War and the Environment: Lessons From Palestine, Congo, and Sudan

Hello, everyone. Welcome back to the Speak Environment podcast. I'm your host, Cierra Dawson. Welcome to 2024. I haven't spoken to you all since around this time last year. You know, people like to say that time flies when you're having fun, and I do think that that's true. But I also think that time especially seems to fly when you're experiencing a perpetual existential crisis in the background of your daily life.

Okay, okay—that was kind of heavy.

And unfortunately—or fortunately, [depending on] the way that you think about it—it matches the mood of today's episode. Because today's episode is about war and its impact on the environment. As you may or may not have known, 2023 brought about the beginning of some horrific wars and humanitarian crises around the Middle east and Africa. Specifically, the world's attention has been captured by one gruesome conflict in particular, and that is Israel's war—or more aptly titled, ***genocide***—on the people of the Gaza strip.

Now, I want to drop the act right here, right now, and just be upfront with you as a person. This episode is not objective, as we so badly want science and science communication to be. To be clear, there is absolutely a time and a place for objectivity in science, without a doubt. But just to be frank, this episode is not that time or place. This episode is opinionated. It stands against genocide and land dispossession and Western imperialism, which are all things that we're going to be discussing. To be honest, it will be hard to listen to at certain points. And I know even me saying that is probably hard to hear. You know, we as people are trained to cling to comfort and safety in the name of self-preservation. And so for me to preface a podcast episode with such a heavy warning, it may make you want to just instantly turn it off. But there is this saying that “growth happens outside of your comfort zone,” that has fueled me to create this episode for you today. And I invite you, listener, to stay with me for a while and listen, even if it is uncomfortable at certain times. If you're up for that, then let's proceed.

Now, like I said, today's episode is about war, but specifically, the purpose of this episode is to explore the intersection of armed conflict, genocide, and its impact on the natural environment. To do this, I want to explore three current conflicts that are happening right now as we speak in Palestine, Israel, the Democratic Republic of the Congo, and Sudan. In

each place, I'm going to introduce you to the geographic location, give you some just context—some neighboring countries. We're going to talk about the climate and biodiversity, what you would find there, the conflicts that are happening, and how they are impacting the environment in each place. One last disclaimer before we begin. This episode intentionally focuses on the environmental impacts of these conflicts because of the nature of this podcast. It's an environmental podcast. However, this is by no means meant to exclude or minimize the human element. To be very clear, tens of thousands of innocent people have lost their lives to what I am going to share with you all today. I will touch on the impacts to humans as I introduce each country but understand that this episode is **not** a comprehensive deep dive into the history of these locations, nor will it thoroughly illustrate the root causes of each of the conflicts. I have assembled a plethora of links to further coverage and resources I use for today's episode that you can explore afterwards in the show notes.

Alright. And with all of that, let's begin.

Part 1: Israel-Palestine War

We're going to begin our journey in Historic Palestine, which today is mostly occupied by Israel. Historic Palestine is located on the southwest tip of the Asian continent in the eastern basin of the Mediterranean Sea. Its climate is laterally divided between hot summer Mediterranean climate in the north and hot desert climate in the south. Ecologically, Historic Palestine covers a vast range of ecosystems, from the humid Mediterranean coast to the arid desert, in total covering five eco zones with many diverse habitats. According to the Palestine Institute for Biodiversity and Sustainability, “Historic Palestine is located between three continents in the western part of the Fertile Crescent where humans first developed agriculture. The unique geography and geology gave Palestine more biological diversity than some countries 10 times its size.” Over 130 mammal species have been recorded in Palestine, along with around 500 million birds annually. It's also very rich in flora, has over 3,000 floral species documented. The West bank alone has over 1,600 floral species documented. Out of all these species, roughly 7% are endemic to the country, meaning that they can be found nowhere else in this world.

Despite the arid climate, Palestine is a hub for agriculture. According to Al Shabaka, an independent transnational think tank, Palestine has staples such as olives, Zatar, figs and date palms that are deeply rooted in the culture and history of the land. They provide nourishment

during difficult times, require little in terms of water and maintenance, and are well adapted to the climate. So overall, historic Palestine is a beautiful place. But unfortunately, it has a very dark history. Because now, I want to introduce you to the current conflict that is happening there, better known as Israel's genocide against Palestinians in the Gaza Strip. If you were to pause here and search for Palestine on Google Maps it will zoom in on a very small enclave off the coast of the Mediterranean Sea called Gaza. Aside from the West Bank, the Gaza Strip is the only other remaining area occupied by Palestinians from the greater historic Palestine territory. It is a tiny literal strip of land that measures only 25 miles long, and at its widest, only 7.5 miles [in width].

The conflict in Palestine is being described as the first genocide in history that is being livestreamed by its victims and consumed in real time by the watching world. If you also googled the question “what is happening in Gaza?” A lot of the results will point to a now infamous date which is October 7th, 2023. This is because on October 7th, 2023, a terrorist group within the Gaza Strip called Hamas launched an attack on an Israeli music festival called the Tribe of Nova Festival in Re’im, Israel. And this attack was brutal. Hamas killed over 1,200 people who were mostly Israeli civilians. Thousands more who attended the concert were terrified and caught in the crossfire of the newest cycle of violence between Israel and occupied Palestine. In response to this attack, Israel's Prime Minister Benjamin Netanyahu authorized an all-out siege on the Gaza Strip. Which as of recording, at the end of January 2024, has claimed the lives of over 26,000 Palestinians including over 10,000 children.

This most recent cycle of violence between Palestine and Israel has captured the attention of the world in a way that is unprecedented. Because contrary to what has become commonly said, the conflict and the humanitarian crisis in this region did not begin as a whole on October 7th, 2023. It goes back over seven decades to the founding of Israel, which Palestinians call the “Nakba” or catastrophe. In fact, many Palestinians have coined the phrase “100+ days and 75 years” to shed light on the true timeline of Israel's assault on them—which includes but is definitely not limited to—land dispossession and occupation, generations of Palestinians that were born into lived and died due to this conflict, a total blockade of autonomy, of any movement by air, by land, by water, forced starvation and water deprivation cycles, and campaigns of intense aerial bombardment, and more.

So…how does all of this conflict affect the environment in Gaza? Aside from all the physical damage from the aerial bombardment that we can all see with our eyes, there is another invisible cost to Israel's genocide and that is its carbon footprint. According to a report published in the Social Science Research Network, Israel's bombardment on the Gaza Strip in just the first two months of this genocide has produced more planet warming gases than 20 climate-vulnerable nations do in a year. Again, in just the period of the first two months, the total emissions from Israeli war activities calculate to an equivalent of 281,315 tons of carbon dioxide being released into the year. This figure includes combined emissions from bombs, rockets, artillery, flight times for bomb raids, the delivery of war equipment via cargo jets, and more.

To make a very futile attempt to contextualize this value, this is roughly the equivalent of 75 coal-fired power plants operating for a year. The report also highlights the very significant power imbalance between Israel and Hamas based on the sheer number of bombs used by each side. It states that quote, "these numbers also demonstrate the asymmetry of offensive weaponry in Israel's assault on Gaza." In the initial assault on October 7th, and for several weeks following the start of Israel reprisals, Hamas fired around 9,500 rockets. The total carbon pollution from those rockets is at least 713 tons of carbon dioxide equivalent. Meanwhile, over the first 60 days of combat, Israel fired around 2,000 artillery rounds per day, summing to approximately 100,000 shells. The total emissions associated with the munitions of Israels Bombardment are over 12,000 tons of carbon dioxide equivalent.In other words, not only is Israel completely devastating a tiny 25-mile strip of land with its aerial bombing campaign, it is doing so relentlessly, disproportionately, and it is at a grave cost to the environment.

So in all, the situation in Palestine is gruesome. As I've mentioned, it's the most documented humanitarian crisis that the world has seen play out in real time, which is largely thanks to the rise and connectedness of the internet. But if I've learned anything over the past 116 days of witnessing this genocide play out, it's that, Palestinians are a very, very resilient people. And like them, I hold stubbornly and steadfastly, that one day Palestine will be free.

Alright, now let's continue our journey. From historic Palestine, we're going to head about 2,600 miles southwest to the Democratic Republic of the Congo.

Part 2: Mining in the Democratic Republic of the Congo

The DRC is a landlocked country within the Congo Basin of Central Africa. It shares borders with many countries, including—are you ready? The Republic of the Congo in the northwest, Central African Republic to the north, South Sudan to the northeast, Uganda, Rwanda, Burundi, Tanzania in the east, Zambia to the southeast, and finally, Angola to the west.

Since the DRC straddles the equator, its climate is largely characterized by the climate of tropical rainforests, monsoon cycles and savannah climactic patterns. However, the climate varies across the country's massive range. For instance, it tends to be hot and humid in the north and west, which make up a significant portion of the Congo river basin. But in contrast, the southern, central and eastern sides of the country generally tend to be cooler and drier. Far as biodiversity goes, the DRC is home to an exceptionally high degree of it. It spans a plethora of biomes, ecosystems and habitats, notably consisting of dry rainforests, open woodland forests, savannas, cloud and gallery forests, and more. And if you can't picture these ecosystems that I'm mentioning, I highly recommend you get on Google and look up pictures of them and then subsequently stare at your computer or phone in awe, because they're gorgeous.

The country also serves as the only home to a number of iconic endemic species, including the okapi, which is an animal that kind of strangely looks like the hybrid of a giraffe and a zebra, the critically endangered eastern lowland gorilla, the endangered bonobo, which is also called the pygmy chimpanzee, and the vulnerable Congo peafowl. According to a report by the United Nations Educational, Scientific and Cultural Organization, or better known by its acronym, UNESCO, the DRC is the fifth largest country in the world in terms of forest cover, and the largest in all of Africa. Its forest cover represents more than 62% of the Congo forest, which together comprise the second largest block of tropical forests in the world. The first, of course, is our beloved Amazon rainforest. But it is for this reason that the Congo forests are literally referred to as the second lung of the planet. In addition to its nearly incomprehensible swath of forested lands, the DRC also has over 80 million hectares of farmable land and over 1,100 listed minerals and precious metals. The country in all has a significant natural resource

base of timber, energy, minerals, [and] gemstones. And all of those, unfortunately, serve the basis of the current conflict.

So, we have arrived at the dreaded question, what is happening in the Democratic Republic of the Congo? For starters, the DRC…it's a country that's been plagued by many conflicts that have been both civil and international. The conflict that this episode focuses on revolves around the exploitation of Congolese mineral resources. The DRC is home to some of the world's largest reserves of metals and rare earth minerals that are used to produce advanced electronics, namely cobalt, colton, and most recently, tin ore—to name a few. According to New York Times, Congo is a source of more than two thirds of the world's cobalt. Cobalt is a silvery blue transition metal that is necessary for the production of rechargeable batteries, mostly for electric cars. Another report by the Global Forest Coalition names colton as a conflict metal in the DRC. Colton is short for columbite tantalite, which is a dark gray metallic ore that is capable of storing electric charge. For this reason, it is fundamental for the production of electronic devices such as smartphones, laptops, gaming consoles, etc. The turn of the 21st century brought the proliferation of mining operations in the DRC. Nowadays, China controls more of the mines, but America opened its first cobalt mine in the DRC back in 2009. But actually, that doesn't mean that US interest don't go all the way back, because US interests in Congo's minerals go all the way back to World War II.

If you want a gruesome but related aside to this, uranium mined in the DRC was ultimately used in the atomic bomb that the US dropped on Nagasaki and Hiroshima, which I thought was insane. Like, that gave me perspective on how long the US has had its metaphorical fingers in the DRC's pot of mineral resources. Anyway, back to Congo.

Mining operations in the DRC have plagued the surrounding communities with violence, disease, displacement, and environmental degradation. Amnesty International published a report back in 2016 titled "*This is What We Die For" Human Rights Abuses in the Democratic Republic of the Congo Power the Global Trade and Cobalt.* The report outlines many human rights abuses that Congolese minors face which are including but not limited to: child labor, debilitating disease of the lungs from the mining itself, sexual violence against women and girls, and more. A similar report published by the Global Forest Coalition highlights how the mining of cobalt, colton and tin in the DRC, quote, "destroys forest ecosystems that provide sustenance and have cultural and religious value and erodes local

land rights." I don't know about you, but knowing that multiple countries thousands upon thousands of miles away control massive mining operations that cause massive deforestation in a country that is considered the second lung of the planet? Maybe just a *tiny* bit existential crisis-inducing.

But if that wasn't enough, mining in the DRC also negatively impacts the country's clean water resources. The U.S. Agency for International Development, or better known by its acronym USAID, published a Water Resources country profile for the DRC which states that quote, "Intensive mining has increased levels of trace metals and toxins such as lead, copper, cobalt, chromium, cadmium, zinc, iron, arsenic and cyanide in surface waters near active or abandoned mines in the South." It also states that quote "Sediment samples from rivers receiving mining effluent showed that copper, cobalt and lead values exceeded recommendations set by the Sediment Quality Guidelines for the protection of aquatic life by a hundred times to a thousand times. High metal and toxin levels from mining in the Katanga Province poses risks to aquatic ecosystems, but studies on local impact are limited." So, mining in the DRC…it's a complicated issue. In all, it's a conflict stemming from the control of natural resources, and it's especially concerning because if history shows anything, struggles for natural resources are often the enabling force for aggressive and long-lasting colonialism and western imperialism. And that's not me just talking out of term or making stuff up, Belgium literally colonized Congo back in 1908 for its natural resources. So, yeah.

The world's reliance on natural resources like precious metals that the DRC has, has only increased as time has gone on. And as that reliance continues, conflicts and human rights abuses like what is happening in the DRC, which is dubbed a silent genocide, are also sure to continue.

Okay, so with that being said, let us conclude our journey on the African continent by traveling about 1,300 miles northeast to the country of Sudan.

Part 3: Civil War and Waterborne Illnesses in Sudan

Sudan is a nearly landlocked country in northeast Africa. It has access to the Red Sea in its northeastern corner, and it also shares borders with multiple African countries including Egypt to the north, Eritrea to the northeast, South Sudan to the south, the Central African Republic to the southwest, Ethiopia to the southeast, Chad to the west, and Libya in the

northwest. Sudan characterized mostly by hot desert climate patterns with the southern portion of the country having hot semi-arid climate. It lies at the crossroads of Sub-Saharan Africa and the Middle East. Fun fact about Sudan that I found out did my research. The White and Blue Nile River tributaries meet in the capital city, which is Khartoum, and they merge to become the Nile River that flows all the way out to the Mediterranean Sea via Egypt.

Which like, okay—can we pause for another quick aside? Have you ever tried to follow a stream or a tributary of a major river all the way to the main river and then all the way out to sea? If you haven't, I highly recommend getting on Google Maps or Google Earth and looking up Sudan and trying to follow the Nile from Khartoum all the way to the Mediterranean Sea. Because I did so in my research for this episode, and number one, it was just fun, and number two, it kind of felt like a full circle moment. Because if you remember, Gaza is a coastal enclave on the coast of the Mediterranean Sea. So, like look at that geography.

Okay, anyways, back to Sudan.

To the north, Sudan has what is called a Sahelian Belt, which is a biogeographic region. It's characterized by acacia shrubs and acacia trees and a grassy savannah ecosystem, which, if you can't picture a savannah ecosystem, um, think of the landscape in the background of the Lion King, and you got it. Sudan also has a very fertile land for agriculture along the Nile Valleys. And actually, speaking of savannahs and acacia trees, the acacia trees of Sudan are actually very important for not only the ecosystem health, but also for economic prosperity for the country. According to the International Trade Administration, along with Sudan being the world's largest exporter of other oily seeds, which includes sunflower seeds, soybeans, sesame seeds, and others, it also produces over 80% of the world's gum Arabic, also known as acacia gum. And if you were like me and you're like, “what the heck is acacia gum? I've never heard of this,” It's a natural gum consisting of the hardened sap of two different species of acacia tree that are native to Sudan and it's a very important input in food additives as like a fiber source or a relief from ailment. Um, it's used in paint products as a binder, it's used in cosmetics as an emulsifying agent, and more. So, a pretty important economic resource.

When it comes to biodiversity, Sudan is home to some of the world's most iconic species of megafauna, including lions, leopards, cheetahs, elephants, giraffes, rhinoceroses, and multiple

species of antelope. I have to say, in my research, it was extremely difficult to find reliable and current information about the status of biodiversity in Sudan. In fact, most of the sources I came across were created before South Sudan gained independence from Sudan in 2011, which meant that most of the information I did find was a little over a decade old at this point. I'm going to return to this point of not being able to find a lot of information later on in the episode, but for now, I want to move into the conflict section of our exploration of Sudan.

So here for a last time, we find ourselves asking, what is happening in Sudan? Well, like Congo, Sudan is a country with a long history of conflict. It has two separate civil wars and a recognized genocide in its western region called Darfur under its belt. And now, Sudanese citizens are being afflicted by yet another conflict between two opposing factions of its military government. So, if we were to pause here and also Google just quickly what's happening in Sudan, you would come up with this:

On April 15th, 2023, a war commenced between the Sudanese armed forces, which are called by its acronym SAF, and the paramilitary Rapid Support Forces, which also by its acronym RSF. The war broke out in the capital city, Khartoum, and neither side is perfect, but the RSF is overwhelmingly considered the aggressor in this conflict. Again, this is a complicated history. So, at the very basic level, this conflict is born out of a disagreement about who has control of the military government. But like Palestine, this is just the most recent cycle of violence in Sudan because the violence that's plaguing the country did not start as a whole on April 15th, 2023. The fighting between SAF and the RSF was a conflict that was both feared and foreseen by Sudanese citizens and the international community who saw a series of clashes and coups as omens for a more encompassing war. In other words, it was kind of one of those it's a matter of time kind of situations.

In 2019, Sudanese citizens organized a two month long sit-in protest. The purpose of the protest was to pressure the then-president (dictator in parentheses) Omar al-Bashir, to step down and give ruling power to the civilians. The sit-in was a success in that Omar was eventually ousted. But the ruling power did not go to civilians, and instead, went to both military generals of SAF and the RSF who claimed that they together jointly would form a transitional government. Sudanese people were basically like, “uh, uh, that's not what we asked for,” and they persisted in their protest because they were adamant that the power be given to civilians. But then on June 3rd, 2019, the RSF raided the peaceful protest and killed

128 innocent unarmed Sudanese citizens. RSF army members also raped seventy women that were participating in the protest. The talks between SAF and the RSF regarding a transitional government quickly fell apart after the RSF raided the sit-in. And largely, the atrocity committed by the RSF on June 2019 kind of led up to the breakout of fighting in April 2023.

As of recording at the end of January 2024, Sudan is now the largest example of an internal displacement crisis. Just over nine million Sudanese citizens are internally displaced to other parts of the country. Because keep in mind, this war started in the capital city of Sudan, which was home to between 6 and 7 million people when this began. Additionally, the UN is reporting that more than 13,000 people have been killed, another 26,000 injured, and roughly 25 million people in need of humanitarian assistance and support. The war in Sudan is affecting Sudanese people in ways that we've discussed before. Unnecessary death, destruction of cities and homes, displacement, sexual violence, etc. However, the environmental impact I wanted to zoom in on for Suzan is how the war is impacting water resources in the country, and specifically, how this war is causing a massive cholera outbreak.

If you don't know, cholera is a nasty bacterial disease that causes some of the most uncomfortable symptoms you can imagine like diarrhea, vomiting, and chronic dehydration. According to Relief Web, close to 10,000 suspected cases of cholera, including 275 associated deaths, were reported as of the 20th January 2024 from 60 localities and 11 states. This emphasis on war causing the emergence of a waterborne disease outbreak intrigued me while I was researching for this episode. According to the National Library of Medicine, quote, “cholera is caused by the bacterium *Vibrio cholerae*. It is a disease that seems to be particularly sensitive to conflict and deserves more consideration. Major risk factors for cholera include poverty, overcrowding, poor hygiene, contaminated food, the lack of safe drinking water, etc.—largely resemble the consequences of war and civil fighting. Yet little is known about the relationship between cholera and conflict. This lack of information may be because cholera tends to be epidemic, affecting hundreds of thousands of people across vast war-torn regions, making it impossible for local governments, non-organizations and aid workers to control, let alone collect and analyze data.” So, do you remember earlier when I said that we would return to my point about finding largely outdated information when it came to Sudan? Well, here we are. We're about to make a full circle.

Part 4: Closing Remarks

I have intentionally chosen to end this episode exploring Sudan's conflict and subsequent environmental impacts because I believe that it embodied the purpose and intention that I had for this episode. Which to reiterate, my purpose was to explore the intersection of armed conflict and genocide and its impact on the natural environment. So, color me shocked that in the year 2024 on the World Wide Web I couldn't easily find credible information about why the link between cholera and conflict hasn't been established. And why could I not find out for sure what flora and fauna embellished the Sudanese land? I was questioning why this information wasn't easily accessible or easy to verify, and I ended up coming across this article written by Ahmed A.H. Siddig at the University of Khartoum and is titled *Biodiversity of Sudan: between the harsh conditions, political instability, and civil wars.*

In this piece, Siddig says, quote, “because conservation in general needs committed governments, people living in a safe and healthy environment, and available resources, it is not surprising that the issue of biodiversity conservation is a low priority in Africa.”

And here, dear listeners, if you've made it this far, is where I would like to begin concluding today's episode. As I hope I've illustrated through these contemporary case studies, war harms not only people, but the environment that people occupy too. War and genocide not only preclude basic human rights, but also, it largely precludes the scientific process. As Siddig points out in his piece, conservation and science in general requires committed governments and happy, healthy, *safe* citizens to happen in the first place.

Scientists can't define the link between waterborne illnesses and war if they are in active war zones.

Conservationists can't advocate for or make conservation plans for forests that make up the lungs of the earth if they are in active war zones.

Doctors can't perform life saving measures for people in active war zones.

Any one of the tens of thousands of people that were killed or maimed in these conflicts could have been those scientists, conservationists, or doctors. They could have had the answers to science's most pressing questions. They could have held the key to cures. They

could have been the authors of papers detailing breakthrough discoveries in medicine or novel solutions to climate change. And unfortunately now, the world will never know what those people could have done for it. The world will never know what those people could have done for us.

So if you take anything from today's episode, let it be this. As long as there is war and human rights atrocities happening *anywhere* to *anyone* for *any* reason, not only do people suffer, but the advancement of science suffers in one way or another as well.

I know that today's episode was a heavy one. So I struggle to say my usual "I hope you enjoyed" kind of talk. But what I will say is that I hope you learn something from today's episode. Or maybe you considered something in a new way that you hadn't before. As I said at the top of this episode there is a plethora of links provided in the show notes for further reading. I even broke them down into the country that they're related to, so they are links specifically for Palestine, for Congo and for Sudan. I've also included three interactive infographics that you can click on to find primary sources and organizations covering information for each of these places in the show notes. So please utilize those resources and consider sharing this podcast with a friend or two. Word of mouth is an incredibly powerful tool, and this episode in particular—[while] trying to do it care and justice—took a very long time to create. If you've made here to the very end, from the bottom of my heart, I just want to say thank you so much for listening and I will talk to you next time.