure of land and water; equally widespread dispossession and displacement; and extreme violence, both between local actors but also with and by the Sudanese state. It would be a mistake, no doubt, to describe the conflicts in South Kordofan and Darfur as ‘water conflicts’, not least because of their essentially political and political–economic causes. But as elsewhere on Sudan’s semi-periphery, water – or more precisely water-rich land – was the primary target and objective of local development. And it was these regions’ emergence as water resource frontiers which set the stage for the extreme violence that followed.

¹⁴ Morton, *Agricultural Development*, 9, 30–2, 90, 96–7; de Waal, ‘Is climate change the culprit?’; Mamdani, *Saviors and Survivors*, 235–40; Abdul-Jalil and Unruh, ‘Land rights’, 162–5, 169–71; UNEP, *Sudan*, 81–2.

Water Apartheid in the West Bank and Gaza

The West Bank and Gaza Strip present us with what is, in many respects, a polar opposite case. For, whereas on Sudan's semi-periphery it was the introduction of new technologies and economic liberalisation that paved the way for land appropriation and war, in the West Bank and Gaza what occurred was the reverse, with war opening up a new era of, and space for, state-led frontier colonisation. The war in question was the Six Day War of June 1967, by the end of which Israel had become the occupying military power across the West Bank and Gaza (plus in the Golan Heights and Sinai peninsula, which are not considered here). East Jerusalem was immediately annexed, while large swathes of land in both the West Bank and Gaza were redefined as state property and earmarked for Jewish settlement, with settlements being established first in the Jordan Valley and around Jerusalem, and then, after 1981, on a much larger scale across the Occupied Palestinian Territories. Simultaneously, Israel established a dual legal and institutional system, under which Palestinians were governed by a complex matrix of Military Orders, military courts and state violence, and were denied both citizenship and access to public funds, while settlers continued to exercise those political, social and economic rights available to all other Jewish Israelis. Of course, the Israeli–Palestinian conflict had always had a frontier character, set in motion by a colonial project that viewed Palestine, in extreme, as a 'land without a people for a people without a land'. But post-1967 in the Occupied Territories this 'frontierity' became particularly acute, with a clearly apartheid-like form. By 1993, when the Oslo peace process began, there were 264,000 Israeli settlers in the West Bank (including East Jerusalem), plus 4,000 in Gaza, living there both in violation of international law and under a completely different legal and institutional regime from the Territories' estimated 2.5 million Palestinians.¹⁵

In another contrast with the situation in Sudan, hydro-political objectives were central neither to Israel's 1967 capture of the West Bank and Gaza, nor to their subsequent settlement. Not only was the Six Day War no 'water war', as discussed in Chapter 2; equally, Israel's settlement

¹⁵ Shafir and Peled, *Being Israeli*, ch. 6; E. Benvenisti, *Legal Dualism: The Absorption of the Occupied Territories into Israel* (Westview, 1990); D. Muir, 'A land without a people for a people without a land', *Middle East Quarterly*, 15:2 (2008), 55–62; B. Kimmerling, *Zionism and Territory: The Socio-Territorial Dimensions of Zionist Politics* (University of California Press, 1983); UN-ESCWA, *Israeli Practices towards the Palestinian People and the Question of Apartheid* (2017); B'Tselem, 'A regime of Jewish supremacy from the Jordan River to the Mediterranean Sea: this is apartheid' (12/01/2021); Foundation for Middle East Peace, 'Comprehensive settlement population 1972–2011' (2012); Palestinian CBS, 'Estimated population in Palestine mid-year by governorate, 1997–2021' (2005).

drive was motivated much more by ‘security concerns’ (especially establishing a security buffer in the Jordan Valley), by rising religious-nationalist sentiment and by interests in redirecting some of the country’s urban growth away from its congested coastal plain, than by anything to do with water (on the latter, consider the words of a 1993 Israeli government advertisement for housing in the Jordan Valley: ‘Free yourself from the hysteria that you wake up with every morning. Free yourself of the fear of walking alone in the street Free yourself in order to succeed with your wife who will once again smile as you return home All this one hour from the center of the country’). That said, Israel’s settlement project involved large-scale land appropriation and, as a corollary, the extensive capture of local water resources. Moreover, the occupation of the West Bank was of hydro-political advantage to Israel. A mostly upland region with relatively strong winter rains, the West Bank houses the replenishment zone for the trans-boundary Mountain Aquifer – a groundwater resource which, until Israel’s recent desalination investments, provided around a quarter of the country’s total water supplies. Israel was already heavily exploiting this Aquifer prior to 1967, via springs and wells below the West Bank. From 1967, however, Israel was also able to use its occupation of the West Bank to restrict and contain rising Palestinian water consumption there, and to ensure that it would remain the Mountain Aquifer’s principal user.¹⁶ Occupation, in short, not only opened the gates to local water appropriation; it also created an opportunity for Israel to consolidate an already unequal hydro-political status quo. (It is also worth noting here that, in the process, the West Bank was reimagined as a site of water resource abundance. Pre-1948 the West Bank was not thought of in this way, and hence was not a focus of early Zionist settlement. However, improvements in well technology changed all this, enabling ready access to the territory’s rich aquifers: as in South Kordofan and Darfur, technological development opened up a new water frontier).

Many of the consequences are well known. Across the West Bank, the hundreds of Israeli settlements which were established mostly had good, constant water supplies and per capita use well above even the Israeli average, settler swimming pools becoming a potent symbol of this colonial plenty. Settler water supplies were also heavily subsidised. Deep wells were drilled into the Mountain Aquifer to supply the settlements, and from 1981 Israel started integrating them into its national supply

¹⁶ *Ha’aretz* (22/04/1993), in Foundation for Middle East Peace, *Report on Israeli Settlement*, 3:5 (1993), 7; Lowi, *Water and Power*, 185; M. Zeitoun et al., ‘Asymmetric abstraction and allocation: the Israeli–Palestinian water pumping record’, *Groundwater*, 47:1 (2009), 146–60.

network. In the Jordan Valley, most Palestinian land along with the wells and springs on it was appropriated, in their place coming Israeli settlements with intensive irrigated agriculture and exceptionally high water usage. Elsewhere, Palestinian land and water was widely appropriated too, with the boundaries of settlements typically extending far beyond just their built-up areas. Indeed, to this day springs and wells are repeatedly claimed by armed groups of settlers, with Palestinians being usurped from them or finding access to them denied.¹⁷

At the same time, a highly restrictive control regime was established to limit West Bank Palestinian water development and demand. A 1968 Military Order declared all local water resources to be public property subject to state control, as within Israel itself. Ownership of all (Palestinian and Israeli settler) water supply systems was subsequently transferred to Israel's parastatal water company, Mekorot. Other Military Orders dictated that all new and existing water installations would require a permit from the Military Government (and, later, what was rebranded the Civil Administration) and that applications could be denied, revoked or amended 'without giving reasons'. Permits were, moreover, routinely denied. From 1967, in a sharp departure from the era of Jordan rule, not a single Palestinian permit was granted for the drilling of wells into the crucial Western Basin of the Mountain Aquifer, with Palestinian exploitation of this basin frozen at 1967 levels. Not one permit was granted for new agricultural wells, either. Irrigation was not permitted after 4 p.m. Meters were installed on existing wells, and abstraction quotas rigorously enforced. 'Illegal' (i.e. non-permitted) wells, pipelines and water storage facilities were, and still are, routinely destroyed by the Israeli military. Palestinians did not benefit from water subsidies either, paying far higher prices for their water supplies. Furthermore, while Palestinian communities did benefit from some Israeli investment in water infrastructure, this investment was decidedly double-edged. While new supply networks were laid, these did not only supply water; they also integrated Palestinian communities, alongside illegal settlements, into Israel's national water supply network. Moreover, far from supplying water equally between settler and Palestinian communities,

¹⁷ J. Isaac and J. Selby, 'The Palestinian water crisis: status, projections and potential for resolution', *Natural Resources Forum*, 20:1 (1996), 18–20; Selby, *Water, Power and Politics*, ch. 3; B'Tselem, *Dispossession and Exploitation: Israel's Policy in the Jordan Valley and Northern Dead Sea* (2011), 37; Bimkom, *The Prohibited Zone: Israeli Planning Policy in the Palestinian Villages in Area C* (Planners for Human Rights, 2008); Y. Berger, 'Israeli settlers "upgrade" West Bank springs to usurp Palestinian land', *Ha'aretz* (31/05/2019).

both the material structure of these networks – the size and design of pipes and reservoirs – and the regulations surrounding them worked to ensure that supplies were directed disproportionately, and more reliably, to the settlements. Configured as they were by a racist state project, these supply apparatuses were not merely technologies, but ‘techno-political’ instruments of colonisation, discrimination and enforced dependency.¹⁸

The consequence of all this was that, by the early 1990s, Palestinian communities across the West Bank were being plagued by chronic under-supply – while neither Jewish citizens in Israel nor West Bank settlements were experiencing anything equivalent. All Palestinian towns and mains-connected villages were in receipt of intermittent supplies only (with each area of a typical town receiving water for two to three days before having one to two weeks off). Many peripheral and hill-top communities would go several months each summer without piped supplies. Around half of all villages were also not connected. In addition, the West Bank had become increasingly dependent on water supplies from Israel. And overall, according to official Israeli figures, in 1995 Israelis were utilising a staggering 87 per cent of the total yield of the Mountain Aquifer’s trans-boundary basins, Palestinians just 13 per cent, while on the crucial Western Basin, the most important ‘shared’ Israeli–Palestinian groundwater resource, the use ratio was more than 15:1.¹⁹

The emerging crisis in Gaza was very different, in both timing and form. In comparison to the West Bank, the Gaza region has relatively meagre water resources, with average annual rainfall of around just 300 mm and no perennial surface flows. Yet prior to 1948 the pressure on these resources was quite limited. Historically, Gaza had been known as a verdant oasis, a region of wells, orchards and relief after the long trek across the Sinai Desert (‘We have crossed seventy leagues of desert – a very tiring business. Brackish water, often none at all’, reported

¹⁸ S. Elmusa, *Water Conflict: Economics, Politics, Law and Palestinian–Israeli Water Resources* (Institute for Palestine Studies, 1997), 50, 265–6; Rouyer, *Turning Water*, 48, 53; Jerusalem Media and Communications Centre, *Water: The Red Line* (1994), 46; C. Messerschmid, *The ‘Prior Use’ Argument: Establishing Benchmarks and Implications of Historic Water Use, 1920–1948*, unpublished report for PLO Negotiation Support Unit (2015), 34; S. Loneragan and D. Brooks, *Watershed: The Role of Fresh Water in the Israeli–Palestinian Conflict* (International Development Research Centre, 1994), 130; Selby interview with Taher Nassereddin, West Bank Water Department (12/04/1998); Al-Haq, *Water for One People Only: Discriminatory Access and ‘Water Apartheid’ in the OPT* (2013), 59–67; Isaac and Selby, ‘The Palestinian water crisis’, 18–20; Selby, *Water, Power and Politics*, 83–9.

¹⁹ Selby, *Water, Power and Politics*, 89–90, 173–8; World Bank, *Developing the Occupied Territories: An Investment in Peace. Vol. 5: Infrastructure* (1993), 45; Israel and PLO, *Interim Agreement on the West Bank and Gaza Strip* (1995), Annex II, App. 1, Sch. 10.

Napoleon Bonaparte on the Sinai in 1799; but on Gaza, he observed, 'the climate might be that of Paris' while the 'lemon bushes, olive-groves, and broken ground are just like the scenery of the Languedoc'). In 1948, moreover, the local Palestinian population of Gaza numbered just 70,000 and there were no more than 200 wells abstracting just 10 mcm/y from the shallow alluvial aquifer. Events of 1948–9 changed all this, however. In the space of a year, the local population quadrupled as refugees poured in. The region was enclaved, with the Gaza Strip being established as a 40 km by 9 km ribbon of territory carved out of Mandate Palestine and placed under Egyptian administration. In the process, villages were cut off from their lands and refugees from external employment opportunities. And, altogether, these developments led to an unprecedented rise in groundwater use, setting off the long-term process of groundwater mining and destruction which continues to this day. By 1967, the Strip had an estimated 1,600–1,700 wells and was abstracting an estimated 100–120 mcm/y, a tenfold increase on the 1948 level. With a natural recharge of just 35 mcm/y, Gaza's portion of the Coastal Aquifer was already by this point being seriously mined and thus seeing both declining water table levels and some salinisation (thanks to inflows from both the Mediterranean and, above all, from deep saline aquifers within Israel).²⁰

Following Israel's capture of the Strip in 1967, the situation continued to worsen. Within the first two decades after the June War, there were huge increases in local citrus and vegetable cultivation and a more than 50 per cent growth in Gaza's Palestinian-irrigated area, as the territory was incorporated into, and made a dependent periphery of, the dominant Israeli economy. In addition, by the mid-1980s Gaza had become home to a score of Israeli settlements, most of them engaged in intensive irrigated horticulture and benefitting from disproportionate access to the Strip's meagre water resources. Although consistent data is lacking it seems clear, given this, that total water abstraction in Gaza must have further increased post-1967. Whereas in the West Bank the military government imposed strict rules on Palestinian groundwater use so as to ensure that the riches of the Mountain Aquifer would continue to flow towards Israel, in Gaza no equivalent hydro-political interest applied and

²⁰ Napoleon letter to Desaix (27/02/1799), in J. M. Thompson, *Letters of Napoleon* (Basil Blackwell, 1934), 58–9; UNCCP, *Final Report of the United Nations Economic Survey Mission for the Middle East* (1949), 19; Elmusa, *Water Conflict*, 93–4; C. Messerschmid, *Water in Gaza: Problems and Prospects* (Ibrahim Abu-Lughod Institute of International Studies, 2011), 2; World Bank, *Developing the Occupied Territories: Infrastructure*, 54; A. Vengosh et al., 'Sources of salinity and boron in the Gaza Strip: natural contaminant flow in the southern Mediterranean coastal aquifer', *Water Resources Research*, 41:1 (2005), 4, 18.

there was thus no equivalent permit or quota regime. Only from the mid-1980s did this change, as it became evident that over-abstraction and salinisation levels were becoming critical and significantly affecting citrus yields. Thus in 1984 metres were installed and quotas imposed on Palestinian agricultural wells, and from 1987 onwards all new Palestinian well licences were refused. As in the West Bank, Palestinian water demand in Gaza was henceforth capped and suppressed, with water use declining as a result.²¹

Paralleling this, Gaza also faced deepening wastewater problems. Israel had made only the most limited investments in wastewater collection and treatment in the Occupied Territories, but whereas in the West Bank the main consequence of this was foul-smelling *wadis* and streams, in Gaza wastewater simply infiltrated into the territory's shallow aquifer, polluting the very water resource on which its population depended. Indeed, within the context of severe over-abstraction and declining groundwater levels, the pollution of Gaza's aquifer was a conscious Israeli strategy: wastewater was not allowed to be channelled to the sea, as ordinarily happens elsewhere; instead all of Gaza's collected wastewater was stored in internal sewage 'lagoons' which had boreholes drilled into them to facilitate percolation into the ground. As internal World Bank documentation correctly noted, Gaza thus faced an acute 'water quantity-quality dilemma', wastewater returns being 'the reason why depletion of Gaza's groundwater' was 'only happening very slowly', but also 'why quality deterioration' was 'happening relatively quickly'.²²

By the early to mid-1990s, as a result, the overall water situation in Gaza was as follows (we consider more recent developments in Chapter 7). Most of its groundwater was brackish or saline, with chloride levels exceeding 250 mg/l (the World Health Organization, WHO, standard for fresh water) in almost all areas and exceeding 1,000 mg/l in some. Nitrate levels were also well above accepted WHO levels, thanks to wastewater pollution. Most of Gaza's groundwater was not fit for drinking. And there were also problems of water availability. By the World Bank's conservative estimates, water use for domestic purposes was just 101 l/c/d, higher than in the West Bank (85 l/c/d) but still only around a third of the level in Israel (280 l/c/d). The disparity in agricultural water use was even larger. And average Gaza settler water consumption was

²¹ D. Kahan, *Agriculture and Water Resources in the West Bank and Gaza (1967–1987)* (West Bank Data Project, 1987), 94, 130, 143–5; S. Roy, *The Gaza Strip: The Political Economy of De-Development* (Institute for Palestine Studies, 1995); Elmusa, *Water Conflict*, 93–6; World Bank, *Developing the Occupied Territories: Infrastructure*, 53.

²² Messerschmid, *Water in Gaza*, 5–8; World Bank, *The West Bank and Gaza: Water Sector Review, Vol. I: Main Report* (internal report, 1997), 7.

more than seven times that of the average Gaza Palestinian. There was little political or violent water-related conflict, much less so than in the West Bank. However, so tangible and omnipresent were Gaza's water problems that leading Israeli journalist Amira Hass could name her powerful account of everyday life in the territory after them. And into the new millennium, so degraded have Gaza's groundwater resources become that the UN, and many others, have repeatedly warned that the territory could become 'unusable as early as 2016, with the damage irreversible by 2020'. While such claims are in truth without scientific basis – illustrative, once again, of Jared Diamond-style eco-collapse rhetoric – they are nonetheless indicative of the scale of Gaza's water crisis.²³

How should this situation be explained? In most accounts, Gaza's water crisis is depicted as the inexorable product of limited natural resource endowments combined with rapid population growth and rising water demand, accentuated by problems of poor and politicised governance; it is presented, in sum, in standard Malthusian fashion, as an essentially internally generated environmental scarcity crisis (as well as evidence of the supposed inability of Palestinians to properly manage their water resources). Yet this is misleading on at least two levels. First, the population pressures on Gaza's water resources are much less a function of natural growth than, as indicated above, of displacement and enclavement – of the mass displacement of Palestinians to Gaza during 1948–9 (which will be considered more fully in the next chapter) and of the inability of most Gazans to escape from what has effectively been turned into an open air prison. In the language of the UK government's 2011 foresight report on environmental migration, Gazans are a paradigmatically 'trapped population' whose chronic water vulnerabilities stem, at root, from politically-induced immobility. Second, although Gaza's groundwater resources are much more limited than those of the West Bank, internal resource scarcity is not its principal supply-side problem. Consider the fact that most cities today obtain their water supplies from well beyond their municipal boundaries. Consider too that the Coastal Aquifer around Tel Aviv was suffering from serious over-abstraction and salinisation as early as the 1930s, well before Gaza – and

²³ World Bank, *Developing the Occupied Territories: Infrastructure*, 49, 55, 67; Elmusa, *Water Conflict*, 122–3; B. Shomar et al., 'Elevated nitrate levels in the groundwater of the Gaza Strip: distribution and sources', *Science of the Total Environment*, 398:1–3 (2008), 164–74; B. Shomar, 'Groundwater of the Gaza Strip: is it drinkable?', *Environmental Geology*, 50:5 (2006), 743–51; World Bank, *Developing the Occupied Territories: An Investment in Peace. Vol. 1: Overview* (1993), 10; A. Hass, *Drinking the Sea at Gaza: Days and Nights in a Land Under Siege* (Henry Holt, 1996); UNSCO, *Gaza in 2020: A Liveable Place?* (2012), 11.

that this problem was only ameliorated through the large-scale transfer of water from the upper Jordan River. And consider, lastly, that Israel's highly integrated national water supply system, discussed in the previous chapter, largely bypasses Gaza, sending water in bulk to Beer Sheva and Negev farms but providing only a few million cubic metres each year to Palestinians in the Strip. Viewed thus, Gaza's core water supply problem is not so much local resource scarcity but that, unlike every other equivalent built-up area on the planet – Gaza essentially now being a city, and not a particularly large one at that – it is all but cut off from the lands around it and denied a meaningful hinterland (see Figure 6.1).²⁴ In these respects, Gaza's water crisis is neither an internal nor a Malthusian one, but essentially a product of politics at the frontier.

Israel's contrasting approaches towards the West Bank and Gaza are also instructive here. Whereas Israel has extensive religious, settlement and external defence interests in the West Bank, Gaza has always been primarily viewed instead as a waste ground of unwanted Palestinian bodies, a territory which, as Yitzhak Rabin expressed it, Israeli leaders fantasised might 'sink into the sea'.²⁵ Reflecting this, the West Bank was heavily settled and in most respects economically and infrastructurally incorporated into Israeli territory, while Gaza was not; the West Bank was turned into a colonisation frontier, but Gaza into a frontier enclave. Patterns of water infrastructure development and water insecurity reflected this contrast. The West Bank, as discussed, was heavily if asymmetrically integrated into Israel's national water supply network. Gaza, by contrast, was not; instead it was circumnavigated by Israel's supply lines to the Negev and left to the mercy of its own limited water resources and the encroaching sea. None of this was dictated by patterns of resource availability, still less by scarcity. Indeed it is notable that while the West Bank is a land of relative water plenty but acute water conflict – of political hostility over water supply inequalities and regular state violence against Palestinian supply infrastructures – Gaza is a land of relative water scarcity but no equivalent hydro-political discord or violence. As in Sudan, it is local resource abundance rather than scarcity that is most closely correlated with water-related conflict.

²⁴ J. Schwarz, 'Water resources in Judea, Samaria, and the Gaza Strip', in J. D. Elazer (ed.), *Judea, Samaria and Gaza* (American Enterprise Institute, 1982), 95–100; E. Weinthal et al., 'The water crisis in the Gaza Strip: prospects for resolution', *Ground Water*, 43:5 (2005), 653–60; UK Government Office for Science, *Foresight: Migration and Global Environmental Change, Final Project Report* (2011); Messerschmid, *Water in Gaza*; A. Hass, 'The most logical solution to the Gaza water crisis is the most political one', *Ha'aretz* (16/10/2018).

²⁵ D. Landau, 'Rabin expresses his frustration with Palestinian stance in talks', *Jewish Telegraphic Agency Daily News Bulletin* (04/09/1992).

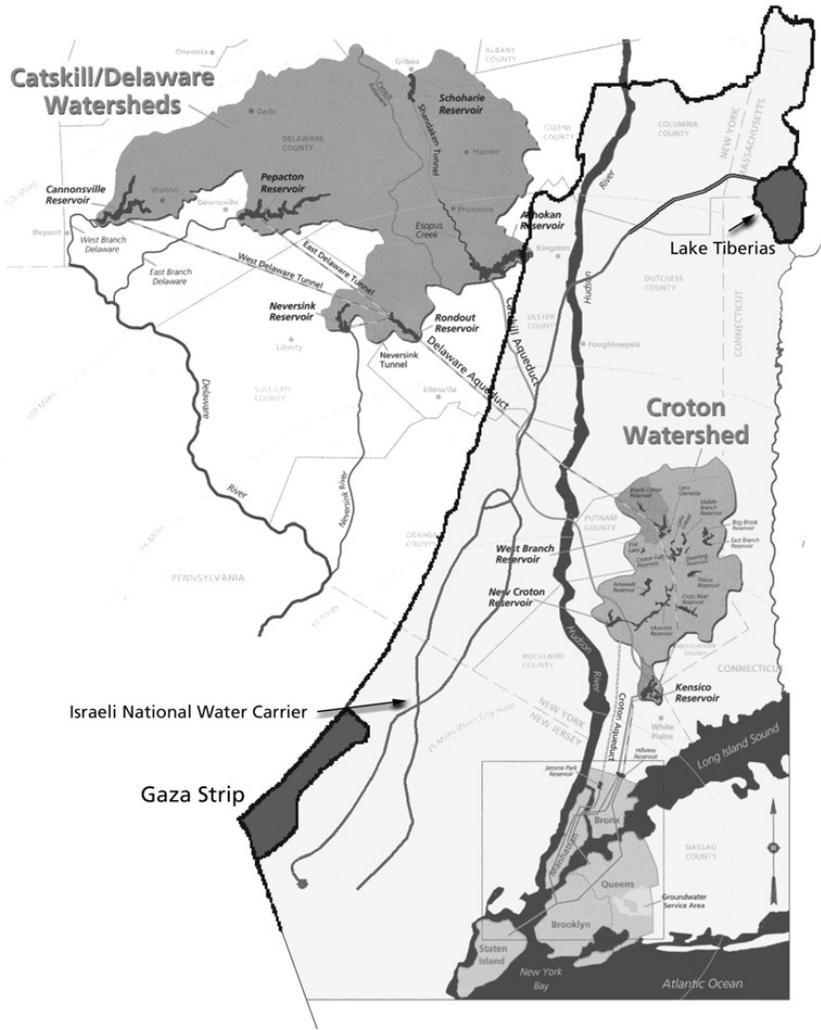


Figure 6.1 Gaza is Manhattan. This image, produced by Clemens Messerschmid, overlays Israel’s and New York City’s water supply systems, to scale. Like most cities New York is dependent on a hinterland for its water supply. The Gaza Strip, by contrast, is denied one – despite being not much bigger than Manhattan and having a far smaller population.

The Rise and Fall of Hasakah

Let us now return to Syria.²⁶ We have already seen, in the previous chapter, that over the four decades from the 1960s Syria's Ba'athist regime pursued a project of rapid state-led hydraulic and agricultural development. Moreover, we have also seen, while considering the Syria drought–conflict thesis, that Syria was experiencing a deepening agrarian crisis from the early 2000s onwards, well before the extreme drought of 2006/7–2008/9. This structural crisis, as discussed, was at a national level rooted in the decisive turn towards the market economy inaugurated by Bashar al-Assad following his accession to the presidency in 2000. In line with World Bank and International Monetary Fund (IMF) advice, a rural economic system, which for decades had been defined by state farms, agricultural input subsidies, food price controls and heavy investment in hydraulic infrastructures, was rapidly dismantled, leading to a nationwide decline in agricultural employment and a mass exodus to the peri-urban slum areas around Syria's cities. An economically unsustainable agrarian expansion was quickly followed by crisis, involution and out-migration.

Yet the above provides only a partial explanation of Syria's pre-civil war agrarian and rural out-migration troubles, for alongside these national-level dynamics were important regional ones, most crucially in that province where these problems were most extreme: the north-eastern-most province of Hasakah. Some context is required. Environmentally, Hasakah ranges from rolling, fertile plains along the border with Turkey, where annual precipitation can be over 600 mm, to steppe and desert lands in the south which receive rainfall of 200 mm or less. It is crossed north to south by what historically has been Syria's largest Euphrates tributary, the Khabour, which in turn is fed by a mass of perennial and seasonal tributaries; plus Hasakah has also historically possessed extensive groundwater resources, especially in the north. Prior to the 1930s, the area was barely cultivated let alone enclosed, its rural economy dominated instead by semi-nomadic Bedouin pastoralists working on open rangelands; in Bernard Lewis' formulation, Hasakah was part of Syria's 'zone of nomadism'. But from the 1930s onwards, and especially from the 1960s, it became Syria's major pioneering zone, the home of both the Ba'athist state's agricultural modernisation project and its nascent oil industry. Large-scale irrigation began in the 1950s, centred on the floodplains of the Khabour and its tributaries, before expanding significantly from the 1970s as the Syrian government, acting on advice from the FAO and the US Department of Agriculture, embraced the systematic

²⁶ This section summarises Selby, 'Climate change and the Syrian civil war, part II'.

exploitation of the region's groundwater resources. Open range lands were demarcated, privatised and appropriated, while the Bedouin pastoralists who had previously farmed them were pushed ever deeper into the *badiya* (desert) or isolated in marginal areas, progressively sedentarised and impoverished. In their place, people moved in or were resettled from elsewhere in the country, such that Hasakah came to witness exceptionally high in-migration and population growth. It was these processes of horizontal agricultural expansion underpinned by surface and especially groundwater irrigation, combined with land enclosure, displacement and large-scale in-migration and settlement, which led to Hasakah becoming Syria's 'bread-basket' region – accounting, by the 1990s, for up to half of the country's total wheat as well as cotton production.²⁷

The ecological, economic and social consequences of these frontier dynamics were profound. For one, the transformation of Hasakah into the country's 'breadbasket' was premised on, and only made possible by, unsustainable levels of groundwater abstraction. By the turn of the millennium, 78 per cent of the irrigated land area in the Khabour basin was receiving its water from wells, with total irrigation water use equivalent to more than 300 per cent of the basin's safe yield. As early as the late 1990s, groundwater levels were declining throughout Hasakah at a rate of several metres per year. Of course, Hasakah was not alone in facing such problems: by 2001, most basins across Syria were in water deficit; the country's annual water consumption exceeded sustainable yield by 20 per cent; and irrigation water use alone amounted to 99 per cent of the country's sustainable water yield as well as 85–90 per cent of total water use – with most of this coming from groundwater. That said, no other region of the country was home to such extreme groundwater dependence or over-abstraction. Well before the 2006/7–2008/9 drought, Hasakah's water resources were already being mined to a degree that, even by Syrian standards, was extraordinary.²⁸

Hasakah's surface water resources were also in steep decline. The Khabour River, which had historically been the lifeblood of the region's

²⁷ B. Lewis, *Nomads and Settlers in Syria and Jordan, 1800–1980* (Cambridge University Press, 1987), 4; Ababsa, 'Agrarian counter-reform', 85; J. Kolars and W. Mitchell, *The Euphrates River and the Southeast Anatolia Development Project* (Southern Illinois University Press, 1991), 144; Hole and Zaitchik, 'Policies, plans, practice'; D. Chatty, 'The Bedouin in contemporary Syria: persistence of tribal authority and control', *Middle East Journal*, 64:1 (2010), 29–49; Khawaja, *Internal Migration*, 25; Selby, 'Climate change and the Syrian civil war, part II', 263.

²⁸ C. Varela-Ortega and J. Sagardoy, 'Irrigation water policies in Syria: current developments and future options', in Firillio and Vercueil, *Syrian Agriculture*, 340, 343; D. Orešić and G. Bahnman, 'Water resources in agriculture in north-eastern Syria (governorate Al Hasakah)', *Hrvatski Geografski Glasnik*, 68:1 (2006), 87–9 (in Croatian); World Bank, *Syrian Arab Republic Irrigation*, 11, 13.

agricultural economy, ceased being a perennial river in the late 1990s and became a seasonal stream, dry at the regional capital of Hasakah for six months of the year. The main source spring of the Khabour River, at Ras al-Ayn, which had hitherto discharged around 1.5 bcm/y – a flow volume which made it one of the world’s great springs, the so-called ‘great karst spring of Mesopotamia’ – had, by 2002–10, declined to just a tenth of this level. Both agricultural production and settlement were inevitably affected. Between 1990 and 2000, as the Khabour dried, the cultivated area within the upper Khabour, north of Hasakah city, declined by more than 40 per cent, and within the lower Khabour by nearly 75 per cent. Even prior to 2000, settlements were being abandoned both within the Khabour floodplain and in areas of particularly excessive groundwater irrigation. As these processes unfolded, production shifted instead to off-river and increasingly marginal plots, including areas of the steppe with average rainfall below 200 mm where groundwater dependency was even higher and agricultural production more precarious. And cotton and wheat production, which had risen steeply during the 1980s and 1990s, peaked around 2000 before then going into secular decline. Although this pattern was not unique to Hasakah, nowhere else in Syria did it take such an extreme form. As is typical of frontier and late developing regions, the excesses and contradictions of development were especially acute there. In only a few decades, Hasakah went through the full cycle of boom and bust – from open rangeland to national breadbasket before collapsing into what Watts, in another context, has called a ‘recessional frontier’.²⁹

While the proximate cause of this pattern was the discovery and exploitation of groundwater resources followed by their rapid depletion, three other sets of frontier dynamics were also at work; these are key to explaining both the region’s overall rise and fall, and its water problems in particular. To start with, both because of its peripheral location and its unique political economy, Hasakah’s agrarian transformation was not accompanied by any equivalent industrial let alone service sector

²⁹ D. Orešić and G. Bahnan, ‘River regime changes in the upper part of the Khabour catchment area in north-eastern Syria in the second half of the XXth century – part I: annual runoff’, *Hrvatski Geografski Glasnik*, 67:1 (2005), 56 (in Croatian); D. Orešić and G. Bahnan, ‘River regime changes in the upper part of the Khabour catchment area in north-eastern Syria in the second half of the XXth century – part II: mean monthly runoff’, *Hrvatski Geografski Glasnik*, 67:2 (2005), 84 (in Croatian); Syria CBS, ‘Length of rivers within the Syrian land and their flow rates’ (2010); UN-ESCWA, *Inventory of Shared Water*, 91; D. J. Burdon and C. Safadi, ‘Ras-el-Ain: the great karst spring of Mesopotamia: an hydrogeological study’, *Journal of Hydrology*, 1:1 (1963), 58–95; Hole and Zaitchik, ‘Policies, plans, practice’, 141–8; Hole, ‘Drivers of unsustainable land use’, 6–7; Selby, ‘Climate change and the Syrian civil war, part II’, 262–4; M. J. Watts, ‘Frontiers: authority, precarity and insurgency at the edge of the state’, *World Development*, 101 (2018), 482.

investment, leaving the province dominated by primary agricultural (plus fossil fuel) production. Hasakah and neighbouring parts of the north-east were thus the poorest in Syria: in 2003–4, according to the UNDP, 58 per cent of Syria's poor resided there and 18 per cent of the region's rural population were living in extreme poverty. Moreover, during the early 2000s, as Bashar al-Assad's liberalisation programme unfolded, poverty levels in the region deteriorated, despite improving across most of the country. It is not difficult to see why this was. A region that had benefitted disproportionately, if unevenly and distortedly, from a national agrarian project would inevitably also be disproportionately affected when the core underpinnings of this boom – subsidised fuel and fertilisers, price controls on agricultural products, state farms and locally abundant water resources – were suddenly removed. It should be no surprise, given this, that while farming employment declined right across Syria from 2000 onwards it declined particularly sharply in Hasakah: by 2008 its official unemployment rate was 28 per cent, near double that of any other province in the country.³⁰ Hasakah's frontier water crisis was in these senses a product of its distinctively frontier economy.

Part of the reason for this, second, lay in the province's ethnic composition: majority or near-majority Kurdish, and home to the largest concentration of non-Arabs in the country. Although Syria's Kurds had historically not been subject to anything like the same level of extreme state violence and repression as in neighbouring Iraq or Turkey – at least not prior to the civil war – the Syrian state and its Arab nationalist leaders had long waged a quiet war against them. At extreme, Syria's Kurds were viewed, in the rightly infamous words of Muhamed Talab Hilal, head of security in Hasakah during the 1960s, as 'a people who have no history, civilisation, language, or ethnic origin'; who are 'dirt' that requires 'purification' by 'the Arab conscience'; who are 'a malignant tumour on the side of the Arab nation and must be removed'.³¹ And this shaped Hasakah's frontier dynamics in two ways.

On the one hand, from the 1970s onwards the Syrian state pursued a programme of Arabisation aimed at expanding and consolidating Hasakah's Arab population. The most well-known instance of this was during 1973–6 when, in line with proposals made by Talab Hilal, more than 20,000 Arab villagers were transferred from land flooded during the creation of Lake Assad to forty-two model farming settlements in Kurdish areas of northern Hasakah, the so-called 'Arab Belt'. Like the other stated colonisation schemes examined in this chapter, these Arab

³⁰ El Laithy and Abu-Ismael, *Poverty in Syria*, 1, 3, 27; Aita, *Labour Market Policies*, 32.

³¹ M. Gunter, *Out of Nowhere: The Kurds of Syria in Peace and War* (Hurst, 2014), 22–3.

settlements benefitted from wide-ranging state subsidy and support, and involved the widespread expropriation of land and attendant water resources. More broadly, the many other Syrian Arabs moving into Hasakah from the 1970s onwards also benefitted from easy access to government credit and subsidies, to the extent that Syria's supposedly nationwide system of agrarian support effectively functioned as an instrument of Arabisation. As one telling example of this, the 2009 UN and Syrian government drought relief programme in Hasakah focused entirely on one of the provinces' Arab districts, despite the fact that Kurdish communities were also affected by the drought and indeed were probably more vulnerable to it. Hasakah became Syria's pre-eminent frontier region and then experienced such a steep agrarian collapse, not only because of its untapped land and water resources but – just as within the adjacent Kurdish-dominated region of southeast Turkey – because agricultural development facilitated internal colonisation and the extension of state control over a heavily ethnic minority-populated territory.³²

Alongside this project of Arabisation, the Syrian state also pursued efforts to exclude, control and weaken Hasakah's indigenous Kurdish population. The 1962 Hasakah census, undertaken, spuriously, in just one day and in Hasakah province alone, created a class of several hundred thousand 'non-citizen Kurds' who, shorn of their citizenship rights, could not own or rent land, work in the public sphere or receive state loans or benefits; by 2009, there were an estimated 250,000–300,000 such 'stateless Kurds' in Syria, mostly in Hasakah. This denial of political rights and citizenship was accompanied by widespread land expropriation, first during the 1960s – both as a direct consequence of the 1962 census and through Syria's 1963 agrarian reform programme – and later during the creation of the Arab Belt; reflecting this, an unusually high proportion of land was expropriated in Hasakah and the Jazira. In addition, from 1964 the whole of Hasakah was defined, unusually among Syrian provinces, as a 'border area', such that the Ministry of Interior and other departments were granted multiple vetoes over land use development. These arrangements were selectively enforced to restrict Kurdish development, and were further tightened through Presidential Decree 49 of 2008, which once again was applied to all of Hasakah (and Qunaytirah, bordering the Israeli-occupied Golan Heights) only – resulting in it being widely denounced by Kurdish rights activists as 'a continuation of the Arab

³² Meyer, 'Rural development', 249–59; HRW, *Syria: The Silenced Kurds* (1996); UN-OCHA, *Syria Drought Response Plan 2009–10, Mid-Term Review*, 4; De Schutter, *Report of the Special Rapporteur*, 12; 'The forgotten people: Kurds in Syria'; *Kurdish Aspect* (09/11/2010).

Belt policy' and 'a decree of ethnic cleansing and demographic change'. Such systemic discrimination must have been an important factor in Hasakah's pre-civil war socio-ecological crisis.³³

Far from being merely internal issues these frontier dynamics also had international dimensions, rooted in regime concerns about the trans-national Kurdish question and its hold over a valuable if peripheral province. Thus the Arab Belt was intended not just to help Arabise Hasakah's population, but also to create a cordon sanitaire along the border with Turkey which would separate Hasakah's Kurds from the much more numerous and politically radical Kurdish population of south-east Anatolia, it being for this reason that it took the form of a 15 km-deep band of villages extending 280 km along the Turkish border. Similarly, the Syrian government justified its denial of citizenship to 'non-citizen Kurds' on the grounds that, following its 1963 agrarian reforms, there had been an increase in illegal immigration by Turkish Kurds hoping to benefit from land redistribution.³⁴ The Syrian state's exclusion and dispossession of Hasakah's Kurds was rooted in insecurities that were international and geopolitical, as much as internal.

Last, Hasakah's borderland location also contributed to its mounting water crisis in a more direct way, since the surface and groundwater resources on which Hasakah is naturally dependent are not internal but cross-border, being mostly recharged over the Taurus Mountains. An estimated 83 per cent of the total flow of the Khabour River naturally originates in Turkey, such that the latter's large-scale development of these resources since the late 1980s has had a major bearing on Hasakah's water supplies. It is impossible to say where the balance of responsibility lies for the drying up of Ras al-Ayn and the Khabour River and the general collapse of Hasakah's groundwater levels, since this would require coordinated monitoring and modelling on both sides of the border – and no such work has ever been undertaken. Yet irrigation development on the Turkish side of the border was so intense between 2001 and 2015 that there was a secular increase in vegetative cover there, by contrast with a marked decrease within Hasakah itself.³⁵ What seems clear, therefore, is that Turkey must bear at least some share of responsibility for the rapid degradation of Hasakah's water

³³ HRW, *Group Denial: Repression of Kurdish Political and Cultural Rights in Syria* (2009), 10; De Schutter, *Report of the Special Rapporteur*, 14; H. Allsopp, *The Kurds of Syria: Political Parties and Identity in the Middle East* (I.B. Tauris, 2015), 25–7, 149–55, 160; Meyer, 'Rural development', 251; Tejel, *Syria's Kurds*, 60; Kurdwatch, *Decree 49: Dispossession of the Kurdish Population?* (European Center for Kurdish Studies, 2010).

³⁴ Meyer, 'Rural development', 258; HRW, *Syria*, App. A.

³⁵ Kolars and Mitchell, *Euphrates River*, 191, 222; L. Eklund and D. Thompson, 'Differences in resource management affects drought vulnerability across the borders between Iraq, Syria and Turkey', *Ecology and Society*, 22:4 (2017), 9.

resources, perhaps even the lion's share. As in Gaza, the politics of the border has been constitutive of groundwater crisis.

The combination of deep poverty, major oilfields, abundant waters, wide open spaces for enclosure and colonisation, distance from Damascus, a substantial Kurdish population and proximity to both Turkey and Iraq all conspired to make Hasakah a uniquely sensitive as well as opportunity-laden frontier region, and modern Syria's pre-eminent site of internal colonisation, ethnic discrimination and unsustainable development. The region's pre-civil war groundwater crisis and its extreme vulnerability to the 2006/7–2008/9 drought – in short, its exceptional levels of water resource degradation and water insecurity – were the inexorable consequences. As in South Kordofan, Darfur and the West Bank and Gaza, in Hasakah too frontier abundance proved to be double-edged. Yet, as within our other cases, this relative resource abundance was not the fundamental cause of what subsequently ensued. Rather, Hasakah's pre-civil war water crisis was, like the broader military and insecurity crises to follow, in large measure a legacy of dynamics set in motion by the Sykes–Picot Agreement and Treaty of Lausanne eighty years previously.

The Lake Chad Basin: Nigeria's Outstanding Internal Frontier

More than our other cases, the frontier character of the Lake Chad region derives, at one level, from brute facts of geography: its cross-border location; its huge distance from three of the four national capitals (Niamey is 1,200 km away from Lake Chad, Abuja and Yaoundé each around 1,000 km away); its Sahelian ecology jutting out into the Sahara; the complex wetland social ecology of Lake Chad itself; and the long history of attenuated state authority and local resistance which has, almost inevitably, followed. And yet, as we have sought to illustrate, contemporary frontiers are above all products of uneven development and state-building within the context of global capitalist intensification and transformation; 'frontierity' today is a function of history and political economy much more than physical geography. In what follows we illustrate this once again, focusing mainly on the Nigerian portion of the Lake Chad basin, the states of Borno, Adamawa and Yobe which have been at the epicentre of the 'Lake Chad crisis'.

We must start with the colonial era. Under British rule from 1861 onwards, northern and southern Nigeria were administered largely separately, with distinctive systems of law, land tenure and governance, and Native Administrations structured around regional 'tribal' majorities – in

northern Nigeria, the Hausa-Fulani. Indeed, Lord Lugard's system of indirect rule was pioneered in Nigeria (and Uganda), before being rolled out elsewhere including, as discussed in Chapter 4, within Sudan. Unlike Sudan, however, colonial development in Nigeria focused on the south, while northern development was actively restricted with a view to preventing the erosion of traditional authority and the rise of threats to British rule. As a result, on independence in 1960 northerners accounted, for instance, for just 2 per cent of senior civil service posts and the north had under 6 per cent of the country's secondary schools. In addition, both under British rule and afterwards the north-east was treated as peripheral even within Nigeria's north. Following independence the north-east remained politically under-represented, economically neglected and conspicuously poor, with particularly high poverty rates, low educational access and more. Indicatively, only in 1964 was Nigeria's railway network extended to Maiduguri; not until the late 1970s was a paved road laid between Maiduguri and the town of Baga, near Lake Chad.³⁶

In a departure from this pattern of colonial and early post-colonial marginalisation, however, from the 1970s north-east Nigeria became a site of intense state-led and internationally supported agrarian development. Nationally, agricultural expansion and intensification became prioritised as never before, partly in response to the Biafran war and famine of 1967–70 and the Sahelian droughts of the early 1970s, and partly simply in line with policies being adopted across the post-colonial world, including, as we have seen, in Syria and Sudan. Successive initiatives and national development plans – 'Operation Feed the Nation' launched in 1976 by the military government of Olusegun Obasanjo; Shehu Shagari's 'Green Revolution' programme which replaced it – prioritised irrigation development and increased wheat and rice production, in particular. A system of River Basin Development Authorities was established, including, among the first of these, the Chad Basin Development Authority. And the north-east specifically was identified as a prime region for agricultural expansion and intensification, for reasons which should, by now, be familiar: its assumed abundance of land; its abundance of under-exploited water resources; its relatively sparse population; and the benefits of developing

³⁶ A. R. Mustapha, *Ethnic Structure, Inequality and Governance of the Public Sector in Nigeria* (UN Research Institute for Social Development, 2006); B. Archibong, 'Historical origins of persistent inequality in Nigeria', *Oxford Development Studies*, 46:3 (2018), 325–47; Mamdani, *Citizen and Subject*, 7, 104, 113–14; G. Magrin and M.-A. Pérouse de Montclos (eds.), *Crisis and Development: The Lake Chad Region and Boko Haram* (Agence Française de Développement, 2018), 86; G. Magrin and G. M. Ngaressesem, 'Le lac Tchad et les échanges: un pôle agricole exportateur', in Lemoalle and Magrin, *Développement du Lac Tchad*, 565, 570.

and integrating what successive national governments viewed as a strategically important but long resistant borderland region.³⁷

Hydraulics were central to this mission of developing the north-east. Under the South Chad Irrigation Project (SCIP), launched in 1972 as ‘the largest and perhaps the most ambitious’ irrigation project in Nigeria, water was to be pumped from Lake Chad and distributed through canals to irrigate over 100,000 hectares of land for wheat, rice and cotton production. Under the Baga Polder project, launched at the same time, a 32 km barrier was constructed around part of the lake to capture seasonal flooding, with the aim of irrigating 20,000 hectares of land. In addition, and more significantly, dams were constructed along all the rivers feeding Lake Chad, together with state-owned irrigation schemes. In total since the 1970s, Nigeria has constructed twenty-seven dams along the Komadougou-Yobe River and its tributaries, including the 1,345 mcm-capacity Tiga Dam, the 1,140 mcm-capacity Hadejia Dam and the 930 mcm-capacity Chellawa Gorge Dam; while, in parallel, both Chad and Cameroon have built major dams on the Chari-Logone. In addition, a series of World Bank supported Agricultural Development Projects (ADPs) were launched to assist the ‘traditional’ agricultural sector – these initially focusing on rain-fed agriculture but then, from the early 1980s, on small-scale groundwater irrigation, providing farmers with subsidies and loans for drilling tube wells and purchasing diesel pumps.³⁸

Many of these initiatives fell way short. Lake Chad’s contraction during the 1970s and early 1980s left many of the SCIP’s distribution canals stranded well away from the water’s edge such that, by 1983–4, only around a tenth of the promised area was being cultivated. By the mid-1990s, the Baga Polder project had only about 1,000 hectares under irrigated cultivation. More broadly, recurring problems of water distribution and salinisation, combined with reduced state support within the context of declining oil revenues and structural adjustment programmes, meant that many of Nigeria’s large-scale hydraulic and agricultural

³⁷ H. O. Sano, *The Political Economy of Food in Nigeria 1960–1982* (Scandinavian Institute of African Studies, 1983), 24–30; K. Kimmage, ‘The evolution of the “wheat trap”: the Nigerian wheat boom’, *Africa: Journal of the International African Institute*, 61:4 (1991), 471–501; A. Kolawole, ‘RBRDAs and vulnerability to hunger in Nigeria: the case of the South Chad Irrigation Project’, *Food Policy*, 13:4 (1988), 389–96.

³⁸ Kolawole, ‘RBRDAs’, 392; M. Bertoncin and A. Pase, ‘Interpreting mega-development projects as territorial traps: the case of irrigation schemes on the shores of Lake Chad’, *Geographica Helvetica*, 72:2 (2017), 247–9; GIZ, *Joint Environmental Audit on the Drying up of Lake Chad* (2015), 154–6; Sano, *Political Economy*, 42; K. Kimmage, ‘Small-scale irrigation initiatives in Nigeria: the problems of equity and sustainability’, *Applied Geography*, 11:1 (1991), 5–20.

development projects failed to realise their potential. Nonetheless, the dam schemes along with small-scale groundwater irrigation quickly transformed the north-east into Nigeria's 'breadbasket' region, focused on wheat, rice, maize and tomato production. Between 1976 and 1995 alone, Borno's cultivated land area increased from 2.9 to 3.8 million hectares, around 51 per cent of its total land area, while in the decade to 2010 it increased by a further 380,000 hectares.³⁹

The environmental consequences have, unsurprisingly, been profound. Since the 1960s the Chari-Logone River, the main source for Lake Chad's southern pool, has seen its average flow drop by at least 50 per cent. The Komadougou-Yobe River, feeding the northern pool, has reportedly declined by even more. Those studies that have analysed this have all identified local human activities – that is, surface and groundwater withdrawals – rather than drought as the main cause of this low river flow and the lake's minimal recovery since the 1970s–1980s. In particular, although data is scant on this, Nigeria's development of the Komadougou-Yobe may largely explain the non-recovery of the northern pool since the 1980s. The construction of dams has also disrupted downstream seasonal flooding, with attendant ecological as well as social consequences. Across the north-east, the clearance and levelling of land to make way for irrigated agriculture has led to soil erosion and damage to soil structure and soil fertility. And abstraction for irrigation has been identified as a major cause of widespread groundwater depletion in north-east Nigeria, groundwater levels across Borno having declined by several metres per year since the 1960s.⁴⁰

These environmental consequences aside, agrarian development has also been accompanied by sweeping changes to the political economy of Nigeria's north-east. As in Sudan, the new state-led agrarian development drive coincided with, and was in part facilitated by, transformations

³⁹ W. M. Adams, 'Large scale irrigation in northern Nigeria: performance and ideology', *Transactions of the Institute of British Geographers*, 16:3 (1991), 287–300; Bertoncin and Pase, 'Interpreting mega-development'; UNEP, Lake Chad Basin: GIWA Regional Assessment 43 (2004), 49, 62; World Bank, *Assessment of Vegetation and Land Use Changes in Nigeria between 1976/78 and 1993/95* (1998), 8/24, 8/107; A. O. Arowolo et al., 'Assessing changes in the value of ecosystem services in response to land-use/land-cover dynamics in Nigeria', *Science of the Total Environment*, 636 (2018), 597–609.

⁴⁰ Lemoalle, 'Le fonctionnement hydrologique du lac Tchad', in Lemoalle and Magrin, *Développement du Lac Tchad*, 23–5; GIZ, *Joint Environmental Audit*, 45; Mahmood and Jia, 'Assessment of hydro-climatic trends'; Zhu et al., 'Relative contribution'; T. Wallace, 'Agricultural projects and land in northern Nigeria', *Review of African Political Economy*, 7:17 (1980), 65–6; Kimmage, 'Evolution of the "wheat trap"', 492–5; UNEP, *Lake Chad*, 51; S. Adamu et al., 'Groundwater depletion in the upper aquifer of the Chad formation, Chad Basin, north-eastern Nigeria', *Nigerian Journal of Technology*, 39:2 (2020), 621–31.

in local authority structures – the dissolution of the Native Authority system in 1968 and the reorganisation of the federal system in the 1970s through the creation of new states and the establishment of Local Government Areas (LGAs) – which resulted in a ‘virtual collapse’ of community-level governance structures. Property relations were also transformed; the 1978 Land Use Act nationalising communal lands and assigning their management, formerly under traditional authorities, to LGAs and state governors. In turn, the main beneficiaries of the large-scale agricultural projects during this period – those benefitting most from allocations of land, water, loans and subsidies – were an elite group of absentee military officers, high-ranking civil servants and wealthy urban business people. Rapidly rising wheat prices plus the ready availability of subsidies resulted in ‘a wheat-induced land scramble in the northern states of Nigeria’, led by wealthy ‘overnight farmers’. Large swathes of land were cleared, levelled, enclosed and then cultivated, intruding on land previously used for dry season grazing and contributing to an increase in land-related conflicts. Moreover, unable to afford water, seeds, machinery, fertilisers or labour costs, many smaller landholders rented or sold off their land, such that land ownership became increasingly concentrated. Although the ADPs ostensibly targeted small-scale producers with plots of just a hectare or two, in practice the result was the growth of cultivated plots of up to 300 hectares.⁴¹

One knock-on consequence was extensive migration, resettlement and displacement. The SCIP involved the relocation of around 50,000 people living in the project area – with land enclosed and people resettled on new plots as tenant farmers – plus plans to bring in another 50,000 people from other areas. Around 13,000 people were displaced for the construction of the Tiga Dam, while several thousand more were displaced to make way for canals, pilot farms and other irrigation project infrastructure – many to areas far from water and floodplain land and without adequate compensation given the rapidly rising land prices. Many of the newly landless poor migrated to regional urban centres. Meanwhile, others migrated to new agricultural frontiers, including land opened up by the recession of Lake Chad – an area of rich soils, good water availability and freedom from irrigation scheme restrictions. Indeed, during the decades prior to the eruption of the Lake Chad crisis there was net in-migration into the lake

⁴¹ A. R. Mustapha, ‘Understanding Boko Haram’, in A. R. Mustapha (ed.), *Sects and Social Disorder: Muslim Identities and Conflict in Northern Nigeria* (James Currey, 2014), 178; Magrin and Pérouse de Montclos, *Crisis and Development*, 88–95; Sano, *Political Economy*, 34–6; A. C. Okolie, ‘Oil rents, international loans and agrarian policies in Nigeria, 1970–1992’, *Review of African Political Economy*, 22:64 (1995), 200; Kimmage, ‘Small-scale irrigation’, 9–12.

region, at least within Nigeria. While the droughts of the 1970s–1980s certainly contributed to this migration, overall it was – as in Darfur – more a consequence of frontier-style grabbing of land and water resources than of a generalised condition of scarcity.⁴²

None of which is to suggest, of course, that either the emergence of Boko Haram in the mid-1990s as a sectarian political–religious movement critical of the Nigerian state, or its subsequent escalation and militarisation following the extrajudicial killing of its leader Mohammed Yusuf, and still less the security and humanitarian crises which followed, were essentially caused by the contradictions of agrarian development or environmental change. And yet it is clear that frontier dynamics, including those touched on above, were key to north-east Nigeria’s and the Lake Chad region’s early-2000s descents into violence and insecurity. By the early 2000s, north-east Nigeria had become a land of elite enrichment, home to levels of unemployment and poverty higher than anywhere else in the country. Moreover, Boko Haram’s recruits would largely derive from rural areas and small towns. Studies of the crisis’ socio-economic roots consistently point to such factors, noting the simultaneous marginalisation, exploitation and relative decline of the region, and the pervasive economic precarity there, as crucial to understanding the rise of Boko Haram. Like Hasakah in Syria’s north-east, north-east Nigeria had become, in Watts’ terms, an abandoned ‘recessional frontier’.⁴³

Resistance and Resilience

Long as this chapter already is, there is one further issue to discuss before concluding. For, from Lake Chad to Syria’s north-eastern borderlands, our analysis of the political ecology of frontiers has so far focused on their opening up, colonisation and development by the state – that is, on the power and agency of the state in relation to frontier spaces and populations, and on the insecurities, violence and environmental degradation which so often follow. Where local populations have been discussed, this has essentially been as victims of these state- and elite-led processes. Yet, to leave things here would be misleading for, however unequal the power relations are between colonising core and expropriated periphery, the

⁴² A. Kolawole, ‘Farm tenancy on the South Chad Irrigation Project, Nigeria’, *Land Use Policy*, 5:4 (1988), 438, 444; Wallace, ‘Agricultural projects’, 61–5; F. Réounodji et al., ‘Histoire du peuplement et logiques de mobilité’, in Lemoalle and Magrin, *Développement du Lac Tchad*, 155–60; Magrin and Pérouse de Montclos, *Crisis and Development*, 35–8.

⁴³ Mustapha, ‘Understanding Boko Haram’, 171–6; Anugwom, *Boko Haram Insurgence*, 96–103; Magrin and Pérouse de Montclos, *Crisis and Development*, 130–1; Watts, ‘Frontiers’, 482–5.

latter is never just a victim and is never without agency. Frontiers are spaces of particularly acute state-induced socio-ecological crises, but they are also, because of this, spaces of heightened agency, adaptation, resistance and resilience.

Noting this is important for two inter-linked reasons. It is important, on the one hand, because while frontier agency does feature right across mainstream nationalist, neo-liberal, Malthusian and colonial discourse on development and the environment, this is typically in problematic ways. Thus local populations are widely portrayed as obstacles to progressive development, as beholden to outdated traditions and as inefficient water users; they are often criticised for their ‘non-payment culture’, for their ‘illegal’ abstractions and for over-breeding; and they are typically depicted, in sum, as authors of their own environmental insecurity. Such pejorative readings of frontier agency need contesting. Yet, on the other hand, poor and marginalised communities are all too rarely represented as possessing political as opposed to social agency vis-à-vis their environments, that is, as engaging in forms of environmental politics or environmentalism. Environmentalism itself is still widely thought of as a predominantly Northern middle-class concern, reflecting ‘post-materialist’ values and economic security. Eco-determinist thought includes no environmentalists, as already discussed in Chapter 2. And the goal of ‘protecting nature’ has historically often been allied to elite, state and colonial ambitions – as we see worldwide in militarised conservation practices and, within our cases, in the central place of the environment in Israeli society, where the protection and ostensible repair of nature has served as ideological cover for the expropriation of land. Within these contexts, ‘frontier environmentalism’ – and, more broadly, what Ramachandra Guha and Joan Martinez-Alier label ‘empty belly environmentalism’ and ‘the environmentalism of the poor’ – are even today often hidden from view.⁴⁴

Across our cases, such frontier or more broadly subaltern socio-ecological activism has taken a range of more or less explicitly political forms. In South Kordofan, the Nuba Mountains General Union – founded in the 1960s by Nuba intellectuals to expand their national political representation, promote pan-Africanism and oppose the Sudanese regime’s taxation policies – has opposed the appropriation of

⁴⁴ H. Gvirtzman, *The Truth behind the Palestinian Water Libels*, BESA Center Paper 238 (Begin-Sadat Center for Strategic Studies, 2014); R. Inglehart, ‘Post-materialism in an environment of insecurity’, *American Political Science Review*, 75:4 (2014), 880–900; R. Duffy et al., ‘Why we must question the militarisation of conservation’, *Biological Conservation*, 232 (2019), 66–73; Guha and Martinez-Alier, *Varieties of Environmentalism*; Nixon, *Slow Violence*.

their water-rich land by non-Nuba and non-Moro merchants and called for the eradication of 'feudalistic land policies and relations of production'. On the Nile, an array of indigenous rights, women's rights and dam-specific groups and committees mobilised to contest the Bashir regime's post-2000 dam building, as discussed in Chapter 5. And in the Occupied Palestinian Territories, the first intifada against Israel's occupation – which involved extensive grassroots mobilisation and local institution-building under the banners of Palestinian nationalism and self-reliance – led to the establishment of a raft of popular committees and NGOs to protect and support Palestinian agriculture and land and water resources, and advocate for Palestinian water rights.⁴⁵ Across these diverse sites women have often been at the forefront of resistance, reflecting the hyper-masculine character, and gendered consequences, of both mega-dam building and frontier colonisation. As these examples suggest, subaltern environmentalism is inevitably political, typically one element in a broader project of defending threatened subjectivities, identities, communities and livelihoods against state development ambitions, and militarised (and masculine) state power.

This is even more evidently the case in Syria where, from 2012, an autonomous Kurdish region – the region of Rojava – was established in the north-east of the country, committed both to defending Kurdish rights and to an explicitly eco-socialist political agenda. Inspired by the writings of US anarchist Murray Bookchin and their adaptation by Kurdistan Workers' Party founder Abdullah Öcalan, Rojava's revolution was built on three pillars: decentralised 'Democratic Confederalism', feminism and social ecology. The latter involved a commitment to moving away from the wheat monoculture and associated environmental degradation and exploitation to which north-east Syria had long been subjected by the Ba'athist regime, and in its stead developing a model of sustainable, localised and diversified cooperative agriculture. Indeed, this agenda was no accident, being a political response to the region's long-standing – and simultaneously ethnic and environmental – frontier domination by the Syrian state. Under Ba'ath Party rule, it 'would have been impossible to assemble three sewing machines for a textile workshop', explains Remziye Mihemed, finance minister of Rojava's Jazira canton, 'because a day or two later, regime functionaries would storm in and shut it down'. 'Tree planting had to be approved by three ministries, which made it all but impossible' and resulted in Hasakah looking 'like a single

⁴⁵ M. A. M. Salih, 'Generation and migration: identity crisis and political change among the Moro of the Nuba Mountains', *GeoJournal*, 25:1 (1991), 54–5; Kadouf, 'Marginalization and resistance'; Schmidinger, 'Spatial control'; Zeitoun et al., 'A "justice" reading'; J. R. Nassar and R. Heacock (eds.), *Intifada: Palestine at the Crossroads* (Praeger, 1990).

huge wheatfield’, observes one commentary. ‘Rojava could feed two or even three times its current population yet still 60 percent of Syrians living below the poverty threshold are Kurds from Rojava’, notes Ahmed Yousef, chairman of Afrin University. Whereas the Syrian state was happy to blame drought for the region’s agrarian crisis, as discussed in Chapter 3, a truer picture of its causes can be found in such statements from Rojava. The paradox, of course, is that the existence of an autonomous Rojava remains dependent on US support – and that large-scale agriculture, along with oil production, remain strategic assets for it within this context.⁴⁶

Less explicitly political, but political nonetheless, are everyday practices of frontier resilience. A note of explanation here. Within contemporary critical scholarship, ‘resilience’ is regularly characterised as a discursive invention of neo-liberal governance that has apolitical and individualising consequences. Yet as Caitlin Ryan has persuasively argued, within contexts of endemic state violence and dispossession, everyday practices of adaptation, improvisation and getting by can be thoroughly political – to the extent that the distinction between political ‘resistance’ and apolitical ‘resilience’ becomes erased. In the Palestinian context, most notably, practices of coping with, circumnavigating and quietly defying Israel’s occupation, while maintaining dignity in the face of its ritual humiliations and remaining stubbornly on the land, have been elevated to the level of collective national strategy: the strategy of steadfastness, or *sumud*. Practices relating to water provide a case in point. Thus in the West Bank households and communities respond to regular water supply cuts through a kaleidoscope of supply- and demand-side means: by using diesel generators and rubber tubing to fill rooftop water tanks; by collecting water from nearby springs; by purchasing it on informal tanker markets; by collecting groundwater for irrigation in large cisterns dug into steep-sloping land; by reusing grey water; by connecting to settler supply lines and irrigating their crops by night; through municipal rotation of water supplies to different parts of town; by showering at the houses of those friends or relatives who happen to have water; by leaving cleaning and laundry until the water returns; and much else

⁴⁶ M. Bookchin, *The Ecology of Freedom: The Emergence and Dissolution of Hierarchy* (AK Press, 1982); A. Öcalan, *The Political Thought of Abdullah Öcalan: Kurdistan, Woman’s Revolution and Democratic Confederalism* (Pluto, 2017); Internationalist Commune of Rojava, *Make Rojava Green Again* (Dog Section Press, 2018), 67–71; M. Knapp et al., *Revolution in Rojava: Democratic Autonomy and Women’s Liberation in Syrian Kurdistan* (Pluto, 2016), 320, 322; M. Bassiki, ‘Race for wheat heats up between Damascus, opposition’, *Al-Monitor* (07/04/2020).

besides. In Gaza, similarly, adaptations to the territory's chronic water quality situation have included the rise of private water treatment and tanker markets and household-level desalination: almost all Gazans rely on local desalination for drinking purposes. The point here is not to romanticise such practices: coping is a burden as well as anything positive and its weight is far from equally distributed: women, illustratively, tend to be the primary practitioners of *sumud*. Yet cognisance of people's immense 'adaptative capacities' is crucial to understanding the political ecology of the frontier – to understanding, for instance, why the despoilation of Gaza's groundwater resources has not made it 'unliveable' or an 'environmental refugee' crisis waiting to happen.⁴⁷ Frontiers are sites of extreme insecurity but they are also, as a corollary, ones of particularly profound resilience and resistance.

The New Frontier Lands of Climate Change

The sorts of desert, dryland and semi-arid frontiers examined in this chapter are a recurring obsession within eco-collapse and environmental conflict narratives. The Sahara Desert, we are told, is voraciously expanding. Everywhere, desertification is thought to be unfolding apace. The Sahel – the Sahara's 'border' or 'shore' – is a particular concern, imagined within UN organisations and European stabilisation units and development ministries as a region full of climate change-induced strife and potential climate refugees. The fears of collapse discussed in Chapter 2 find their main geographical corollary just here: at the semi-arid frontier.⁴⁸

⁴⁷ J. Joseph, 'Resilience as embedded neoliberalism: a governmentality approach', *Resilience*, 1:1 (2013), 38–52; C. Ryan, 'Everyday resilience as resistance: Palestinian women practicing *sumud*', *International Political Sociology*, 9:4 (2015), 299–315; P. Bourbeau and C. Ryan, 'Resilience, resistance, infrapolitics and enmeshment', *European Journal of International Relations*, 24:1 (2018), 221–39; R. Shehadeh, *The Third Way* (Quartet, 1982); Selby, *Water, Power and Politics*, ch. 8; J. Selby, 'Governance and resistance in Palestine: simulations, confrontations, *sumud*', in F. Cochrane et al. (eds.), *Global Governance, Conflict and Resistance* (Palgrave, 2003), 118–34; Hass, *Drinking the Sea*, 59–60; Oxfam GB, 'Water Markets in Gaza: An Emergency Market and Mapping Analysis (EMMA) Survey on Private and Public Supply Markets in Gaza' (2013); J. Peteet, *Gender in Crisis: Women and the Palestinian Resistance Movement* (Columbia University Press, 1991); UNSCO, *Gaza in 2020*; G. Bromberg, 'When Gazan refugees pour into Tel Aviv', *Times of Israel* (06/09/2015).

⁴⁸ C. Werrell and F. Femia, 'AFRICOM commander on climate change: Sahel receding almost a mile per year', Center for Climate and Security blog (18/03/2018), <https://climateandsecurity.org/2018/03/africom-commander-on-climate-change-sahel-receding-almost-a-mile-per-year/>; UNEP, *Livelihood Security, Climate Change, Migration and Conflict in the Sahel* (2011); J. Ribot et al., 'Climate of anxiety in the Sahel: emigration in xenophobic times', *Public Culture*, 32:1 (2020), 45–75.

That such fears are typically without empirical basis has already been amply demonstrated in previous chapters. Beyond this point, though, what is evident is that eco-collapse and environmental conflict narratives fundamentally misread the nature of frontier lands today. While such narratives essentially read frontier violence as arising from resource scarcities and, in turn, social contraction and retreat, the evidence in this chapter – and what we know of resource frontiers more broadly – suggests very differently. From South Kordofan, Darfur and Lake Chad to Israel-Palestine and north-east Syria, it is real or imagined abundances of land and associated water resources which have been the more fundamental invitations to conflict. In each of these contexts, technological or infrastructural changes combined with a state-led developmental project – some combination of pipelines, rail-lines, roads, tractors and tubewells, together a nationalist ideology and resources of state – have turned hitherto ‘under-developed’ lands and waters into highly valued resources and commodities. Across these cases, also, frontiers have consistently been marked by economic dynamism, immigration and settlement, widespread illegality, the expropriation and colonisation of land and resources, the dispossession of local populations and extreme levels of political contestation and violent conflict. The defining feature of contemporary frontier lands, in short, is not scarcity-driven recession, but their expansionary and conflict-laden incorporation into both circuits of state power and logics of global capital.

This is not to suggest, of course, that frontier lands are immune to recession or ecological crisis. From the American wildwood to late twentieth-century Hasakah, the development of barely regulated and contested frontier regions has always involved local environmental destruction, with this in turn leading to either out-migration or the ‘opening up’ of yet more, and more ecologically precarious, frontier territory. Moreover, because frontier development is typically facilitated and made possible by state projects and far-away interests, such regions are acutely vulnerable to political and economic changes, whether these be new strategies of population control or shifts in national subsidy regimes or international commodity markets. Recession, environmental degradation and with them exploitation and conflict are all endemic features of the frontier. Crucially, however, these are not consequences of natural scarcity but of the reverse: the ‘water frontiers’ examined in this chapter were all, at least once, regions of relative water abundance.

This does not mean, we should stress, that it is the natural distribution of water resources or water-related interests that are the principal drivers of conflict at the frontier. And yet, judging by our cases,

water is much more central to the dynamics of contemporary frontiers than is often recognised – including within research on resource frontiers and water politics. Classically, it was soil exhaustion which was the main limit factor on frontier agricultural production, with the clearing of forests and exploitation of ‘virgin soils’ being quickly followed by their rapid depletion, declining yields and onward migration. Paucities of fuel and labour and were also sometimes critical, though the one was typically mitigated by deforestation, the other by slavery or indentured servitude. Contemporary semi-arid frontier zones present a very different picture, however. Artificial fertilisers now enable multi-cropping and monocultures even in the thinnest of soils. Mechanisation and cheap diesel and electricity have hugely reduced demand for wood fuel and labour.⁴⁹ And the upshot is that, today, water scarcity has become the main limit factor on agricultural expansion in many semi-arid frontier regions while local water abundances – of groundwater resources in particular – have become its sine qua non. In many frontier regions water is effectively the new soil: the attribute that most gives value to land and which most makes land worth commodifying, appropriating, developing and fighting over.

What, though, of the future, especially within the context of accelerating climate change? Over the coming decades the world’s dryland frontier regions will inevitably experience significant climatic changes with equally inevitable (though also place-specific) environmental, economic and political consequences: nothing in the foregoing is meant to dispute this. However, if the past is any guide these climatic transformations will not be the central cause of frontier conflicts and insecurities since, within a global capitalist system, the latter are essentially rooted in projects of expansion, incorporation, colonisation and resource exploitation and capture. So long as our global order remains capitalist, new abundances and new projects of development and state expansion will inevitably be accompanied by new frontier rushes and frontier conflicts. Struggles to control land and its resources will intersect with longstanding or newly constructed divides between core and marginalised populations and, within these populations, along lines of class, race, gender and more. Unsustainable exploitation of local resources – the mining of soils, groundwater and so on – will repeatedly induce recession, out-migration and the further opening up of new frontiers. And the need to adapt to and mitigate climate change will furnish powerful new

⁴⁹ Turner, *Frontier*, 21–2; J. W. Moore, ‘Sugar and the expansion of the early modern world-economy: commodity frontiers, ecological transformation, and industrialization’, *Review*, 23:3 (2000), 409–33; B. Clark and J. B. Foster, ‘Ecological imperialism and the global metabolic rift: unequal exchange and the guano/nitrates trade’, *International Journal of Comparative Sociology*, 50:3–4 (2009), 311–34.

motivations and legitimations for frontier development, in some cases compounding pre-existing problems of unsustainable exploitation and social marginalisation. Semi-arid 'water frontiers' will thus in all likelihood continue to be sites of extreme environmental and socio-political contradictions – if anything, increasingly so. Yet at the same time climate change will open up entirely new resource frontiers far away from the divided environments considered in this book, especially in Greenland, the Arctic Ocean and the northern latitudes of Eurasia and North America. Although beyond the scope of the present analysis, a frontier optic surely suggests that, as the ice retreats in these northern regions, the developmental and, in turn, political and security consequences are likely to be huge. 'Frontiers', as Lord Curzon observed in 1907, are 'the razor's edge on which hang suspended the modern issues of war and peace' and 'the chief anxiety of nearly every Foreign Office in the civilized world'. Under conditions of accelerating climate change, something similar may come to apply once again.⁵⁰

⁵⁰ M. Nuttall, 'Imagining and governing the Greenlandic resource frontier', *Polar Journal*, 2:1 (2012), 113–24; K. Dodds and M. Nuttall, *The Scramble for the Poles: The Geopolitics of the Arctic and Antarctic* (Polity, 2016); G. Curzon, 'Text of the 1907 Romanes lecture on the subject of frontiers', www.dur.ac.uk/resources/ibru/resources/links/curzon.pdf.