ENVIRON-MENTAL INJUSTICE IN SYRIA

HOW THE WAR IS DISPROPORTIONATELY AFFECTING VULNERABLE COMMUNITIES

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1. INTRODUCTION

The armed conflict in Syria, which began in **2011**, has had **devastating effects** on the country's population. The war has caused **immense suffering,** with over 6 million Syrians fleeing the country and 6.7 million internally displaced. The **economic crisis** that began with the **conflict** and worsened due to **several factors,** including US sanctions, COVID-19, and the financial collapse of neighbouring Lebanon, has left an estimated 14.6 million people in need of humanitarian assistance. In addition to these challenges, Syria is also facing significant **environmental risks** that were worsened by the effects of both **war** and **climate change.** These issues include, but are not limited to desertification, droughts, biodiversity loss, wildfires, aquifer depletion, deforestation, and soil erosion.[1]

The **environmental risks in Syria** disproportionately affect vulnerable communities and exacerbate their suffering, resulting in **environmental injustice.** Environmental injustice in general is the unequal distribution of environmental risks and impacts on marginalized communities. In the Syrian context, vulnerable communities, including **women, children, and internally displaced people (IDPs),** are more exposed to environmental degradation due to their limited resources and access to basic services, such as safe drinking water and sanitation facilities.[2,3]

The **implications of environmental injustice on human rights and well-being in Syria** are significant. The lack of access to safe drinking water and sanitation facilities exposes communities to waterborne diseases, while drought conditions affect food and nutrition security. Environmental degradation also contributes to negative coping mechanisms, such as child labour and early child marriage, further compromising human rights and well-being.[2]

According to a report by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) in 2022, the conflict in Syria has led to severe environmental damage, including contamination of water sources, destruction of agricultural land, and pollution from weapons and other military activities. This report highlights that the conflict has disproportionately affected vulnerable communities, **particularly those in rural areas,** who are heavily dependent on agriculture for their livelihoods.[2,4]

Furthermore, the **displacement of people** due to the conflict has resulted in overcrowding and inadequate access to basic services, exacerbating the environmental risks faced by these communities. The World Health Organization (WHO) has reported an increase in the incidence of waterborne diseases in areas affected by the conflict, highlighting the significant environmental health risks faced by vulnerable populations.[4]

The urgent need for action to address environmental injustice in Syria cannot be overstated. Such action requires **policy changes** and implementation at both **local and international levels.** Governments and humanitarian organizations must prioritize access to food, safe drinking water, sanitation facilities, and healthcare services. **Long-term solutions** are also needed to address **the root causes of environmental degradation,** such as deforestation and aquifer depletion. By taking urgent and comprehensive action, we can **ensure that vulnerable communities in Syria are not left behind in the global fight for environmental justice.**

2. PROJECT FRAMEWORK

At the time of publication of this report, the Syrian war and its devastating effects have been impacting and transforming the region and the entire world for 12 years.

Although it is increasingly becoming less visible in the eyes of the Global North, the international community has focused on the political and economic size of the conflict, while the **environmental reality of the war has been systematically forgotten.**

The climate emergency, the destruction of natural environments, and the lack of access to resources have been and are decisive factors to understand Syrian's conflict origins and worsening. Moreover, it is the local, displaced, and refugee communities that suffer the most from its consequences.

Despite the correlation between war, environmental conflict, and human rights violations, there is a lack of scientific evidence on environmental injustice and conflict in Syria. In the framework of the project "ASÎTÎ: Fostering the role of internally displaced and refugee youth from the long-term conflicts in Syria and the KRI and youth from host communities in Jordan and Catalonia in peacebuilding and the consolidation of democracy and human rights in the Middle East ", funded by the Catalan Agency for Development Cooperation (ACCD) and coordinated by NGOs ***NOVACT - Institut Internacional per l'Acció No violenta (NOVACT)*** and ***Fundació Autònoma Solidària (FAS)***; activists and experts from Syria and Kurdistan have worked to advance research on how the Syrian war and its social, political and environmental impacts affect - in an intersectional way - the most vulnerable populations.

In alliance with ***Institut de Ciència i Tecnologia Ambientals (ICTA-UAB)*** and ***Centre de Recerca Ecològica i Aplicacions Forestals (CREAF)*** research centres of the ***Autonomous University of Barcelona (UAB)***, this report collects ten specific cases of environmental injustice in Syria. It is designed in an accessible format so that global justice organizations as well as students, and educational and research centres can learn more about the subject. Its content is complementary to publications made in ***EJAtlas - Global Atlas of Environmental Justice.***

Conducted by researchers from communities directly affected by this conflict, this work has been possible thanks to the cooperation between public administration, universities, and civil society organizations. Above all, though, it has been possible thanks to the dedication and experience of women who, despite multiple obstacles, persevere in **science** and **activism** as **tools for feminist transformation and human rights.**

3. OBJECTIVES AND METHODOLOGY

This research is part of the ASÎTÎ project, a collaboration between Fundació Autònoma Solidària (FAS) at the Universitat Autònoma de Barcelona (UAB) and the Institut de Ciència i Tecnologia Ambientals (ICTA). This project aims to understand the environmental dimensions of the conflict in Syria, investigating the complex interrelationships between environmental conflict, sociopolitical conflict, and forced population displacement. Over six months, we focused on identifying, locating, and documenting case studies related to environmental justice in Syria, directly or indirectly linked to the ongoing war. Our case studies were reviewed and moderated by ICTA-UAB researchers for accuracy and added to the Environmental Justice Atlas.

To gather information, we collaborated with local communities and conducted online interviews with individuals from affected communities, activists, and members of NGOs, such as “Green Bridges,” “PAX for Peace,” and the “Human Rights Organization in Afrin/Syria.” We found interviewees through personal connections and knowledge of the area, as well as through Google searches of relevant NGOs and Facebook, the most commonly used social media platform in Syria.

In total, we interviewed 15 people for the 10 cases, all of whom requested anonymity in the reports for their own safety from being prosecuted or targeted. The interviews provided valuable primary source information for the case studies. Additionally, we gathered information from a range of media sources, including local media outlets in Arabic and English, Syrian government-controlled media such as the Syrian Arab News Agency (SANA), and opposition media reports online, such as Syria TV, radio, and TV programs.

One of the biggest challenges we faced was finding unbiased information in a country where various groups and governments controlled their own news media channels. To ensure the final report was as neutral and unbiased as possible, we employed a rigorous methodology that involved cross-checking every fact. We compared different reports from various political orientations and affiliations, identifying the most trustworthy sources. Additionally, using reports in English from international humanitarian organizations such as the United Nations and its branches, including UNDP, UNICEF, OCHA, and FAO, helped verify information.

Social media platforms, such as Facebook, Twitter, and YouTube, were helpful in localizing environmental justice movements. Despite government censorship of Facebook in Syria, we identified some online campaigns related to environmental justice movements, such as organizing street protests or meetings with authorities. We also identified groups dedicated to biodiversity conservation by raising awareness among people about different animal and plant species.

In addition to social media, we relied on local and international academic research papers to support our case studies. This allowed us to contextualize our findings within an established academic framework, ensuring the credibility of our research and the accuracy of our conclusions. By utilizing a multidisciplinary approach that drew on a range of data sources and methodologies, we aimed to produce a robust and reliable report.

4. CASE STUDIES

In this report, the case studies were systematically classified according to the ten categories specified in the Environmental Justice Atlas (EJAtlas). These categories cover a broad spectrum of concerns, such as water management conflicts, biodiversity conservation conflicts, waste management conflicts, biomass and land conflicts, fossil fuels and climate justice/energy, industrial and utility conflicts, among others. This classification approach was adopted to enhance the analysis of environmental justice challenges globally and specifically in Syria in this report. By employing this framework, a more comprehensive understanding of the complexities and nuances surrounding environmental justice issues was achieved, enabling deeper insights and informed decision-making.

4.1. WATER AS A WEAPON OF WAR. WATER MANAGEMENT AND THE SYRIAN ARMED CONFLICT:

4.1.1. BARADA RIVER POLLUTION PROBLEM IN DAMASCUS, EXACERBATED BY THE SYRIAN WAR.

a. The Barada river:

The Barada River is a vital resource for the city of Damascus, providing drinking water for a large population and irrigating a significant area of agricultural land in Al-Ghouta. In addition to its practical uses, the river also creates an oasis in the dry region surrounding Damascus, offering recreational and tourist attractions for the people of Damascus and the surrounding areas. Overall, the river plays a crucial role in the social, economic, and environmental well-being of the region.[5,6]

The pollution of the Barada River has been a longstanding issue that has only got worse over time. The main sources of pollution in the Barada River are untreated sewage, industrial waste, water mismanagement, agricultural runoff, and waste from tourist establishments such as restaurants and cafés. The city of Damascus and its surroundings generate a large volume of sewage that its outdated treatment facilities cannot adequately process. As a result, raw sewage is often released into the river, contaminating the water with harmful bacteria and other pollutants. Industrial waste is another major contributor to the pollution of the Barada River, with many factories in the region discharging their waste directly into the water, adding chemicals and toxins. Agricultural run-off, resulting from the use of pesticides and fertilizers on the region's farms, is also a source of pollution.[5,6]

b. Syrian armed conflict and river pollution:

During the Syrian conflict, the Barada River was used as a weapon of war by both the government and opposition groups. In 2017, the battle of Wadi Barada took place between the two sides, with the government accusing the opposition of dumping large quantities of diesel into the source of the city's water supply, leading to the shutdown of the water supply to Damascus. The opposition, on the other hand, claimed that they cut the water supply as a pressure tactic to prevent the government from overrunning the area. The conflict has also led to a high number of internally displaced

people (IDPs) in Damascus, with more than 600,000 IDPs, or 33% of the city's population (the population of Damascus is estimated to be 1,828,845 in 2021, OCHA 2022). This increase in population has put extra pressure on the water supply and resulted in an increase in domestic water discharge into the river.[7,8,9]

Studies have found high levels of chromium in the sediments and soil adjacent to the Barada River, as well as high levels of copper and nickel from electroplating industries and titanium from polishing and tanning industries waste in the industrial areas near the river. A study in 2002 revealed that the river's BOD (biochemical oxygen demand) levels were above standards downstream of the river, likely due to the contamination with domestic water waste from the city being dumped into the river.[10,11]

The water pumping station located in Ain al-Fijeh, on the outskirts of Damascus, suffered damage during the battle in the Wadi Barada area after government forces recaptured the area from the opposition in January. Source: The New Humanitarian.

c. Activism and Advocacy for the Protection of the Barada River in Damascus:

In Damascus, people have been protesting against the pollution of the Barada River through various means, such as social media campaigns, letter writing and petitioning the government, conducting research and data collection, and partnering with environmental organizations to raise awareness and advocate for change.[12,13]

4.1.2. THE ALLOUK WATER STATION SHUT DOWN IN AL-HASAKAH.

a. Al-Khabour river and the Turkish invasion:

The Al-Khabour River originates and flows through southeastern Turkey to northeastern Syria, with a total length of 388 kilometres, of which 308 kilometres are in Syria. It is the largest of the three tributaries that join the Euphrates River. In 2019, Turkey launched a military invasion of northeast Syria known as “Operation Spring Peace”. This invasion displaced more than 200,000 people and the Syrian non-state military serving as Turkey’s ground force has been accused of committing war crimes.[14,15,16,17]

Turkey has reduced the amount of water from the Euphrates River that flows into Syrian territory to a quarter. If Turkey continues to violate the 1987 agreement by limiting the water flow (Syria and Turkey entered into a bilateral agreement in 1987, in which Turkey promised to provide a minimum of 500 cubic meters per second of water to Syria), cities such as Aleppo, Raqqa, DeirEzzor, and Al-Bukamal may face a humanitarian catastrophe. The current water flow is reportedly only 200 cubic meters per second, far below the agreed-upon amount.[18,19]

b. Disrupted and Displaced: The Impact of the Allouk Water Station Shutdown on Northeast Syria

The Allouk water station on Al-Khabour river, as described by the UN as ‘’the primary source of clean drinking water for 460,000 people’’, has been repeatedly disrupted since November 2019. As of 23 June 2019, the station has stopped functioning due to maintenance and repair access limitations and a lack of electricity, resulting in a severe water shortage across Al-Hasakeh governorate. And it was also shut down by Turkish strikes in October 2019. The disruption has affected up to 1 million people, including many displaced families in camps and informal settlements who are particularly vulnerable. Turkey is accused of acting as an occupying power in parts of northeast Syria and using the closure of the Allouk water station as a negotiating tactic to leverage negotiations over electricity provision in exchange for Allouk water with the Kurdish-led autonomous administration.[20,21,22]

c. Water Shortages and Disease Outbreaks

The shutdown of the Allouk water station in Syria has resulted in a water shortage, increasing the risk of COVID-19 and the spread of other water-borne diseases. The drought has led to an increase in cases of Leishmaniasis, and a cholera outbreak was declared in September 2022, posing a serious threat to the Syrian people and the Middle East region. Access to clean water is crucial for basic hygiene and sanitation, and Human Rights Watch has urged Turkey to stop contributing to the worsening water crisis in Syria.[23,24]

d. Water Shortages and Agriculture loss

Local farmers in the Al-Khabour valley are reporting that Turkish projects are causing loss of agriculture and livestock due to low water levels in the river. This has led to contaminated water that is unsuitable for animals to drink and the inability to irrigate crops, resulting in a once-cultivated area now becoming barren. The fishing industry has also been affected, causing a decline in livelihoods. The director of water resources warns of an imminent disaster, estimating that at least three million people are at risk of food insecurity due to interrupted irrigation. The water shortage is also affecting the availability of drinking water in the region.[25,26,27,28]

e. Syrian Citizens and Organizations Speak Out Against Turkey's Control of Water

In Syria's Al-Hasakah, a protest was organized by the General Activities Committee of the Educational Complex to denounce Turkey's cut-off of water supply from the Allouk Water Station. The local community and civil society groups in Al-Hasakah and Kobani joined the opposition. Multiple organizations and international entities have called for intervention and compliance with water-sharing rules. The United Nations has emphasized the need to restore water flow and protect civilians while delivering humanitarian aid.[29,30,31]

The main water pipe of the Allouk water station was damaged due to the bombardment with artillery by Turkey and its allies. Source: Syrians for Truth and Justice.

4.2. WASTE MANAGEMENT AND SYRIAN ARMED CONFLICT:

4.2.1. THE WADI AL-HUDDA LANDFILL: A BATTLE FOR ENVIRONMENTAL JUSTICE IN TARTOUS.

The Wadi Al-Hudda solid waste treatment plant was established in 2004 and is located near the Tartous governorate. It covers an area of approximately 10 hectares and processes municipal solid waste from the Tartous governorate.

The plant was designed to handle approximately 400–450tons of waste per day, which was the estimated amount of waste generated by the Tartous governorate. However, after the conflict in Syria was erupted and the influx of displaced people to Tartous governorate in addition to the increase of Tartous inhabitants (According to the UNHCR, the Tartous governorate in Syria received an estimated 180,735 displaced people by 2021, which represents approximately 19.47% of the total population of the governorate. This percentage is based on the estimated population of the Tartous governorate, which was 929,366 inhabitants, as reported by UNOCHA in March 2021), the amount of waste increased to 800 tons per day; and the plant became unable to effectively treat and manage all the waste in the governorate.

Residents of the surrounding villages have been experiencing significant impacts from the pollution caused by the Wadi Al-Hudda landfill. For example, many people from Al-Zarkat village have complained that their wells are polluted, with over 100 wells being affected. There are concerns that the drinking water in the area could become entirely polluted.

There have been reports of people becoming poisoned after consuming water from wells in the region. The citizens of Al-Zarkat are now forced to buy bottled water at a cost of 2,000 Syrian pounds per bottle (Al-Zarkat average salary in Syria was 100,000 Syrian pounds per month in 2022), and more than 15,000 people are affected by the pollution. In addition to the water quality issues, the landfill has caused other problems for the community, including an increase in mosquitoes and the spread of rubbish along the Safita-Tartous road.

There are questions about why the issue of the Wadi Al-Hudda landfill is not being taken more seriously by the competent authorities, and why it has not been addressed by members of the People's Assembly. The landfill is seen as a significant danger to the community, and residents are concerned about the negative impact it is having on their health and well-being.

According to a study conducted in 2013, there is significant bacterial contamination in the well water within the Wadi Al-Hudda area, as indicated by high levels of BOD (biochemical oxygen demand) and COD (chemical oxygen demand). This contamination is believed to be caused by the filtration of waste and asphalt aggregate in the landfill.

According to Syrian standard specifications, the ground and surface water at the site is polluted and unfit for drinking. The use of contaminated well water has resulted in the occurrence of disease cases, including acute intestinal diarrhoea and infections of the digestive system. A questionnaire found that 40% of respondents reported being exposed to diseases due to landfilling or the use of groundwater wells, and most of them stopped using this water for drinking and only used it to irrigate agricultural crops. The results also showed that 65% of the population in the area are farmers who have lived there for over 50 years, with 20% relying on technical drilling for their water needs.

The residents of the villages near a rubbish landfill began an online campaign called **"The Cancerous Wadi Al-Hudda landfill, together we can close it"** to advocate for the closure of the landfill. They created a Facebook page with about 3,000 followers to raise awareness about the issue and encourage people to act. They also held events such as public meetings to bring attention to the issue. Through their efforts, they were able to mobilize a large group of supporters who are trying to persuade local authorities to close the landfill and implement alternative waste management practices.

On August 15, 2021, the people organized a street protest and blocked the road to the landfill to prevent trash trucks from accessing it. They were protesting the continued operation of the Wadi Al-Hudda landfill, which they consider the largest environmental disaster on the Syrian coast. The landfill has reached its maximum capacity since 2017, and was supposed to stop receiving waste, but rubbish from the Tartous governorate continues to be transported to it daily, causing harm to the people with no foreseeable solution until this day.

See sources. [32-39]

People protesting the ongoing operation of Wadi Al-Hudda by blocking the road to the landfill to prevent trash trucks from accessing it. Source: Facebook

4.2.2. AL-BASSA LANDFILL: CLOSED AFTER CONTAMINATION HAD SPREAD TO THE LAND, WATER, AND AIR

Al-Bassa landfill in Latakia was opened at the beginning of the 1970s. It was under the supervision of the Latakia city council, and it was supposed to be closed by 2009.[40]

By 2011, the landfill capacity had reached its maximum, and despite that, it was still receiving about 800 to 1000 tons of rubbish per day from the countryside and the city of Latakia, the rubbish was dumped without being covered in soil or processed, which converted the site into mountains of piled garbage (the amount of uncovered waste was 1 million tons in 2019).40 The amount of rubbish dumped in the landfill has increased during the ongoing war in Syria, as the population of Latakia has grown due to the influx of refugees from other parts of the country.[41]

Studies have been conducted to examine the impact of the Al-Bassa landfill on water quality. One such study found that the water in nearby rivers and wells exceeded permissible limits for drinking water and contained higher levels of Biological Oxygen Demand (BOD5), indicating contamination. Another study discovered that the groundwater surrounding the landfill contained high levels of nitrate and phosphate, likely due to solid waste pollution. Additionally, the soil in the landfill area is contaminated with nickel, lead, and cadmium beyond normal limits. These findings suggest that the landfill poses a risk to human health and the environment and recommend its removal.[42]

The burning of the piles of trash that rose and expanded in the Al-Bassa landfill has been a source of concern for the people of Latakia and its surroundings. The trash also became a hotspot for insects, particularly mosquitoes, rodents, and stray dogs. Many scavengers combed the site hunting for plastic or glass to sell and make a living, while also opening and spreading the waste.[40,43]

People protested in different ways in a response to the lack of treatment and the authorities' failure to take drastic measures, including cutting roads to the landfill, filing complaints to the authorities, speaking on TV, newspapers, and radio, and using social media platforms such as Facebook, YouTube, and others.[44]

The mayor of Al-Bassa village said in 2018 to 'Ninar FM' (a local radio station): ***"The situation is bad; there are rubbish piles and mountains everywhere, and smoke is spreading everywhere too. The landfill is located on one of the most beautiful beaches in the Mediterranean, which could have been a national treasure before the landfill was built."***

"For almost six years, the government has promised to relocate the landfill. Every time we ask, they say they will relocate it within the next six months. The dump has harmed our farmers and agricultural lands, and our groundwater has been poisoned."

''A huge portion of our citrus-planted lands was damaged, and the cost of pesticides on our seasonal crops exceeds the total amount of money we earn from producing them."

''The effects are not limited to our agriculture, people are also suffering from the effects, we had some cases of leishmania." [45]

The landfill has also had an impact on people's livelihoods, particularly farmers, who have expressed concerns about the contamination of soil and water, both of which are essential for agriculture: ***"The vegetables that we produce are not completely safe, we sell them for lower prices."*** [45]

A local doctor in Al-Bassa village, Tamin keddah, said: ***"It is unhealthy for the locals to have this landfill in this region. Smoke from burning rubbish causes lung cancer and respiratory conditions like asthma. The area is abundant with mosquitoes that are transmitting diseases, and the landfill also attracts stray dogs and rodents."*** [45]

The Syrian Arab News Agency (SANA), announced on the 27th of January 2022 the landfill of Al-Bassa was closed after establishing a new one in Qasieh in Al-Haffa region in Latakia.[46]

It also emphasized that the new landfill's operation closes the file of environmental pollution caused by the Al-Bassa landfill, which has been a source of concern for the people of Latakia and the government in recent years due to the end of its design life and the incineration of waste and smokes resulting from it.[46]

The burning mountains of garbage in al Bassa landfill. Source: Almashhad online

4.3. INDUSTRIAL AND UTILITIES CONFLICTS AND THE SYRIAN ARMED CONFLICT

4.3.1. CEMENT FACTORY POLLUTION IN TARTOUS: "ECONOMIC BLOCKADE AND LIMITED RESOURCES OBSTACLES TO UPGRADING FACTORY EQUIPMENT AND REDUCING POLLUTION"

The Tartous cement factory is one of the largest state-owned cement factories in Syria. It is located in the governorate of Tartous and about 1.5 kilometres away from the Mediterranean Sea. The area of the factory is surrounded by agricultural lands that are mainly cultivated with olive trees and greenhouses.[47]

For decades, Tartous residents and people who live nearby the factory have been concerned about the pollution coming from the city's cement industry. The daily exposure to cement manufacturing dust threatens people's lives and livelihoods, as it can travel over 10 kilometres before precipitating on land and sea.[47]

According to the United States Environmental Protection Agency (EPA), cement factories are major contributors to the emission of sulphur dioxide, nitrogen oxide and carbon monoxide, which can harm children and individuals suffering from lung conditions such as asthma. Prolonged exposure to these substances can harm lung tissue while reducing oxygen flow to the body's organs and tissues and impacting the cardiovascular and nervous systems.[55]

In the area of the factory, the average dust particle concentrations range from 115 to 486 μg/m3, surpassing the 150 μg/m3 WHO acceptable limits. According to statistics from the National Environmental Action Plan (NEAP 2003), the air around the factory and its surroundings contains TSP, PM10, and PM3 concentrations that were above international and Syrian standards (Syrian Ambient Air Quality Standards, 2004).

Research conducted by the Ministry of Health in 2005, found that the towns and villages near the Tartous cement factory had higher incidences of bronchitis and respiratory illnesses than similarly situated clean areas.[47]

Many residents of the villages surrounding the plant stressed that the amount of falling dust is unbearable, and some of them said that if the situation continues as it is they will have no choice but to leave their homes for a more suitable living area. They also pointed out that the demand for a solution rose in 2016 but was never answered.[48]

People protested on local and social media and expressed their concerns about their health and their children's, blaming the factory for the diseases spreading in the areas surrounding the factory where several cancer cases and respiratory diseases have been reported.[49]

According to the Ministry of Justice, dozens of lawsuits are filed every year against the factory by people who own neighbouring properties to compensate for the damage caused by the dust emitted by the factory's kilns.50 In the most affected village by the cement dust, Husayn Al-Baher, the head of the agricultural association and a local agriculture engineer of the village complained to the local media saying: **"The damages are real and serious, and the compensation paid by the factory is insufficient, with a large percentage going to attorneys"**. "Tartous cement factory pays are far less than the actual harm to our properties and agricultural revenue". " We cannot breathe, we cannot sit outside" "Our food, clothes, and land are contaminated with the dust that is coming from the factory."

Several studies confirmed the farmers' complaints about the factory's impact on agricultural yield. The dust emission from the factory reduces the growth and production of olive trees in the surrounding areas, as caused by a decrease in chlorophyll content in the leaves of olive trees, as well as a reduction in tree branch length and weight. The calcium content in the dust is high, and when combined with air humidity, it creates a coat on the tree leaves, affecting tree growth in the factory's surrounding areas.[51,52]

The factory does not only have an impact on people's health, livelihood, and agriculture, but it has also reduced the value of their properties. As with any property for sale, the square meter is valued at less than half of its true value because it is next to the factory.[53] The company's general manager, Hilal Omran, who took over in mid -May 2020, confirmed that ***the technical situation is bad, and that work is being done by its cadres to improve it as much as possible, indicating that the company is serious about improving the performance of the company. He also stressed that the current filters used to cut down on pollution are old. The supply and installation of new cloth filters to end pollution are linked to the economic feasibility, as well as the wear and aging of equipment, and the difficulty of obtaining replacement parts of foreign origin (mechanical, electrical, and electronic equipment) due to the country's economic blockade due to the ongoing war.***[54]

The people of the affected areas demanded to relocate the factory and use its location for residential and tourist installations. They stressed that the location of the factory has a lot of tourist potential, and the building of this factory was hampering it. [49] Despite all the complaints to the authorities, some people from Husayn Al-Baher village said that they have been promised a solution to this situation for 3 decades while the authorities promised to install smoke filters, but it was never implemented. [49]

The Tartous cement factory. Source: Snacksyrian

4.3.2. RUSSIAN SUPERSONIC JETS NOISE POLLUTION

Residents of the town of Hmeimim in Syria have reported that the residential buildings in the town are experiencing cracks on their walls and rooftops that are getting wider every day. This has caused most of the town's population to flee to areas far from the airport. According to Al-Quds Al-Arabi report in 2015, a civil engineer whom they interviewed stated that if Russian warplanes continue to operate in this manner, it will have "disastrous" effects on the nearby town and people. The engineer explained that the planes take off near the town at low altitudes, creating a loud noise, a white cloud, and a pressure of air particles that can disturb the foundations of buildings and increase the load pressure on them, leading to the appearance of cracks that can reduce the lifespan of the buildings and potentially cause them to collapse. A real estate owner in the town also confirmed that the price of buildings has fallen by a quarter and that the town's urban movement has come to a complete halt due to the displacement of more than half of its population, estimated at 15,000 people.[56,57]

Additionally, the rental of residential homes has stopped, and the town is described as "falling apart." The Russian military planes at the Al-Hmeimim Airport, located between Jableh and Latakia on the Syrian coast, have caused problems for residents living in nearby villages, with some describing the situation as "catastrophic." Children in the area have reportedly been terrified by the loud noises made by the planes, some people also reported the loss of their sense of hearing. There have been instances of missiles falling from the planes, though fortunately without causing any human casualties. Some residents have had to leave their homes due to the danger and have not received any compensation for damages.[56,57]

The response from the community has been limited to a few complaints, but there is no visible evidence that the issue has been brought to the attention of the authorities. The people who have been affected by the presence of the base have either chosen to leave the area or have had to tolerate the situation until now. It is not clear what the specific issues or challenges are that the community has faced due to the presence of the base, but it is mentioned that the noise and vibrations from the planes taking off and landing have caused damage to buildings and disrupted the lives of the residents. Some people have also expressed concern about the safety risks associated with the base, including the potential for accidents or the possibility of missiles falling from the planes. Despite these challenges, it appears that the community has not taken collective action to address their grievances or seek compensation for the damages they have suffered.[56,57]

4.4. FOSSIL FUEL AND CLIMATE CONFLICTS

4.4.1. THE BANIYAS OIL SPILL: CRACK AND WEAR OF THE OIL TANK

The thermal power plant in Baniyas is one of the five power stations in charge of supplying the country with electricity, it is situated in the city of Baniyas in northwest Syria and provides around 20% of the country's electrical needs. [58]

On August 23, 2021, a massive oil leak from the Baniyas´s thermal power plant released 15,900 tons of TTP oil into the Syrian eastern shore of the Mediterranean.[59] According to the Syrian Arab

News Agency SANA [60] the leak was caused by cracks and wear in an oil tank at Baniyas' thermal power plant, resulting in fuel seeping into the sea about 20 kilometres north of the refinery in Baniyas[60], the inadequate maintenance of the thermal power plant's infrastructure may have been triggered by the economic crisis stemming from the ongoing armed conflict, which consequently led to the oil spill. This means that the financial strain brought about by the conflict may have prevented the proper upkeep of the plant, resulting in its malfunction and subsequent spillage of oil.

The environmental department of the Syrian government announced that they immediately informed all concerned departments about the leak that reached the coastal town of Jableh and the municipality of the coastal province of Latakia. Additionally, they reported that efforts will be made to clean the rocky regions along the coast.[60]

Dawoud Darwish, head of the Tartous Union's Electricity Workers Syndicate, claimed on the 24th of August that the fuel leak had been contained. He also stated that some fuel from one of the thermal station's fuel tanks flowed into the sea due to "wear and tear," and that the tank contained 15,000 tons of fuel.59,60 Darwish's statement was followed by another statement on 30th of august by Ghassan El-Zamel the Syrian minister of electricity said to al Watan newspaper that:

"What happened cannot be described as pollution, but the incident was noticeably hyped through social media, the fuel that reached the sea does not exceed 4,000 tons".[62]

The fisherfolks refuted all the claims, saying that they had to move their fishing locations to escape the oil slicks.[63]

Despite efforts by the government to minimize the disaster, satellite images revealed that a strong oil stream extended northwest from Baniyas to Cyprus and Turkey.[64]

Dr. Samer Ghadeer, the dean of the higher institute for marine research, confirmed to the local newspaper (Al-Watan) that the oil spill in Baniyas caused the deaths of a sea turtle, fish, and several water crabs in addition to other marine life, according to a primary investigation on the oil spill.[65]

The oil spill also had a direct impact on local fisherfolks and their livelihood, who reported that fish sales in Tartous declined by 60% after the spill, in addition to a significant drop in fish prices. [66,67]

Khalid, a local fisherman said: ***"Since the first hours of the leak, the Syrian authorities have downplayed its seriousness through a counter-propaganda campaign stating that the matter is simple, at a time when people were seeing dark oil spots dyeing the seawater black. The only thing left for us is the sea and they are destroying it! Everyone says we are used to it, but the problem is that the traces of oil that reached the sea will remain for years, and even our children will suffer from this pollution."*** [67]

Decontamination operations extend to the shores of Jableh. Photo credit: SANA.

4.5. BIODIVERSITY CONSERVATION UNDER THE SYRIAN ARMED CONFLICT

4.5.1. RARE FALCONS ILLEGAL HUNTING AND TRADE IN EASTERN SYRIA

Falconry is a traditional practice in Syria that has a long history in the Levant. Despite being regulated by the General Authority for Wildlife (GAW) and the Treaty on International Trade in Endangered Species of Wild Fauna and Flora (CITES), there is a significant illegal trade in falcons in the country. This illegal trade poses a serious threat to the survival of falcons, particularly the critically endangered Saker falcon, whose population is declining due to offtake for falconry, habitat loss, and illegal trade. Resident bird groups, such as the Wakri and Barbary falcons, are also experiencing declining numbers.

In recent years, falconry in Syria has become more popular and lucrative, especially since the onset of the war. The demand for falcons has led to an increase in the number of falconers, but the lack of law enforcement and low penalties for hunters have contributed to the illegal trade in falcons. Poaching is facilitated by smuggling networks between Syria and Lebanon, and economic pressures of war, such as unemployment and poverty, provide incentives for poachers to engage in falcon hunting.

The illegal traffic in falcons has become a booming business, facilitated by the rise of social media pages dedicated to the hunting and sale of these birds. These pages function as a marketplace and a simple way for buyers and sellers to interact and are driven by demand from wealthy Arab Gulf individuals.

Traditional hunters have expressed concerns about what they call hunting intruders, stating that ***“The new emerging wave of hunters lacks the ethics of this old tradition and has no respect***

for hunting rules." The hunting law in Syria is outdated, with the current legislation dating back to 1970, and fines for breaching the law are relatively low and do not reflect the current financial and conservation status of the country.

See sources.[68 - 82]

A falconer presenting his valued hunting capture. Source: Facebook

4.5.2. THE MASS KILLING OF THE RARE AND THREATENED SAND GAZELLE BY ARMED GROUPS IN AS-SUWAYDA

The Arabian sand gazelle, *Gazella subgutturosa spp. marica,* is classified as Vulnerable on the IUCN's red list. In 1996, the Syrian government reintroduced 30 gazelles from the captive population to At Talila Reserve. The gazelle population was observed to be recovering from 2013 to 2017 when the areas were inaccessible due to the Syrian war. After 2017, illegal gazelle hunting resumed and intensified, mainly carried out by powerful individuals with access to protected areas. Hunters target the whole gazelle population, including young calves and regardless of reproductive seasons. The hunted gazelles are either consumed, captured alive and sold, or mounted. The total number of killed gazelles is unknown but is believed to be higher than 75 individuals. Local people and wildlife activists condemn the mass killing of gazelles and are calling for authorities to intervene to stop the massacre that could result in eradicating the whole population of gazelles from the area. Despite a recent hunting regulation that prohibits all types of wildlife hunting in Syria, illegal gazelle hunting continues.[83, 84, 85, 86]

A gazelle hunter in As-Suwayda desert. Source: Raseef22.

4.5.3. THE DEFORESTATION OF MAYDANKI LAKE FOREST IN AFRIN (SYRIA) BY ARMED FACTIONS

In 2018, the Turkish-supported Syrian National Army took control of Afrin and its surroundings in Northern Syria. On August 31, 2022, a large-scale deforestation took place in the protected natural area around Maydanki Lake, which was once a popular recreational spot for locals. It is claimed that roughly 70% of the Maydanki forest was cleared, and trees on the island in the lake and on the mountain were burned. Local inhabitants and activists blamed the Syrian opposition factions backed by Turkey for the deforestation, allegedly carried out by the "Sultan Murad Division," with the purpose of selling the trees to firewood dealers for the winter. This incident has reactivated anger among the local community and activists in Afrin, and they called for accountability for those responsible for deforestation, laws to protect the environment and afforestation campaigns throughout Northern Syria. The destruction of protected areas like Maydanki Lake highlights the devastating impact of the ongoing conflict and military operations on the environment and local communities in Syria.[87, 88, 89, 90]

Maydanki lake forest before (upper part) and after (lower part) the deforestation. Source: Syria Direct

5. SOCIOPOLITICAL EFFECTS OF ENVIRONMENTAL INJUSTICE IN SYRIA

The **sociopolitical implications of environmental injustice in Syria from a humanitarian perspective** has created a complex web of **socio-political consequences** that exacerbate the **suffering of the population.** Here are some key implications:

Displacement and Migration As people are forced to leave their homes due to environmental hardships, they become internally displaced or seek refuge in neighbouring countries. This influx of displaced populations puts an additional burden on already overwhelmed humanitarian resources, leading to social and political tensions in host communities.

Conflict and Instability: “Climate change induced environmental injustices between 2006 -2010 intensified already existing grievances of the Syrian rural population and had played a role in triggering the Syrian crisis, which has had devastating outcomes for the whole region until today.

Access to Resources: Environmental injustices disproportionately affect marginalized communities, like IDPs and especially camps’ residents. Limited access to clean water, food, and adequate sanitation facilities further undermines their well-being and creates social inequalities and humanitarian needs, potentially leading to other implications, and negative coping mechanisms.

Health Impacts: Environmental injustices have severe health implications for the population. The health challenge discussed in this report stresses out the already fragile healthcare system and impedes the overall wellbeing of the traumatized population, whose mental health is not discussed enough whatsoever.

Loss of Social Cohesion: Environmental injustice erodes social cohesion and trust within communities. As resources become scarce and competition for basic necessities intensifies, societal divisions may deepen, leading to conflicts over access to vital resources. This breakdown of social cohesion holds back efforts to rebuild communities, fosters a sense of injustice, and creates fertile ground for further instability and humanitarian crises.

International Relations and Regional Dynamics: The sociopolitical effects of environmental injustice in Syria have broader implications for regional dynamics and international relations. The influx of refugees outside Syria put pressure on the international community to provide humanitarian aid, leading to debates over responsibility and burden-sharing.

Addressing the sociopolitical effects of environmental injustice in Syria requires a comprehensive and integrated approach that combines humanitarian assistance, environmental conservation, conflict resolution, and inclusive governance. Efforts should aim to ensure equitable access to resources, promote sustainable development, strengthen institutions, and foster social cohesion to mitigate the adverse impacts and promote a more resilient and just society.

6. CONCLUSIONS AND RECOMMENDATIONS

The Syrian conflict has led to the destruction of the natural environment and wildlife, with illegal hunting and deforestation continuing to occur at an alarming rate. The water crisis caused by the conflict has led to contamination and misuse of water resources, resulting in devastating consequences for the population. Waste management in the country has also been affected, with landfills reaching their maximum capacity and causing environmental pollution and health problems for local communities. The pollution caused by the Tartous cement factory and Russian supersonic jets in Hmeimim has also had detrimental effects on the health and livelihoods of residents in surrounding areas. The Baniyas oil spill is another environmental disaster that has had a significant impact on the marine ecosystem and local residents.

Recommendations:

1. The international community should support Syrian citizens and organizations in advocating for the protection of natural resources and holding all parties accountable for their actions that harm the environment.
2. Strengthen law enforcement and penalties for illegal hunting and deforestation: The Syrian government should revise and update the current laws regulating wildlife hunting and deforestation to reflect the current conservation status of the country's flora and fauna. The penalties for violating these laws should be increased, and law enforcement should be improved to ensure that they are enforced.
3. Raise awareness about conservation: Education and awareness-raising campaigns should be implemented to help the local population understand the importance of preserving their natural environment and the rare and endangered species that inhabit it. This could include the promotion of ecotourism and the involvement of local communities in conservation efforts.
4. The Turkish government should respect the 1987 agreement with Syria and ensure the minimum amount of water flow to Syrian territory.
5. The Syrian government should prioritize the protection of water resources and address the issue of domestic water waste management to prevent further pollution of the Barada River.
6. Humanitarian organizations should increase their efforts to provide clean water to those affected by the water crisis, including IDPs and vulnerable populations in camps and informal settlements.
7. Research and data collection should be conducted to further understand the impact of the water crisis and inform policy decisions on water management in Syria.
8. It is recommended that the Syrian government takes action to develop and implement alternative waste management practices, such as waste reduction, recycling, and composting. This can help to reduce the amount of waste going to landfills and improve the health and

well-being of local communities. The government should also invest in infrastructure and technology to support these practices.

9. It is recommended that the government involves local communities in waste management planning and decision-making. This can help to build trust and cooperation between the government and local communities and ensure that waste management practices are tailored to the specific needs and concerns of the communities affected by them.

10. It is essential that the international community supports efforts to improve waste management in Syria, including providing financial and technical assistance to support the development and implementation of alternative waste management practices. This can help to address the environmental and health impacts of the conflict and contribute to the long-term sustainable development of the country.

11. The Tartous cement factory needs to upgrade its equipment, including installing new filters to reduce pollution emissions.

12. The Syrian government needs to support the factory in obtaining replacement parts and resources to upgrade the equipment and reduce pollution emissions.

13. The factory needs to consider relocating to an area far from residential areas and agricultural lands.

14. The Russian government needs to consider the effects of their military operations on nearby towns and take necessary measures to reduce noise pollution and prevent damage to buildings and infrastructure.

15. The residents of Hmeimim need to be compensated for any damage caused by the Russian military operations.

16. The Syrian government needs to establish stricter regulations to control pollution emissions from factories and prevent further harm to the environment and public health.

17. Improving the maintenance and safety standards of power plants, as well as implementing effective emergency response plans to quickly contain and mitigate the effects of spills. Additionally, there should be increased efforts to minimize the environmental impact of armed conflicts, including providing adequate resources for environmental protection and restoration efforts in conflict zones.

18. It is also essential to support affected communities and provide them with the necessary resources and support to recover from the economic and environmental damage caused by the oil spill. Finally, it is crucial to raise awareness and advocate for sustainable energy alternatives that can reduce dependence on fossil fuels and promote a more environmentally friendly and sustainable future.

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