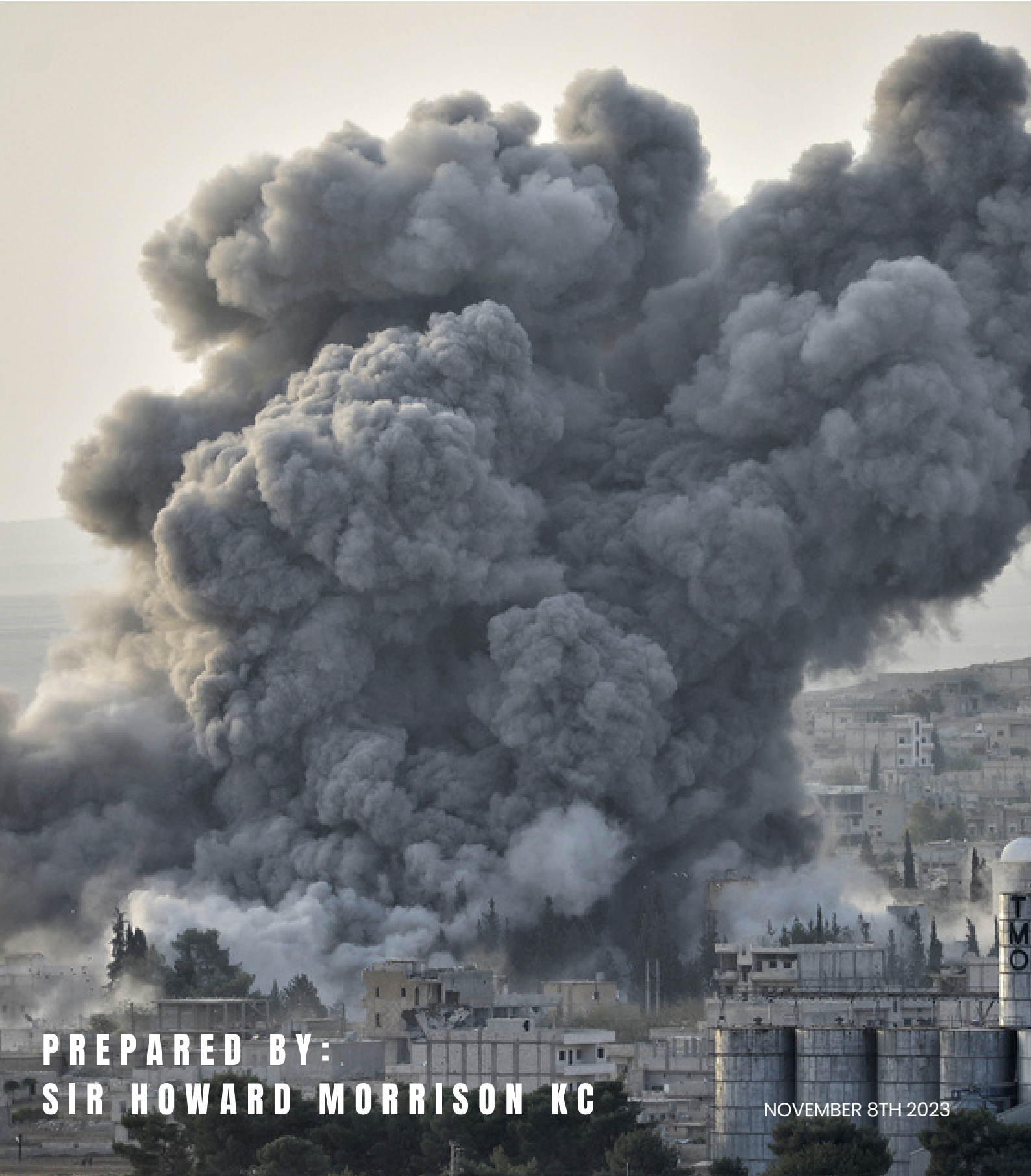


A CONTRADICTION IN TERMS: SYRIA'S ASSAD INVITED TO COP28 BY THE UAE

A REPORT ON THE ENVIRONMENTAL DEVASTATION OF THE SYRIAN WAR



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NOVEMBER 8TH 2023

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A. SUMMARY

1. The United Arab Emirates (the “UAE”) is due to host the 2023 United Nations Climate Change Conference (more commonly referred to as “COP28”) from 30 November – 12 December 2023.
2. Somewhat incredibly, the UAE has invited the Syrian President Bashar Al Assad to attend COP28. Syria was suspended from the Arab League on 16 November 2011 following the eruption of civil war in Syria. However, even though the conflict is still ongoing, Syria was readmitted to the Arab League on 7 May 2023 and Assad attended its 32nd summit in Jeddah, Saudi Arabia on 19 May 2023. Assad’s attendance at COP28 would be his first appearance at a global conference since the outbreak of the Syrian war in 2011.
3. The overwhelming human damage of the war in Syria is a matter of utmost concern which has rightfully received significant international attention. The war’s widespread environmental damage, brought sharply into focus with the UAE’s invitation of Assad to COP28, has unfortunately received less consideration.
4. This Report therefore concentrates on the extensive devastation and damage caused to the environment by Assad and his armed forces. It has been prepared at the request of Syrians who have suffered these abhorrent violations. It brings together wide-ranging materials in the public domain concerning the environmental crisis that has been unleashed on Syria, and evidence of those who are most responsible. In particular, the use of explosive weapons, attacks on the oil industry, damage to water and waste management systems, and conflict-related deforestation have had, and continue to have, ravaging environmental consequences for the nation and its people. Experts are still unable to predict the full ruinous impact that the war will have on Syria’s environment, as well as that of other nations.
5. Against this background, States are urged to take all diplomatic measures to ensure that Assad’s invitation to COP28 by the UAE is rescinded. It would be both hypocritical and perilous for Assad to be involved in climate talks whilst his government and armed forces have perpetrated, and continue to commit, environmental crimes unchecked on an alarming scale. States must not permit the UAE to assist Assad to be resurrected on the international stage through this ‘greenwashing’ exercise. States should rather ensure that COP28 addresses Syria’s gross environmental violations. It is essential that these widespread crimes are spotlighted and that those responsible are held to account by the appropriate bodies. Instead of COP28 being a

platform for Assad to seek to cleanse his inexcusable wrongs, it should be a time to expose the truth and seek accountability and remedial action.

6. Important recommendations are thus highlighted in this Report for the urgent consideration of all States and all COP28 participants (see Part D). It is vital that serious attention is given to this matter in the weeks before COP28 and at the conference itself.



An aerial image of destruction in Homs, Syria

B. RELEVANT BACKGROUND: SYRIA AND THE UAE

Syria

7. The conflict in Syria has been characterised by a lack of accountability for war crimes, crimes against humanity and grave violations committed in the conduct of hostilities for the past ten years. The United Nations Human Rights Council (the “UNHRC”) established the Independent International Commission of Inquiry on the Syrian Arab Republic (the “**Commission**”) through resolution S-17/1.¹ The mandate of the Commission is to investigate all alleged violations of international human rights law since March 2011 in Syria. The UNHRC has also tasked the Commission with establishing the facts and circumstances that may amount to such violations and of crimes perpetrated and, where possible, to identify those responsible with a view to ensuring that perpetrators of violations, including those that may constitute crimes against humanity, are held accountable. This general mandate has most recently been extended until 31 March 2024 (and the Commission has also been given special mandates at various points within the last decade to look into particular events).
8. The humanitarian crisis generated by the conflict in Syria is well-known. The current position is aptly captured by one of the Commission’s most recent reports dated 7 February 2023, which is based on its investigations between 1 July to 31 December 2022.² It reports that the conflict has intensified across several front lines during that period, with devastating consequences for civilians. There continue to be “*pervasive violations of human rights and humanitarian law across the country*”.³ 90% of civilians in Syria live in poverty. It is estimated that over 15.3 million people will require humanitarian assistance in 2023 compared to 14.6 million in 2022, which is the highest level of people in need since the beginning of the crisis.
9. Arbitrary arrests, disappearances and deaths in detention continue in Syria. The Commission noted that its interviewees “*consistently*”⁴ narrated that they had been beaten and blindfolded during interrogations, with some being held incommunicado for up to a year. The Commission also continues to receive accounts of poor detention conditions, including overcrowding, limited access to food, medicine and sanitary services. Torture and ill-treatment were

¹ Resolution S-17/1 (situation of human rights in the Syrian Arab Republic) adopted by the Human Rights Council at its seventeenth special session (available [here](#)).

² Report of the Independent International Commission of Inquiry on the Syrian Arab Republic dated 7 February 2023 and based on investigations during the period 1 July to 31 December 2022 (available [here](#)).

³ Ibid, p.1.

⁴ Ibid, p.14.

documented at various facilities operated by the Syrian National Army and, in some cases, this led to the death of detainees.

10. The Commission has accordingly been calling for mechanisms to investigate cases of disappearances as early as 2011. It published a paper in June 2022 calling for an institution with an international mandate to investigate the position of those who were missing or disappeared. This built on its proposals for such a body in its 2021 report on the same matter. The Commission also supported the Secretary-General's landmark report in August of that year, which clearly recommended to Member States that this international body should be established. In June 2023 the UN General Assembly finally adopted a resolution to establish an independent international institution to clarify the fate and whereabouts of tens of thousands missing and disappeared in Syria. The Commission lauded the creation of the body with its Chair Paulo Pinheiro stating as follows: *"This is a landmark resolution and a long-awaited step by the international community, finally coming to the aid of the families of all those who have been forcibly disappeared, abducted, tortured, and held in arbitrary and incommunicado detention over the past 12 years."*⁵
11. The Commission also observes in its February 2023 report that sexual and gender-based violence continue countrywide, against a framework of legislation which fails to effectively criminalise such violence. In particular, reports suggest that reconciliation between the families of the perpetrator and the survivor, based on the concept of honour, is often prioritised rather than the pursuit of accountability for perpetrators. Such reconciliation sometimes results in a forced marriage of the victim to the perpetrator, thus renewing the violation of a victim's rights.⁶
12. Human Rights Watch provides similar details in its 2023 World Report.⁷ It cites the warning from the Commission's chair in September 2022 that the country may return to *"larger-scale fighting"*. It also highlights that (i) more than 306,000 civilians were killed in Syria between 1 March 2011 and 31 March 2021, and (ii) around 111,000 people remain disappeared, most at the hands of the Syrian government.

⁵ UN Human Rights Council, 'UN Syria Commission of Inquiry lauds long-awaited international institution to clarify fate and whereabouts of tens of thousands missing and disappeared', 29 June 2023 (available [here](#)).

⁶ Report of the Independent International Commission of Inquiry on the Syrian Arab Republic dated 7 February 2023 and based on investigations during the period 1 July to 31 December 2022 (available [here](#)).

⁷ Human Rights Watch 'Syria: Events of 2022' (available [here](#)).

13. Human Rights Watch also explains that there has been recent reform to the legal framework relating to torture. On 30 March 2022 the Syrian government issued Law No. 16 of 2022 criminalising torture. This assigns a penalty ranging from three years' imprisonment up to the death penalty where the torture results in death or involves rape. Nonetheless, the NGO observes that Syrian security forces and government affiliated militias continue to arbitrarily detain, disappear and mistreat people across the country, including children, people with disabilities and older people, and returnees and individuals in retaken areas who have signed so-called reconciliation agreements.
14. The law has moreover been described by the Syrian Network for Human Rights as a “*pro forma response*” to a Dutch/Canadian move before the International Court of Justice and its dedicated report explains the position.⁸ Briefly, Syria acceded in 2004 to the UN Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment adopted by the UN General Assembly Resolution No. 39/46 of 10 December 1984 (“**UN Convention Against Torture**”). The Dutch Ministry of Foreign Affairs announced on 18 September 2020 its decision to hold the Syrian regime responsible under international law for gross human rights violations, particularly torture. Canada’s Minister of Foreign Affairs similarly announced on 4 March 2021 that his country had requested formal negotiations under the UN Convention Against Torture to hold the Syrian regime accountable for gross human rights violations, particularly torture. The two governments issued a joint statement on 12 March 2021 in which they announced their cooperation in holding the Syrian regime accountable for grave violations of international law, including torture under the UN Convention Against Torture. It was said that the effect of Syria being a party to the UN Convention Against Torture is that it could be prosecuted for any violations before the International Court of Justice. The Syrian Network for Human Rights suggests that the law was introduced in order to deal with these efforts to hold the Syrian regime accountable and sets out what it says are the fundamental faults in its text which “*empty it of any effectiveness*” and “*render it useless in practice*”.⁹
15. In addition to the efforts of the Dutch and Canadian governments, there have been a number of attempts to hold the government to account in respect of the humanitarian toll of the conflict in Syria. To take some relatively recent examples:

⁸ Syrian Network for Human Rights, ‘Laws’ 15 and 16 of 2022 Issued by the Syrian Regime: Textually Flawed and Impossible to Implement’, 28 April 2022 (available [here](#)).

⁹ Ibid, p.7.

- a. In 2019 an application was made to Fatou Bensouda, the (then) Prosecutor of the International Criminal Court (the “ICC”) to open an investigation into crimes against humanity of unlawful deportation from Syria to Jordan. The case was brought on behalf of 28 Syrian victims who were forced to flee over the border between Syria and Jordan and were living in refugee camps (Al Za’atari, Al Rajihi and Al Azraq).¹⁰
 - b. Individuals involved in the perpetration of crimes related to the conflict in Syria have, in some instances, been tried in courts through the application of universal jurisdiction. To take some recent examples, on 13 January 2022 a German court convicted and sentenced Anwar R. for crimes against humanity (a former member of Syria’s General Intelligence Directorate, one of the country’s four main intelligence agencies commonly referred to collectively as the mukhabarat). In February 2021 the same court sentenced Eyad A., another former Syrian intelligence official, to four and a half years in prison for aiding and abetting crimes against humanity. Furthermore, the French Court of Cassation held on 12 May 2023 that the necessary conditions were met for the French judicial system to adjudicate on the cases of Abdulhamid Chaban (a former Syrian soldier indicted for complicity in crimes against humanity in February 2019) and Majdi Nema (a former spokesperson for a Syrian armed group who faced war crimes, torture, and other charges).
16. To date, efforts to hold the Syrian authorities to account have concentrated on the humanitarian rather than environmental impacts of the conflict (see Part C of this Report below for a detailed discussion of the environmental damage).

The UAE

Oil and gas expansion

17. As the hosts of COP28, pointed questions have been raised about the UAE’s approach to the environment. In particular, there are indications that the UAE’s plans to increase oil and gas production could hinder its emissions’ reducing goals.

¹⁰ For further details please see relevant news coverage, for example, TRT World, ‘Groundbreaking case filed against the Assad regime at the ICC’, 2019 (available [here](#)). In short, Syria is not a Party to the Rome Statute which is the founding treaty of the ICC. That said, the ICC Pre-Trial Chamber ruled in 2018 “*that the [ICC] has jurisdiction over the alleged deportation of members of the Rohingya people from Myanmar to Bangladesh*” where Myanmar is not a Party to the Rome State but Bangladesh is. It was submitted on the basis of this precedent that there was a jurisdictional gateway for the ICC to open an investigation into crimes against humanity in Syria. Jordan, like Bangladesh, is a party to the Rome Statute. The ICC is yet to make a decision on this application.

18. The 2015 Paris Agreement is the clearest indication of global efforts to reduce emissions and, accordingly, global warming. It was adopted at COP21 in Paris on 12 December 2015 and entered into force on 4 November 2016. Both the UAE and Syria have signed and ratified the Paris Agreement (although Syria was not involved in the initial negotiations and only ratified the agreement in 2017).
19. The overarching goals of the Paris Agreement are well-known. In short, it sets out a global framework to avoid dangerous climate change by limiting global warming to well below 2°C above pre-industrial levels and pursuing efforts to limit it to 1.5°C above pre-industrial levels by the end of the century. To achieve this temperature goal, it states that parties should aim to reach a global peaking of greenhouse gas emissions as quickly as possible. Countries should reach net zero around the middle of this century.
20. Against this background, the efforts of many nations to reduce emissions, including those of the UAE, are not yet sufficient. Climate Action Tracker (“CAT”), an independent body that measures climate action against the globally agreed aims in terms of reducing emissions and global warming, considers countries against a series of metrics and produces both an overall rating, as well as ratings against those individual metrics. The UAE’s overall rating is ‘Highly Insufficient’.¹¹
21. The UAE has submitted nationally developed contributions (“NDCs”) in keeping with the requirements of the Paris Agreement (and CAT observes that the UAE was one of the few countries that submitted an updated NDC with strengthened emissions reduction targets in 2022, in advance of COP27).¹² That NDC sets a 31% emissions reduction target below a ‘business as usual’ scenario in 2030, which is a 13% decrease compared to its previous target. However, CAT rates this target as ‘Critically Insufficient’ when compared to the UAE’s fair share.
22. CAT’s assessment is that the UAE will not be able to achieve its NDC with its current policies. In particular, the UAE plans to expand its use of fossil fuels such as oil and gas. In summary:

¹¹ Climate Action Tracker, UAE Country Summary (available [here](#)).

¹² Ibid.

- a. Oil: The UAE is already amongst the world's ten largest oil producers and currently produces over 3 million barrels per day. It is a member of the Organisation of the Petroleum Exporting Countries (“OPEC”), the group of oil-producing companies which together control nearly 40% of the world's oil supply. The UAE has significant plans to further expand its oil production capacity. The country's national oil company, Abu Dhabi National Oil Company (“ADNOC”), announced in November 2022 that it would bring forward its oil production capacity target of 5 million barrels of oil per day from 2030 to 2027 in order to meet rising global energy demands.¹³ The company approved a \$150 billion spending plan in aid of this accelerated growth strategy. The International Energy Agency explicitly states that these plans are incompatible with the UAE achieving net zero by 2050. In order to achieve net zero, 90% of this oil would have to remain in the ground.

- b. Gas: The UAE is increasing its offshore gas production. ADNOC discovered offshore natural gas resources in February 2022. According to CAT, ADNOC has been awarded almost \$6 billion in contracts in order to maximise value from Abu Dhabi's offshore oil and gas resources.¹⁴ This is ostensibly to ensure that the UAE can achieve gas self-sufficiency. However, independent experts at CAT state that these efforts, together with the investments into new fossil fuel infrastructure, are inconsistent with limiting global warming to 1.5°C. They go on to predict that they are *“also likely to lock the UAE into a high-emissions trajectory and undermine its transition to renewable energy. Instead of ramping up its gas production towards self-sufficiency, the UAE should set out an ambitious plan to phase-out its dependency on gas for electricity and avoid the risk of stranded assets.”*

Aims of COP28

23. In the run up to COP28, the UAE has made a number of public statements about how best to achieve net zero. Sultan Al Jaber, the CEO of ADNOC and the individual selected to preside over COP28, spoke of the need to cut fossil fuel emissions at the Petersberg Climate Dialogue in Berlin (2 – 3 May 2023).¹⁵ This has generally been interpreted as support for the use of carbon capture and storage (“CCS”) technology to capture fossil fuel emissions.¹⁶

¹³ See, for example, reporting of ADNOC's announcement (available [here](#) and [here](#)).

¹⁴ See, for example, discussion at Climate Action Tracker, UAE Country Summary (available [here](#)).

¹⁵ Dr Sultan Al Jaber at 14th Petersberg Climate Dialogue, ‘The world demands transformational progress’, (available [here](#)).

¹⁶ See, for example, the Guardian, ‘COP28 host UAE's approach in ‘dangerous’, says UN's ex-climate chief’, 16 May 2023 (available [here](#)).

24. Jaber spoke again in pre-COP28 discussions in Bonn on 8 June 2023. He said on this occasion that the *“phase-down of fossil fuels is inevitable”*. He stated that *“the speed at which [the phase-down of fossil fuels] happens depends on how quickly we can phase up zero carbon alternatives, while ensuring energy security, accessibility and affordability.”* Experts have agreed that any such phase-down must be rapid.¹⁷
25. Jaber has also said in an interview with The Guardian reported on 13 July 2023: *“Phasing down fossil fuels is inevitable and it is essential – it’s going to happen... What I’m trying to say is you can’t unplug the world from the current energy system before you build the new energy system. It’s a transition: transitions don’t happen overnight, transition takes time.”*¹⁸
26. The use of CCS, as well the phase down of fossil fuels, are live debates within the climate community. They will be important topics of discussion at COP28. In relation to CCS, Christina Figueres, the former Executive Secretary of the UNFCCC has said that *“[w]e do not have CCS commercially available and viable over the next five to seven years. It’s just not going to happen. We have an issue of timing here, in addition to a moral issue.”*¹⁹ Hoesung Lee, chair of the IPCC, has separately said of CCS that it was *“no free lunch”* and that countries should be wary.²⁰
27. Majid Suwaidi, Director General of COP28, has said: *“We know that the energy mix that is going to achieve net zero is, if we’re serious about this conversation, going to include fossil fuels in some form. So I think that the discussion has to be about what is the proper mix, what is the proper language that allows us to achieve the emissions reductions that we need to achieve while allowing different pathways for different countries to achieve the net zero target... We can’t be exclusive [of CCS]. We need every solution on the table, every solution that works for different people is a good solution. There’s no silver bullet here.”*²¹

¹⁷ Ibid.

¹⁸ The Guardian, ‘Phase down of fossil fuel inevitable and essential, says COP28 president’, 13 July 2023 (available [here](#)).

¹⁹ The Guardian, ‘COP28 host UAE’s approach in ‘dangerous’, says UN’s ex-climate chief’, 16 May 2023 (available [here](#)).

²⁰ The Guardian, ‘Carbon capture and storage is ‘no free lunch’, warns climate chief’, 6 June 2023 (available [here](#)).

²¹ The Guardian, ‘Countries have not yet agreed to put fossil fuel phase-out on Cop28 agenda’, 7 June 2023 (available [here](#)).

28. There has also been debate about whether the goal should be a phase-down or phase-out of fossil fuels. The term ‘phase-down’ was agreed at last year’s COP27 after significant debate, but the EU has agreed to push for a global fossil fuel phase-out at COP28.²²

Attendance at COP28

29. It has been emphasised that given the ongoing very serious human rights and environmental abuses in Syria, Assad cannot be permitted to use COP28 as an opportunity for ‘greenwashing’ and re-entering the international community following Syria’s suspension from the Arab League in November 2011. It is evident that the UAE is assisting with this exercise through extending an invitation to COP28 to Assad and supporting his re-emergence on to the world stage. It is significant that Assad’s attendance at COP28 would be his first appearance at a global conference since the outbreak of the Syrian war in 2011.
30. There are also questions from the international community about the level of influence that the oil and gas industry will have at COP28. Jaber and Suwaidi have explained that they are welcoming oil and gas companies from around the world to participate more fully in COP28 as there is a “...need to engage the people who have the technical know-how, the skills, the technology – and by the way, the people who provide jobs – in a conversation about how they transform”.²³
31. Furthermore, the UAE has said that it will allow environmental activists to peacefully assemble at COP28. A joint statement between the UAE and the UNFCCC states as follows: “*In line with UNFCCC guidelines and adherence to international human rights norms and principles, there will be space available for climate activists to assemble peacefully and make their voices heard.*”²⁴ It is worth noting that official permission is required for demonstrations in the UAE, and that there have been critical issues raised by many NGOs about the country’s approach to freedom of expression, freedom of association, and dissent. A recent Joint Statement from 42 NGOs across the world has called on the UAE authorities to lift all restrictions in these areas in advance of COP28 and to guarantee human rights protections.²⁵ These restrictions have led to what the 42 NGOs refer to as a “*closure of civic space*”.

²² The Guardian, ‘Carbon capture and storage is ‘no free lunch’, warns climate chief, 6 June 2023 (available [here](#)).

²³ Ibid.

²⁴ Ibid.

²⁵ Joint Statement: UAE Human Rights Record Ahead of COP28, 1 May 2023 (available [here](#)).

C. THE ENVIRONMENTAL COST OF THE CONFLICT IN SYRIA

32. The conflict in Syria has had, and continues to have, a most serious impact on the environment. Experts cannot yet know the full extent. The country already faced environmental challenges prior to the war,²⁶ including in relation to solid waste management, water scarcity and contamination, soil degradation and air pollution.²⁷ The conflict has exacerbated these, as well as giving rise to new and separate problems. Analyses of environmental damage have identified widespread pollution and contamination related to the targeted destruction of infrastructure relating to oil production and the use of explosive weapons.²⁸
33. This Report sets out the environmental cost of the conflict in Syria (insofar as possible given the data available in the public domain), and the primary responsibility of Assad and his government and armed forces. It details, in particular, the environmental consequences of:
- a. the use of explosive weapons and the destruction of cities;
 - b. attacks on the oil industry;
 - c. damage to water supply and sanitation systems;
 - d. damage to waste management systems; and
 - e. conflict-related deforestation.

The use of explosive weapons and the destruction of cities

34. The image of a Syrian city razed to the ground is now a ubiquitous one. The destruction of these cities has led to the large scale accumulation of debris, otherwise known as ‘conflict rubble’.²⁹ To take one example, it was estimated in a 2017 study by the World Bank that approximately 14.9 and 5.3 million tons of debris would have accumulated in the cities of Aleppo and Homs respectively by that point.³⁰ The study seeks to put these figures in perspective by explaining that it would take about six years of continuous work and 26 million truck-kilometres to clear

²⁶ It is worth noting that many have cited environmental issues as a driver of the Syrian conflict, as well as a consequence. In short, it is said that human induced climate change contributed to extreme drought in Syria between 2006 and 2010, which in turn led to large-scale migration and socio-economic stresses which underpinned the war. To take some prolific examples, former US President Barack Obama stated in 2015 that “*it’s now believed that drought and crop failures and high food prices helped fuel the early unrest in Syria, which descended into civil war in the heart of the Middle East*” (available [here](#)). Staffan de Mistura, former UN Special Envoy for Syria between 2014 and 2018, has said that “*climate disruption was an amplifier and multiplier of the political crisis that was building up in Syria*” (available [here](#)).

²⁷ The World Bank Group, ‘Syria – Joint Damage Assessment of Selected Cities’, 1 December 2022 (available [here](#)), p.119.

²⁸ Ibid, p.21.

²⁹ PAX for Peace, ‘Amidst the debris: A desktop study on the environmental and public health impact of Syria’s conflict’, October 2015 (available [here](#)), pp.39 – 40.

³⁰ The World Bank Group, ‘The Toll of War: The Economic and Social Consequences of the Conflict in Syria’, 10 July 2017 (available [here](#)), p.27; see also Conflict and Environment Observatory, ‘Country brief: Syria’, 26 March 2018 (available [here](#)).



the debris in Aleppo. It would take about 2.5 years and 2.3 million truck-kilometres in Homs.³¹ These figures are likely to have increased since and, in any event, only relate to two cities.

35. Experts say that the existence of such debris is in itself an environmental and public health risk. It can contain a number of hazardous materials, such as asbestos, cement, heavy metals, domestic chemicals and combustion products.³² Moreover, the (hopeful) removal of that debris in due course poses further environmental risks, such as dust and carbon dioxide emissions.³³ With such quantities as there are in Syria, the risk only increases.
36. It has separately been noted that such rubble inevitably includes significant amounts of unexploded ordnance (“UXO”). UXO is produced where military munitions do not function as intended. The full extent of UXO in Syria is not yet known. However, the Head of the Programme and Coordination Unit at the UN Mine Action Service stated in a 2018 interview that there had been, on average, one instance of explosive weapon use in Syria every ten minutes since January 2015, and that one attack could include several bombs. Experts have applied a 10% failure rate for modern weapons and have understandably concluded that “*a considerable amount of [UXO] contamination must exist*”.³⁴
37. In addition to the obvious danger of explosion (the Landmine and Cluster Munition Monitor recorded 1,906 casualties in Syria from landmines and explosive remnants of war, although the true figure is thought to be significantly higher³⁵), buried UXO constitutes an environmental risk. Experts note that little research has been conducted into the non-anthropocentric environmental impacts of explosive violence³⁶ but that it is nonetheless likely to have a significant and long-term toll. They highlight that the chemicals from UXO can seep into soil

³¹ The World Bank Group, ‘The Toll of War’, 10 July 2017 (available [here](#)), p.27.

³² PAX for Peace, ‘Amidst the debris’, October 2015 (available [here](#)), p.33.

³³ The World Bank Group, ‘The Toll of War’, 10 July 2017 (available [here](#)), p.27.

³⁴ Action on Armed Violence, ‘The Reverberating Effects of Explosive Weapon Use in Syria’, January 2019, (available [here](#)), p.24.

³⁵ *Ibid*, p.24.

³⁶ *Ibid*, p.28.

and groundwater. Moreover, wildlife and livestock are both likely to be impacted by UXO (as well as other factors).

Attacks on the oil industry

38. Syria's oil industry has been the focus of sustained attack by all parties to the conflict.³⁷ Such attacks have formed part of strategies to impact the fuel supplies and resources of opponents.³⁸ This has resulted in significant damage to Syria's pre-conflict oil infrastructure, and there are expert reports of damage to oil refineries, pipelines, oil fields, oil infrastructure and oil storage sites from independent experts from as early as 2015.³⁹ One such study observes, for example, that one of Syria's two main oil refineries in Homs was attacked in both 2012 and 2013.⁴⁰
39. These attacks have resulted in a proliferation of makeshift oil refineries during the conflict in order to meet the need created by the destruction of formal refineries. An open-source investigation in 2020 estimated that 1,500 to 5,000 such refineries had at some point operated across northwestern Syria alone (although many have been forced out of service in recent years).⁴¹ A separate 2020 report stated that there were at least over 300 operational refineries in northeast Syria (although many had been closed down in 2017 due to ongoing community concerns about health and the environment).⁴²
40. Attacks on oil infrastructure, as well as the proliferation of makeshift oil refineries, have had both direct and indirect environmental consequences in Syria. In very broad terms, attacks can lead to oil spills and oil fires. Moreover, the makeshift refineries which have sprung up in response are also more susceptible than formal refineries to incidents such as oil spills and oil fires.⁴³ The makeshift refineries also give rise to a separate set of environmental and health concerns arising out of (i) the exposure to hazardous substances by those working on, or living near, these refineries, and (ii) poor mechanisms for oil waste storage.

³⁷ Conflict and Environment Observatory, 'Country Brief: Syria', 26 March 2018 (available [here](#)).

³⁸ To take one example, on 17 October 2014 Army General Lloyd J. Austin III, Commander of US Central Command, stated as follows: "*By striking these types of facilities, we reduce their ability to generate the funds and the fuel required to sustain their operations...and we are having the desired effects*" (see PAX for Peace, 'Amidst the debris', October 2015 (available [here](#)), p.24).

³⁹ PAX for Peace, 'Amidst the debris', October 2015 (available [here](#)), p.24.

⁴⁰ Ibid, pp.24 – 25.

⁴¹ Syria Direct, 'A ticking time bomb: Hellish work at northwestern Syria's makeshift oil refineries', 10 June 2022 (available [here](#)).

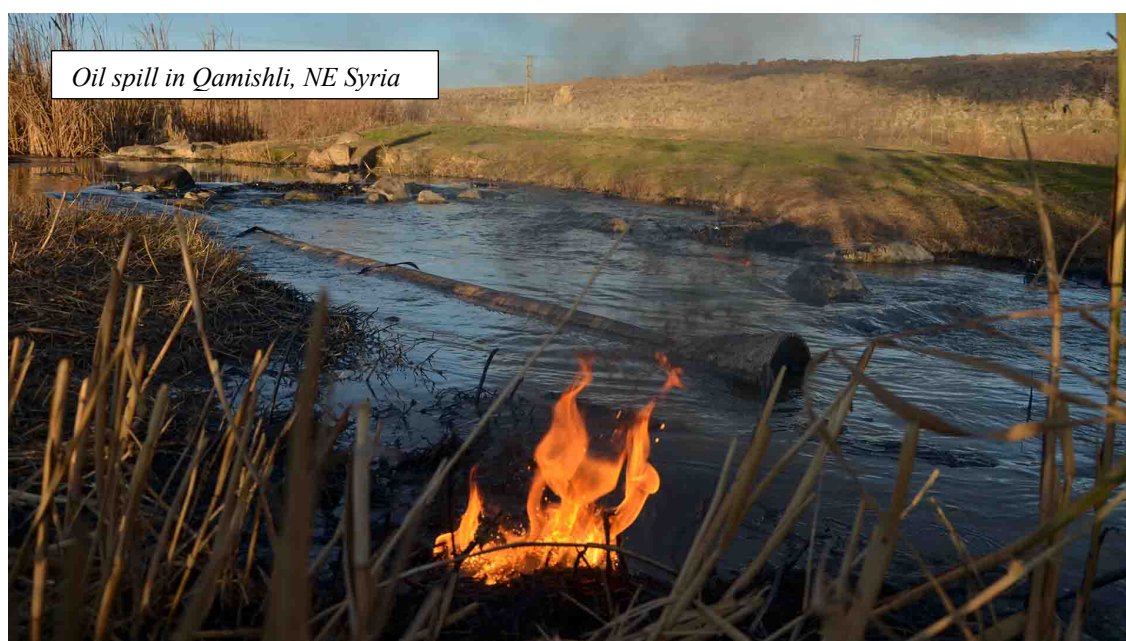
⁴² PAX for Peace, 'A River of Death: How oil pollution is impacting health and livelihoods in conflict-affected north-east Syria', June 2020 (available [here](#)), p.11.

⁴³ In broad terms, makeshift techniques transform crude oil into mazot, which is a low-quality type of diesel. However, the mazot extracted in makeshift refineries contains a large proportion of gas, which leads to explosions and fires. For further details see Syria Direct, 'A ticking time bomb: Hellish work at northwestern Syria's makeshift oil refineries', 10 June 2022 (available [here](#)).

41. This Report first sets out the available data on the environmental consequences of oil fires and spills in Syria (relating both to the direct attacks on pre-existing oil infrastructure and makeshift refineries). It then sets out the available data on the environmental hazards arising solely out of the proliferation of makeshift refineries as a result of the crisis.

Oil fires and oil spills in Syria: environmental consequences

42. It is clear that oil spills and oil fires, and the accompanying environmental risks indicated above, are rampant in Syria. Recent reports from 2020 have documented over 500 spills from oil facilities and extraction sites around the Rumeilan oil fields in northeast Syria alone.⁴⁴ It is separately reported that in the first five months of 2022, the Syrian Civil Defence (also known as the White Helmets) put out more than 550 fires in northwest Syria, around 10% of which had broken out at makeshift refineries and fuel stations.⁴⁵



43. One 2015 expert study explains the environmental hazards arising out of oil fires and oil spills in general terms. Oil fires arising out of attacks will result in air pollution by releasing harmful substances into the air such as sulphur dioxide, nitrogen dioxide, carbon monoxide, polycyclic aromatic hydrocarbons (“PAHS”), lead etc. The nitrogen and sulphur compounds are associated with acid rain, which can have a negative impact on vegetation and lead to the acidification of soils. Furthermore, these substances can cause severe short-term health effects, especially to people with pre-existing respiratory problems. The largescale release of PAHs can

⁴⁴ The World Bank Group, ‘Syria – Joint Damage Assessment of Selected Cities’, 1 December 2022 (available [here](#)), p.123.

⁴⁵ Syria Direct, ‘A ticking time bomb: Hellish work at northwestern Syria’s makeshift oil refineries’, 10 June 2022 (available [here](#)).

have a potentially severe long-term environmental impact. PAHs are very persistent organic compounds, some of which are potential carcinogens and can cause respiratory problems. When released by fires, they can be transported over a large area before deposition in soils.⁴⁶ Another study reports in the Syrian context that “*the pollution and fall out from oil fires have destroyed large areas of cultivated and grazing land and killed livestock, affecting livestock breeders and farmers.*”⁴⁷

44. Oil spills can often lead to air pollution, ground and surface water pollution, as well as soil pollution. The exact threat will depend on factors such as the quantity of oil spilled, the composition of that oil, and the age of the released oil products.⁴⁸
45. However, the 2015 expert study acknowledges that, at the time of writing, the extent of environmental damage from oil spills and fires in Syria was still unclear and that detailed studies and monitoring of air, water and soil had to be conducted to determine the levels of pollution and to assess the risks to the local population and their environment.⁴⁹ It does note that Syria’s heavy crude oil has a higher proportion of potentially noxious substances, such as heavy metals, than Iraq’s light crude oil. This means that Syria’s crude oil is a particularly problematic soil and water contaminant.⁵⁰
46. A 2020 study by the same expert organisation builds out the picture, although quantitative analysis is still somewhat hampered by the inability to gather detailed data. It considers the impact of oil pollution in north east Syria as a result of further deterioration to the large Gir Zero oil storage facility and states as follows:

“The impact of oil pollution on the soil and water sources on health and ecosystems can be long-term and far-reaching. There are several relevant factors for quantifying the risks, including the type of oil, the type of soil, local geological conditions, the groundwater level, and possible avenues of exposure to oil products for both people and livestock.

Crude oil and its by-products contain [PAHs], monocyclic aromatic hydrocarbons (“MAHs”), and heavy metals that are known human carcinogens. In order to determine the human health risk though, what is called in risk-assessments, the source-

⁴⁶ PAX for Peace, ‘Amidst the debris’, October 2015 (available [here](#)), p.23.

⁴⁷ Arab Reform Initiative, ‘The Environmental Impact of Syria’s Conflict: A Preliminary Survey of Issues’, 7 April 2021 (available [here](#)).

⁴⁸ PAX for Peace, ‘Amidst the debris’, October 2015 (available [here](#)).

⁴⁹ Ibid, p.25.

⁵⁰ Ibid, p.24.

*pathway-receptor, detailed information is needed on the specific environmental conditions and oil characteristics. The health of people living nearby can be affected through ingestion, inhalation or skin contact with oil and oil waste products in the water, soil and air. In particular, the continuous flow of oil over the last several years in this area risks contaminating groundwater sources, which are also used for drinking water as every town and village is using water wells. Communities also have livestock such as sheep and goats that eat the vegetation and drink the water, and as such, are at risk of contamination and forming an exposure pathway for people from consumption of dairy products and meat. At the time of writing, specific information on the type and level of groundwater and locations of wells is not available, but this should be included in any future risk assessment.*⁵¹

47. The authors of that report also considered interviews with local residents about the oil spills and dumping of waste in that area, finding that “*a disturbing picture emerges of desperate people living in a toxic and polluted environment but with no place to go*”.⁵² The population expressed worries about the health and environmental effects of the situation.⁵³ The report takes the example of 35 year old teacher who lives in the town of Tal Mashan. The agricultural area east of the village was hit with oil spills. He explained as follows to those interviewing him:

“He tells us how pollution has always been an issue in this area, but that over the last two years the situation has worsened due to contaminated water from the Gir Zero facility. Heavy rainfall flooded the land with oil waste, rendering the harvest in these years useless. The flooding can spread oil as far as one kilometre from the river’s banks. His wife fears illnesses from the pollution; the couple has already had many miscarriages and knew of other miscarriages in the villages too, which they think are connected with the pollution. Locals have begun referring to the Wadi Rumeila river as the ‘River of Death’, a reference to the health issues its contaminated waters are suspected of causing in the more than 30 villages it runs through.”

48. In some regions of Syria, desperate civilians have sought to take advantage of such spills and leaks to acquire fuel for heating purposes. Experts observe that the uncontrolled burning of crude oil for domestic purposes will have led to the release of further pollutants as well as health

⁵¹ PAX for Peace, ‘A River of Death’, June 2020 (available [here](#)), p.7.

⁵² Ibid, p.19.

⁵³ Ibid, p.21.

issues. The latter can be identified by an increasing number of skin and respiratory diseases in areas where crude oil has been stolen.⁵⁴

Makeshift refineries: further environmental and health consequences

49. Makeshift oil refineries damage the environment through oil spills and fires, as detailed above. They also give rise to a separate set of environmental and health concerns arising out of (i) the exposure to hazardous substances by those working on, or living near, these refineries, and (ii) poor mechanisms for oil waste storage.
50. A 2021 expert report summarises the health concerns as follows: *“People working and living near oil facilities face exposure to air, water and soil pollution through various pathways that can cause acute and long-term harm to human health, ranging from respiratory and skin problems to carcinogenic and genotoxic effects, damaged organs and psychological impacts.”*⁵⁵
51. This accords with first-hand accounts. Work in these makeshift refineries is *“hellish”*.⁵⁶ One doctor treating refinery workers in the area of Dier ez-Zor observed in 2014 that common ailments included persistent coughs and chemical burns that had the potential to lead to tumours.⁵⁷ It is moreover reported that the gases can cause heavy damage to the eye’s cornea and results in some workers becoming blind.⁵⁸
52. The doctor considered that those living in the immediate region were increasingly at risk of developing cancer.⁵⁹ There are also accounts of young children living in the areas around refineries being hospitalised for breathing problems. One paediatrician speaking in 2022 explained that *“[hospitalisation] rates are higher in areas surrounding the burners and due to the higher prevalence of respiratory diseases in children – asthma attacks, bronchiolitis – in addition to skin diseases and severe skin rashes that resist normal treatment...Most of the cases treated at [my hospital] in 2019 were caused by the burners and by the use of charcoal produced at the makeshift refineries for heating.”*⁶⁰

⁵⁴ PAX for Peace, ‘Amidst the debris’, October 2015 (available [here](#)), p.24.

⁵⁵ PAX for Peace, ‘War, Waste, and Polluted Pastures: An Explorative Environmental Study of the Impact of the Conflict in north-east Syria’, May 2021, p.21.

⁵⁶ Syria Direct, ‘A ticking time bomb: Hellish work at northwestern Syria’s makeshift oil refineries’, 10 June 2022 (available [here](#)).

⁵⁷ VICE, ‘Syria’s Illegal Oil Wells’, 21 January 2014 (available [here](#)).

⁵⁸ Syria Direct, ‘A ticking time bomb: Hellish work at northwestern Syria’s makeshift oil refineries’, 10 June 2022 (available [here](#)).

⁵⁹ VICE, ‘Syria’s Illegal Oil Wells’, 21 January 2014 (available [here](#)).

⁶⁰ Syria Direct, ‘A ticking time bomb: Hellish work at northwestern Syria’s makeshift oil refineries’, 10 June 2022 (available [here](#)).

53. The storage of oil waste from these refineries is separately described as a “*huge problem*” in the same 2021 expert report referenced at paragraph 45 above.⁶¹ A lack of proper processing and storage facilities for the waste has led to it being stored in open-air waste pits, which it is reported will pose long-term risks for groundwater and surface water sources, as well as for wildlife. Other by-products are collected in large reservoirs or “*just dumped*” into local creeks. This is already polluting hundreds of kilometres of rivers and creeks, and affecting groundwater. It poses environmental and health risks for local communities, livestock and wildlife.⁶²

Damage to water supply and sanitation systems

54. The conflict in Syria has intensified existing problems with water supply and sanitation in Syria. Whilst Syria is not technically a water scarce country, a combination of drought, poor governance and highly inefficient flood irrigation meant that the country had always suffered somewhat. However, these issues were, at least in relative terms, limited. Before 2010, 98% of people in cities and 92% of people in rural communities had reliable access to safe water.⁶³

55. The current position is starkly different. It is perhaps best shown through comparing the extent of water production before and during the conflict. Official Ministry of Water Resources statistics indicate that water production dropped from 1,700 million m³/year in 2010 to 600 million m³/year in 2021. The water share per capita per day in urban areas decreased from 125 to 60 litres per day from 2010 to 2021, and in rural areas it decreased from 80 litres to 30 litres per day from 2010 to 2021.⁶⁴

56. The extent of the issue has been widely reported on by UN Agencies, local NGOs and analysts throughout the conflict. To take some examples:

- a. The World Health Organisation reported in 2015 that Syria’s water supply infrastructure had been destroyed and the availability of safe water within Syria was at one third of pre-crisis levels.⁶⁵
- b. The World Bank assessed the physical damage to 457 water supply and sanitation infrastructure assets across eight governorates in 2017. It found that nearly two thirds of

⁶¹ PAX for Peace, ‘War, Waste, and Polluted Pastures’, May 2021, p.27.

⁶² Ibid, p.28.

⁶³ International Committee of the Red Cross, ‘Syria Water Crisis: Up to 40% less drinking water after 10 years of conflict’, 1 October 2021 (available [here](#)).

⁶⁴ Middle East Directions, ‘Water Scarcity, Mismanagement and Pollution in Syria’ 27 June 2022 (available [here](#)), p.12.

⁶⁵ World Health Organisation, ‘Millions of Syrians endure deteriorating health crisis: WHO calls for increased funding’, 27 March 2015 (available [here](#)).

the water treatment plants, half of the pumping stations, a third of the water towers, a quarter of the sewage treatment plants, and a sixth of the wells have been destroyed or partially damaged across Syria. The damage varied across regions. For example, almost all of the infrastructure in Raqqa was still damaged in 2017 but, by contrast, there had been extensive reconstruction efforts in Kobani following the liberation of the city from ISIS control.⁶⁶

- c. The International Committee of the Red Cross (the “ICRC”) reported in 2021 that only 50% of water and sanitation systems function properly across Syria.⁶⁷
- d. A 2022 research report from Middle East Directions observed that approximately 40% of the sewage network was damaged in the city of Deir al-Zor, resulting in a drop in access to water of around 40%. At the national level, 70% of sewage in Syria is being discharged untreated and no less than half of the sewerage systems are out of order.⁶⁸

57. There are also many qualitative reports of disruption to sanitation and supply services. To take some further examples, it is said that the wastewater treatment plants serving Damascus and Aleppo were rendered inoperable



in 2012 as a result of direct destruction.⁶⁹ The ICRC estimates that the combined impact of damage to wastewater treatment plants around Aleppo and Damascus is estimated to have affected 3.4 million people in 2015.⁷⁰ Damage to a water pumping station in Deir ez-Zor in

⁶⁶ The World Bank Group, ‘The Toll of War’, 10 July 2017 (available [here](#)), p.29.

⁶⁷ International Committee of the Red Cross, ‘Syria Water Crisis: Up to 40% less drinking water after 10 years of conflict’, 1 October 2021 (available [here](#)).

⁶⁸ Middle East Directions, ‘Water Scarcity, Mismanagement and Pollution in Syria’ 27 June 2022 (available [here](#)), p.12.

⁶⁹ Action on Armed Violence, ‘The Reverberating Effects of Explosive Weapon Use in Syria’, January 2019, (available [here](#)), p.26.

⁷⁰ International Committee of the Red Cross, ‘Bled dry – How war in the Middle East is bringing the region to the

November 2015 reportedly deprived 100,000 people of water.⁷¹ There are UNICEF reports of sewage floods in 2016, which led to people's homes in Damascus being flooded with sewage.⁷²

58. The overall message is clear: the conflict has significantly impacted water supply and sanitation in Syria. The exact conflict-related triggers for this are many and various. Direct damage to physical infrastructure (as identified by the World Bank's 2017 study) is one cause. There are numerous reports of the conscious use of water as a "*weapon of war*": Hanaa Singer, UNICEF Syria representative said in 2016 that "*water has been used as a weapon of war by all parties to the conflict...Water sources have been deliberately shut off, water infrastructure has been attacked and damaged, and water workers were denied access to maintain, repair and operate water networks*".⁷³ The UN documented 30 such tactics in Damascus, Aleppo, Hama, Raqqa and Dara'a in 2016.
59. The conflict has also indirectly affected the provision of water-related services. It has led to an inability to maintain that infrastructure which has not directly damaged as a result of war. In addition, because water is pumped using electricity, many have observed that decreases in Syria's power supply have had a knock on effect on water-related services.⁷⁴
60. Much of the reporting to date has understandably concentrated on the immediate public health implications. Civilians without access to clean drinking water are at increased risk of waterborne diseases and there are numerous reports regarding NGO efforts to, for example, mitigate against cholera outbreaks in different Syrian governorates.⁷⁵ Kidney infections, typhoid and salmonella have been reported in Aleppo.
61. That said, the environmental implications of the Syrian water crisis are starting to receive more attention. The failure of water sanitation processes means that wastewater seeps into the ground and contaminates the groundwater. As wastewater treatment works in Syria are often sited close to water supply infrastructure, this in turn impacts public health by contaminating drinking water supplies. Further expert research on the environmental consequences of water supply and sanitation issues in Syria is required.

brink of a water catastrophe', 25 March 2015 (available [here](#)), p.15.

⁷¹ UNIDIR, 'The Implications of the Reverberating Effects of Explosive Weapons Use on Populated Areas for Implementing the Sustainable Development Goals', 2016 (available [here](#)), p.11.

⁷² UNICEF, 'In Damascus, water cuts and crumbling sewage systems pose serious health risks', 13 April 2017 (available [here](#)).

⁷³ Ibid.

⁷⁴ See, for example, Action on Armed Violence, 'The Reverberating Effects of Explosive Weapon Use in Syria', January 2019, (available [here](#)), p.26.

⁷⁵ See, for example, various UNICEF reports regarding cholera outbreaks ([here](#) and [here](#)).

Damage to waste management systems

62. Waste management was already a concern within Syria. In short, in pre-conflict Syria the majority of waste was collected but not appropriately disposed of. Open-air landfills on the outskirts of towns, together with a common practice of open-air incineration, contributed to both air and ground pollution. Moreover, a failure to separate hazardous and non-hazardous waste meant that, whilst the former only constituted about 1 – 3% of the total volume of waste, inadequate handling meant that it was one of the most significant sources of air pollution.⁷⁶
63. The conflict has generated new waste-related issues and exacerbated the existing ones, with accompanying environmental consequences.
64. First, the conflict has resulted in the generation of a greater amount of waste. It is estimated that the daily production of waste has doubled during the war and reaches approximately 850 tons per day.⁷⁷ Experts suggest that a greater proportion of this waste will be hazardous than before as there will have been a disproportionate increase in healthcare waste.⁷⁸ This is corroborated by calculations from the World Bank in 2022 regarding the amount of electronic waste generated by destroyed and damaged healthcare facilities.⁷⁹



65. The increase in waste is coupled with a decreased ability to manage that waste. Large quantities of waste simply remain in the streets, notably in Aleppo, Homs, Hama, and various neighbourhoods in Damascus.⁸⁰ It is also noted that the destruction brought about by the conflict

⁷⁶ PAX for Peace, 'Amidst the debris', October 2015 (available [here](#)), p.20.

⁷⁷ Arab Reform Initiative, 'The Environmental Impact of Syria's Conflict: A Preliminary Survey of Issues', 7 April 2021 (available [here](#)).

⁷⁸ PAX for Peace, 'Amidst the debris', October 2015 (available [here](#)), p.38.

⁷⁹ The World Bank Group, 'Syria – Joint Damage Assessment of Selected Cities', 1 December 2022 (available [here](#)), p.120.

⁸⁰ PAX for Peace, 'Amidst the debris', October 2015 (available [here](#)), p.38.

has increased the use of informal waste dumping sites and the “*random burning of waste*” across Syria.⁸¹ To take some specific examples, the World Bank reported in 2022 that around four neighbourhoods in Western Aleppo and 36 neighbourhoods in Eastern Aleppo had no waste collection in 2014 and that this led to informal dumping. Moreover, since 2014, the city of Al Hakasah has had eight unapproved and informal dumpsites and landfills.⁸² The largest decline in the number of refuse collection workers occurred in the cities of Al Hasakah (67% decline), Raqqa (65% decline) and Dar’a (51% decline). Raqqa, Dar’a and Deir ez-Zor lost many of their refuse collection vehicles.⁸³

66. There have been reports of local civilian activist networks seeking to improve the situation in their towns and cities. These efforts have been routinely hampered by the fighting and a lack of resources. A local activist in Homs said in 2013 that: “*We collect all the trash in one place until there is a heap as big as a mountain...Once or twice a week, we’d get a truck and move it outside. It’s dangerous, though, because you have to pass checkpoints, and the soldiers often accuse us of smuggling weapons inside...Sometimes people have been arrested, and sometimes they have forced us to unload everything.*” He also said that when the army has sealed off certain districts on occasion, activists cannot take out the waste for weeks. In such circumstances they bury it in the ground because “*there is nothing else [they] can do*”.⁸⁴
67. Another activist in the Idlib governorate expands upon the resource-related issues with waste management: “*We’ve tried to solve this problem, but it’s still bad... You can find volunteers to collect the trash for one day or two, but not every day, and we don’t have funds to pay salaries.*” Moreover, trucks and fuel to transport the waste are expensive and not always available. The activist said: “*It’s a big town, so you need at least three vehicles if you want to clear the streets, but sometimes we can find only one.*”⁸⁵
68. Attention has been paid to the public health implications of this failure to manage waste in Syria; there are anecdotal references to increased cases of leishmaniasis and the World Health Organisation observed as early as 2013 that “*waste accumulations in streets are breeding sites for pests such as mosquitos, flies and mice that could transmit many diseases such as*

⁸¹ Action on Armed Violence, ‘The Reverberating Effects of Explosive Weapon Use in Syria’, January 2019, (available [here](#)), p.28.

⁸² The World Bank Group, ‘Syria – Joint Damage Assessment of Selected Cities’, 1 December 2022 (available [here](#)), p.108.

⁸³ Ibid, p.104.

⁸⁴ The New Humanitarian, ‘Clearing rubbish in Syria: A life-saving – and life-threatening – job’, 2 July 2013 (available [here](#)).

⁸⁵ Ibid.

*leishmaniasis, causing epidemics and outbreaks, particularly in emergency and conflict situations.*⁸⁶

69. Analysts have started to comment on the environmental consequences of the failure to manage waste in Syria (but there is more to be done). A 2015 report sets out the issues with waste management that Syria has suffered during the conflict and then states in general terms:

“The failure to collect and adequately dispose of waste can lead to serious air, soil and water contamination and health hazards. Uncontrolled waste burning releases smoke, soot and contaminants such as dioxins and furans. Air pollution can also be generated by ash and dust from the landfill surface and gas emissions from the decay of waste, such as methane and carbon dioxide. The smoke from landfill fires, which can be fuelled by materials such as wood, paper and plastics in the waste, and methane released by breakdown, can also contain high levels of PAHs, phenols, benzene and heavy metals. These forms of air pollution can create serious health hazards, triggering respiratory problems, and on a longer term cause asphyxiation symptoms, chronic diseases and cancer. Young children, pregnant women, and old and ill people may be especially sensitive to exposures.

*The creation and mobilisation of landfill leachate, which is generated from the humidity of the waste and from rainwater percolating through it, can cause groundwater pollution. Leachate can contain heavy metals and high levels of organic and inorganic substances, and escape into surrounding drainage structures and open water bodies. It negatively affects water quality by consuming free oxygen in water, which can have serious consequences for ecosystems. Depending on the organic and inorganic substances in the landfill, and whether the landfill has been constructed with an impermeable barrier beneath it, underlying and surrounding soil can be contaminated, although this is often limited to the surrounding area.*⁸⁷

Conflict-related deforestation

70. Forests make up a small but ecologically important portion of Syria’s landscape: the World Bank reports that they covered approximately 3.2% of Syria before the conflict.⁸⁸

⁸⁶ The New Humanitarian, ‘Clearing rubbish in Syria: A life-saving – and life-threatening – job’, 2 July 2013 (available [here](#)).

⁸⁷ PAX for Peace, ‘Amidst the debris’, October 2015 (available [here](#)), pp.37-38.

⁸⁸ The World Bank Group, ‘Syria – Joint Damage Assessment of Selected Cities’, 1 December 2022 (available [here](#)), p.122 – 123.

71. Numerous assessments report that the conflict has led to significant deforestation in Syria's natural forests and reserves.⁸⁹ One 2023 report describes the extent of deforestation and tree-cover loss as an “*alarming loss*”.⁹⁰ That same report developed a model to estimate the extent of deforestation in different areas within Syria. It notes, for example, that the governorates of Latakia, Hama, Homs and Idlib in Western Syria had tree-cover loss of over 36% between the period 2011 – 2021.⁹¹

72. The conflict-related reasons for deforestation are many and various, and differ between regions. The 2023 report goes on to identify the main drivers connecting the Syrian conflict both directly and indirectly to deforestation and tree-loss cover.

73. *Need for firewood:* Lack of access to fuel and rising energy prices resulted in a massive market for firewood for domestic purposes such as heating and cooking.⁹² Increased demand, together with a lack of enforcement of local environmental regulations, meant that civilians, criminal



Trees cut by criminal gangs in As-Suwayda

groups, and militias were able to cut down forested areas in order to sell the wood for profit. There are various reports of such activities in Western Syria; the 2023 report explains that fuel prices prompted logging in the governorates of Latakia and Tartus. Similar activities were documented in rebel-held areas such as Idlib and

Aleppo.

74. *Charcoal production:* Relatedly, the conflict has led to significant numbers of trees being cut down in order to produce charcoal. Whilst some of Syria's charcoal comes from Turkey via humanitarian aid, the majority is from Syria's forests. These have become home to thousands of licensed and unlicensed charcoal production sites: it is reported that since the start of the conflict the governorates of Latakia and Tartous have issued at least 873 and 650 charcoal

⁸⁹ See, for example, PAX for Peace, ‘Axed & Burned: How Conflict-caused Deforestation Impacts Environmental, Socio-economic and Climate Resilience in Syria’, March 2023 (available [here](#)).

⁹⁰ Ibid, p.5.

⁹¹ Ibid, p.19. See also pp.17 – 22 for a more detailed description of tree loss cover in different regions of Syria and the specific reasons behind this.

⁹² This is clear from the increasing cost of firewood, even taking into account the near total devaluation of the Syrian pound. Prior to the conflict, one ton of firewood cost roughly 6,000 Syrian pounds (SYP). This steadily increased to SYP 20,000 in 2014 and SYP 100,000 in 2018. In 2022, prices were reported to be between SYP 900,000 and SYP 1 million.

production licences respectively. The production of charcoal is worth an estimated USD 1 million in Latakia alone.

75. It is understandable that charcoal has emerged during the conflict as a primary source of fuel. This is against a background of rising energy prices and a country where 90% of the population live below the poverty line. The 2023 report highlights that charcoal is often the only financially viable source of heat for hundreds of thousands of Syrians in informal settlements throughout the country (as it is approximately one quarter of the cost of traditional fuel produced in refineries).

76. *Forest fires*: There has been a notable increase in the annual average area burned in forests during the conflict. Taking the example of Latakia again, it is reported that the average area burned increased by a factor of more than 5.7 in the period 2011 – 2015 compared with pre-conflict levels between 2002 – 2010. Numbers dropped between 2016



and 2019, but then increased again in 2020. This is reportedly more than a 30-fold increase over pre-war levels for Latakia alone.

77. *Lack of governance*: The conflict has led to decreased monitoring and enforcement of forest regulations (an issue about which the UN Food and Agricultural Organisation had already raised concerns before the war).⁹³ This absence of oversight has led to increased deforestation in a number of ways. Firstly, individuals have been able to take the opportunity and reallocate forest land for their own agricultural use. Secondly, a lack of resources for forest management has led to a decrease in ability to manage and contain forest wildfires because of a lack of equipment and/or relevant expertise. Thirdly, there has been a decrease in planting operations.

78. *Military operations*: Fighting in forest areas is a major cause of deforestation, and has been particularly reported in Idlib, Latakia, Hama and Homs. Rebel groups used forest cover when setting up camps, which led the Syrian regime (supported by the Russian air force) to undertake strikes both by aircraft and ground systems. The 2023 report references one documented use of

⁹³ See, for example, PAX for Peace, ‘Axed & Burned’, March 2023 (available [here](#)), p.37.

a TOS-1 thermobaric launcher in Hama in October 2015 which gave rise to widespread burned forests. Moreover, that particular area was later the site of severe logging. Aside from direct destruction by military action, the 2023 report highlights that (i) troops have burned and cut down trees to clear firing lines, and (ii) forests have been cleared to set up military outposts.

79. *Internally displaced persons (“IDPs”)*: There are an estimated 6.8 million displaced persons within Syria, which is the largest number of IDPs in the world.⁹⁴ The humanitarian consequences of this have been reported on widely. From a purely environmental perspective, the creation of formal and informal settlements for this large number of IDPs is another cause of the deforestation and tree-cover loss discussed above. The example of IDP camps in Idlib and Aleppo is indicative. A 2022 study by the Assistance Coordination Unit found 598 camps within 26 clusters in Idlib and Aleppo, hosting nearly 830,000 IDPs. Often these IDPs had found shelter under orchard trees, but in other areas, orchards and natural forests had been cut down to make place for larger official IDP camps or informal settlements.⁹⁵
80. This conflict-driven deforestation is an environmental problem in and of itself, as well as giving rise to a host of further environmental issues. This Report sets out the existing analysis on four particular consequences of deforestation in the Syrian context: (i) soil erosion, (ii) decrease in water quality, (iii) increased risks of flooding, and (iv) reduction in biodiversity. However, as experts have acknowledged, deforestation in Syria will undoubtedly have further impacts that still need to be explored.⁹⁶
81. *Soil erosion*: Syria’s climate of long dry periods followed by intense rainfall means that its soils are naturally erosion prone. Syria also has an increasing propensity for severe droughts given climate change. Deforestation further increases that erosion by removing soil-stabilising vegetation cover. Experts note that increases in soil erosion of 200-800% have been observed in Syria after wildfires. Moreover, in general terms, Mediterranean climates have very slow rates of soil formation and recovery after a disturbance. This further exacerbates and lengthens the impacts of soil loss.⁹⁷
82. *Water quality*: Experts acknowledge that the contribution of conflict-driven deforestation on water quality in Syria has not yet been studied in sufficient detail. That said, some preliminary observations can still be made. Poor water quality was already a problem in pre-conflict Syria and has worsened since the eruption of violence. Some studies estimate that every 1% increase

⁹⁴ UNHCR, ‘Syria: UNHCR Operational Update’, May 2023 (available [here](#)).

⁹⁵ See, for example, PAX for Peace, ‘Axed & Burned’, March 2023 (available [here](#)), p.22.

⁹⁶ *Ibid.*

⁹⁷ *Ibid.*, p.23.

in deforestation equates to a 0.93% decrease in clean drinking water, meaning that such significant levels of deforestation in Syria will be further contributing to the water scarcity crisis in Syria.⁹⁸

83. *Flooding*: Deforestation can lead to a greater propensity for severe flooding (where the loss of soil decreases groundwater recharge and so increases the surface flow of rainfall). Given that Syria is home to vulnerable displaced settlements which rely on temporary dwellings and structures, the impact of such floods are likely to be particularly devastating. One example of this was in 2021 where severe floods injured three displaced people, took the life of one, and impacted more than 142,000 others in camps for IDPs along the Syrian-Turkish border.⁹⁹
84. *Biodiversity*: Large-scale deforestation has affected Syria's biodiversity. A 2016 biodiversity status report issued by Syria expressed concerns about the significant clearing and destruction of 11 of Syria's forested reserves.¹⁰⁰ Various media reports have observed that particular species are either no longer sighted or are in serious decline. To take some examples, since the outbreak of the conflict, there have been no more sightings of the bald ibis previously seen in Palmyra. Others species such as long-legged wading birds, sociable lapwings, the Arabian ostrich and the Syrian brown bear also appear to be in danger.¹⁰¹



⁹⁸ Ibid, p.23.

⁹⁹ Ibid, p.24.

¹⁰⁰ Ibid, p.24.

¹⁰¹ The World Bank Group, 'Syria – Joint Damage Assessment of Selected Cities', 1 December 2022 (available [here](#)), p.123.

D. CONCLUDING COMMENTS AND RECOMMENDATIONS

Concluding comments

85. As set out in this Report, the long running conflict in Syria has unleashed, and continues to unleash, devastating environmental and humanitarian consequences both within Syria and more widely. The full extent of the conflict on Syria's environment cannot yet be known but it is no exaggeration to describe it as catastrophic. As the evidence shows, Assad, his government and armed forces bear primary responsibility for these egregious violations. They should be investigated and held to account for their actions. They certainly should not be invited to and welcomed at COP28.
86. Unlike Syria, the UAE is a part of global discussions on the reduction of emissions and the urgent efforts to halt the dangerous consequences of climate change. However, the UAE's insistence on inviting Assad to COP28 despite his appalling human rights and environmental record should not be permitted. There are well-founded concerns that the UAE will use its unique position as host to prop up Assad, assist with his 'greenwashing' campaign, and seek to facilitate his re-emergence on the world stage.
87. These are all imperative concerns with which States should address in order to ensure that another COP is not lost and misused. Put simply, the world does not have the time to waste.

Recommendations

88. **First, States are urged to take all diplomatic measures to ensure that Bashar Al Assad's invitation to COP28 is rescinded.** Syria cannot be permitted to use this conference as a way of re-establishing itself on the international stage. The Syrian conflict continues to cause an unprecedented environmental crisis, and it would be profoundly hypocritical for Assad to be involved in climate talks whilst this is ongoing. Given that Syria is not complying at all with global environmental goals, it might also try and advocate for dangerously less stringent policies.
89. **Second, the UAE should not assist Bashar Al Assad by inviting him to COP28 to restore his international image.** States should directly engage the UAE to withdraw Assad's invitation and prevent him from using COP28 for his own ends. Given the particular concern that the UAE is assisting Assad to be welcomed back into the international fold, it is crucial that the UAE as the host is thwarted in these efforts.

90. **Third, States should ensure that COP28 addresses the mass environmental violations committed by Bashar Al Assad and his armed forces.** It is essential that these widespread crimes are highlighted and that those responsible are held to account by the appropriate bodies. Instead of COP28 being a platform for Assad to seek to cleanse his reputation, it should be a time to expose the truth and seek accountability and remedial action.
91. **Fourth, States should also encourage the UAE to re-examine its proposed expansion of oil and gas production.** COP28 presents a unique opportunity to implore the UAE to adopt a sustainable plan in respect of fossil fuels with the input and assistance of, for example, IPCC experts. The UAE should be urged to re-examine these plans and liaise with subject matter experts to ensure that they are capable of achieving the UAE's proposed targets.
92. It is hoped that this Report will serve to draw attention to the suffering that the Syrian people continue to endure, and the steps that can be taken to prevent the perpetrators from being resurrected at COP28 through the UAE's invitation, without any consequences. That would set a precarious precedent for a serial violator of the environment to be welcomed to the world's leading summit on protecting the environment. It would be a contradiction in terms.

ABOUT THE AUTHOR

Judge Sir Howard Morrison KCMG, CBE, KC has had a highly distinguished legal career both in the United Kingdom and internationally.

He was a Judge of the International Criminal Court (ICC) from 2011 to 2021 where he served as President of the Appeals Division. Prior to that, he sat as one of the trial Judges at the International Criminal Tribunal for the former Yugoslavia (ICTY) from 2009 to 2016, including in the landmark case of Radovan Karadžić.

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From 1998 until 2004, Sir Howard served as defence counsel in trials before both the ICTY and the International Criminal Tribunal for Rwanda (ICTR). He was then appointed a Circuit Judge in the UK in 2004. He became senior Judge of the Sovereign Base Areas of Cyprus in 2008. He is also called to the Bars of Fiji and the Eastern Caribbean Supreme Court.

Sir Howard was appointed in turn OBE, CBE and KCMG by HM Queen Elizabeth II. He is a Senior Fellow of the Lauterpacht Centre of Cambridge University, Hon Professor of Law at Leicester University and Visiting Professor at Northumbria University. He has been a visiting lecturer at some 25 universities in the UK, Holland, Italy, Australia, the USA, China and the Middle East.

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NOVEMBER 8TH 2023