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War and siege inflicted damage on Tigray's ecosystem

22 February, 2023 • Emnet Negash, Emiru Birhane

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Continued ecosystem damage could eventually make Tigray part of a wider desert connecting the Sahel to the Afar Triangle, a scenario which may render the area uninhabitable.

Over the past century, many civil and inter-state wars have

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biodiversity loss and overfishing.

Despite long-standing protective mechanisms, including [Article 54](#) of the 1977 Protocol of the Geneva Conventions, it is not an uncommon phenomenon for armies to strategically target [agriculture](#) and other [natural resources](#) during wartime.

The war in Tigray has not been an exception in this respect.

While the region's population endured a [medieval-like siege](#) and suffered a [humanitarian catastrophe](#) in which an estimated 2.6 million people were [internally displaced](#) and [311,000 to 808,000](#) civilians perished, the land sustained immense environmental damage.

This has not received enough attention, understandably, due to people's higher sensitivity towards the overwhelming devastation to human lives and livelihoods. In an attempt to raise awareness, this piece leverages data, such as satellite images and field observations, to describe the damage the ecosystem has sustained.

Land Restoration

Tigray is a [desertification hotspot](#), encircled to the west and northwest by the Sahel and to the east by the Afar region, which itself comprises one of the planet's most hostile environments.

Mainly aimed at averting desertification, land restoration has long been one of the main policy pillars in the region. To this effect, farmers spent over twenty days of free labor yearly for the last three decades, implementing a wide array of measures such as building terraces, planting trees, protecting restored sites, and constructing irrigation schemes.

The restoration policy made landscapes [greener](#), bringing evident positive changes both at the ecosystem and household levels. These efforts earned Tigray the UN-backed [future policy award](#) in 2017.

On top of this, the village of Abraha-We-Atsbaha won the [Rio 2012 Award](#) for its exemplary work on green development, Mitiku Haile received the [GCHERA agricultural prize](#) for his role in supporting the restoration efforts, and [Haregu Gobeza's](#) testimony was internationally acclaimed for the sustainable agricultural practices she helped spread.

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Armed conflict has degraded Tigray's forest resources

War in Tigray has destroyed decades-long vegetation restoration efforts.

- by Mistir Sew

Over the last three years, these life-changing and award-winning land restoration practices, which include soil and water conservation, establishment of exclosures and tree planting, have been interrupted. Labor mobilization was not possible in 2020 because of the COVID-19 pandemic, while in 2021 and 2022 work on such projects was discontinued because of the war.

With the three decades long efforts and the vision underpinning them abruptly washed away, the dream of building a climate-resilient green economy is seemingly lost.

Wartime Disruptions

The Tigray war started towards the end of the rainy season, when farmers were preparing to harvest their produce. It is estimated that over **90 percent** of the produce from the main harvest season of 2020 was either destroyed, burned, left on the field, or looted.

Particularly in western, northwestern, and southern Tigray, it is customary at that time of year to assemble animals from the highlands together in the lowlands. This practice facilitated the widespread looting and slaughter of the gathered herds by Ethiopian and Eritrean forces.

Few in number, unarmed, and frequently attacked, herders had no way to protect their animals. Moreover, conditions prevented them from collecting animal feed to be used for the dry season.

Finally, seedlings planted in June 2020 as part of the ongoing land restoration efforts in the early stages of establishment were easily trampled by troops and the large machines in motion.

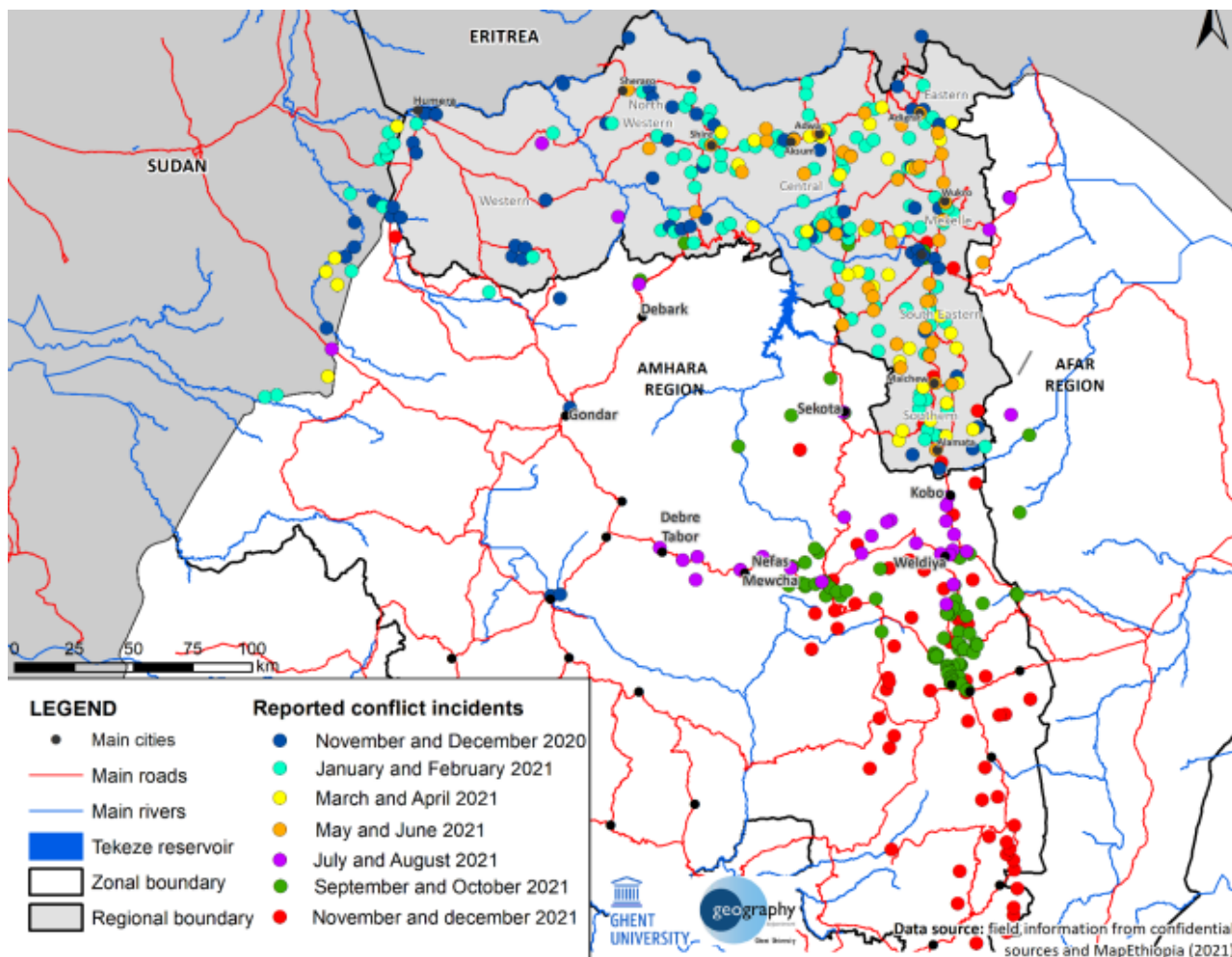
The cumulative effect of these shocks was that farmers immediately lost their means of subsistence. They soon were forced to **eat tree leaves** and branches, eking out a living from Tigray's forests.

Prevented from accessing agricultural inputs such as seeds and fertilizer during the following two years of war, their situation has only deteriorated since.

Ravaged Landscapes

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Reported conflict incidents from November 2020 to December 2021. © [Tigray: atlas of the humanitarian situation](#).

Among the many pieces of evidence on this count, images circulating on **social media** and geolocated at Hitsats, a village west of Shire, show at least 225 hectares burned.

While some wartime damage may have been incidental, certain actions by the invading forces were clearly targeted to destroy Tigray's natural environment. According to the Tigray Bureau of Agriculture and Natural Resources, these include the destruction of 237 seedling nurseries and the rendering of many more inoperable in order to hamper landscape regeneration.

Not even sacred land was spared. Forest reserves in and around Waldiba monastery were exploited after the monks who guarded them were **killed or displaced**.

As shown by Conflict and Environment Observatory (CEOBS) satellite-based **analysis**, church forests, which were once thought to be under God's protection and thus off limits for resource extraction, were ravaged by intruders from neighboring Amhara and Eritrea, as well as by locals desperate for an income.

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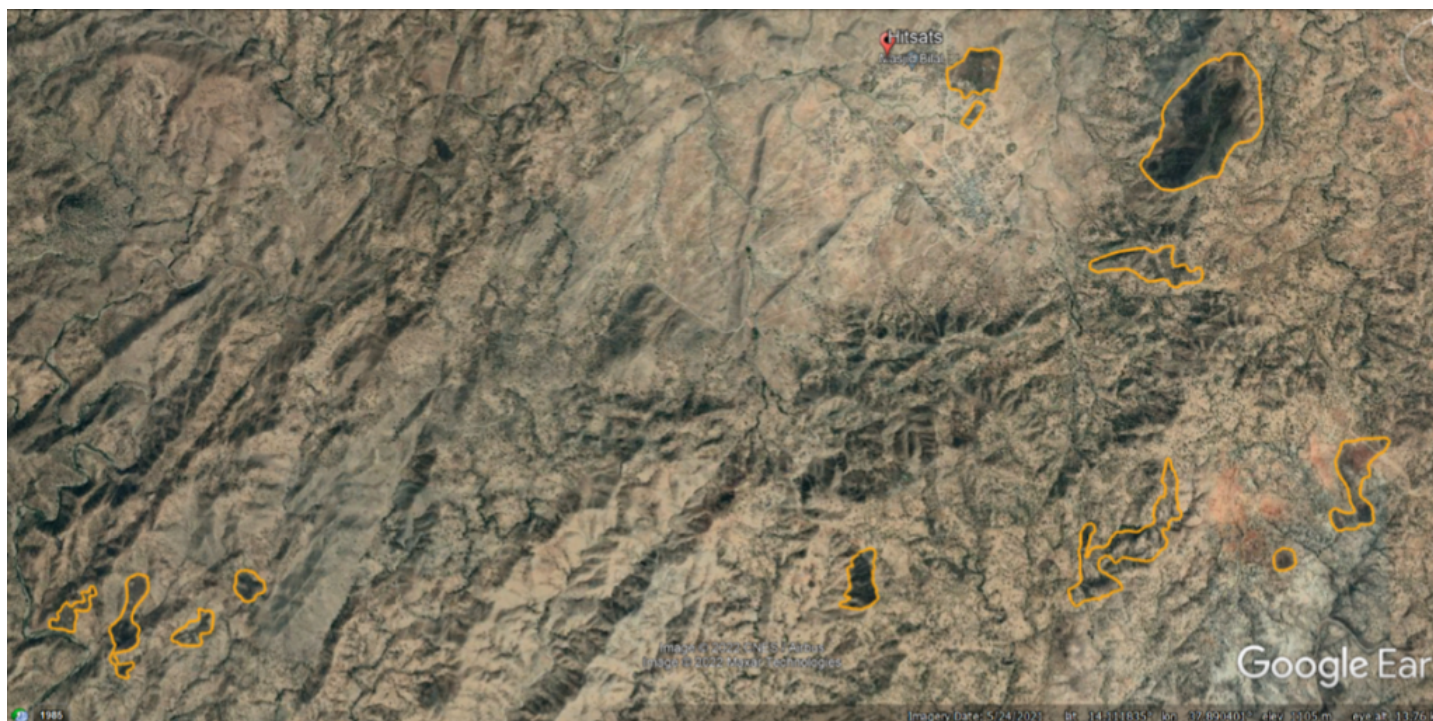
Tigray's once-thriving agriculture sector has been purposely destroyed

Six Tigrayan agriculture experts in Mekelle call for international pressure on the Ethiopian government to allow in necessary agricultural inputs.

- by Mistir Sew

Episodes like these likely number in the hundreds and spread throughout Tigray, but unfortunately no comprehensive assessment of this type of damage has been done so far.

Even when not explicitly targeted, nature was always a silent victim. For example, because the dry Afromontane forest landscapes characterizing the region were favored both as offensive and defensive positions, many ditches, bunkers, and temporary roads were built there. This type of preparations and the movements of troops—disregarding the protected status of conservation areas—had a terrible impact on the natural environment and on biodiversity.



Marked in orange are areas seen burned in late 2020 around Hitsats refugee camp. © Google Earth

Siege's Impact

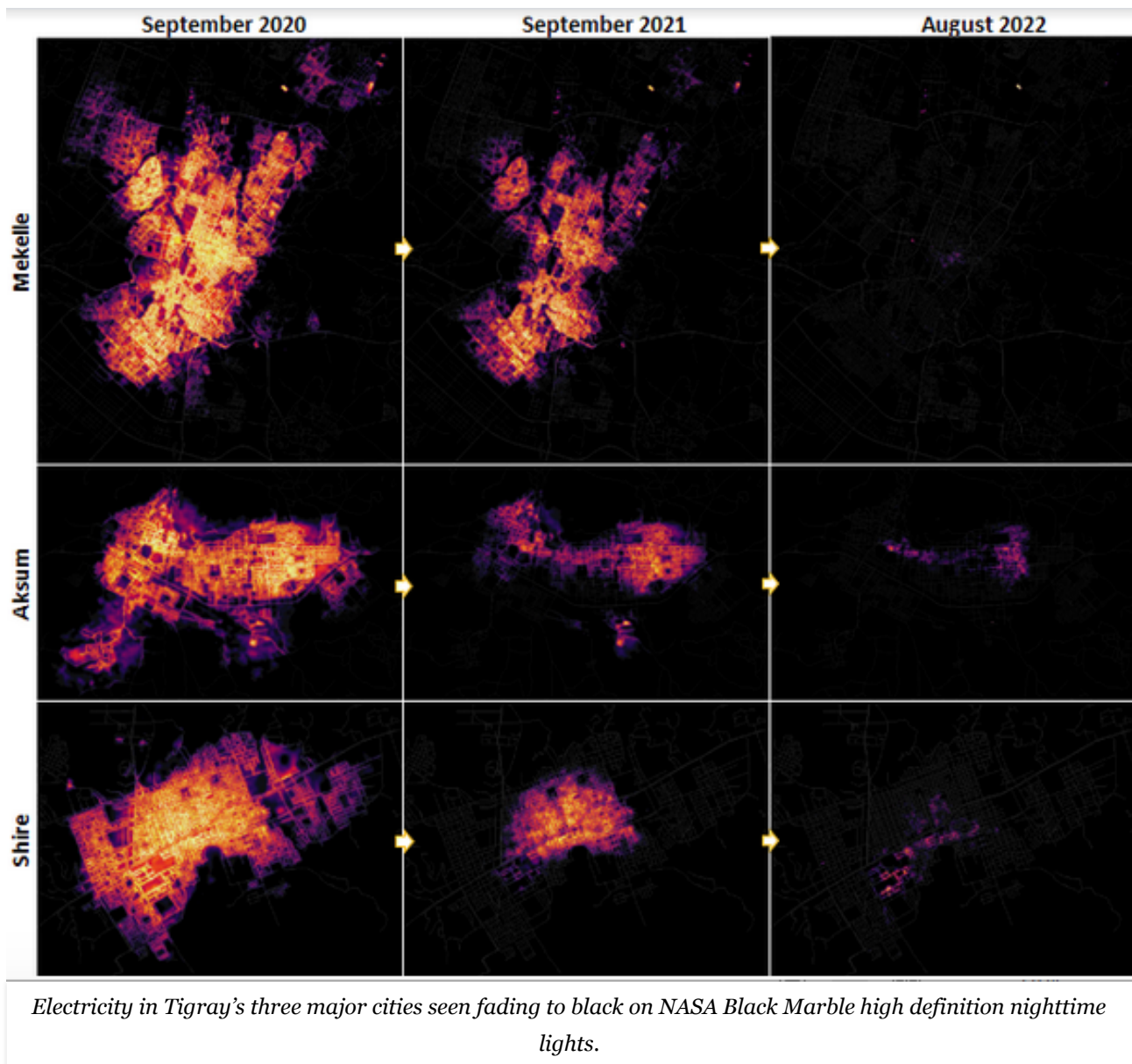
For the better part of the war, Tigray's population has been denied access to essential **public services**, including to the national electricity grid.

The substitute power supply from the Tekeze Dam, the only hydroelectric power source in the region, was not only insufficient but also was damaged by **aerial bombardments**. Since it was not possible to import spare parts to repair it, access to electricity went from bad to worse.

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electricity supplies were effectively shut down.



In the absence of electricity and fuel, whose shipment to the region were also prevented, households were forced to shift to alternative energy sources such as firewood and charcoal for cooking, heating, and other domestic uses.

To sustain themselves, people relied heavily on natural resources, including the remnant natural forests. Rare **footage** from central Tigray by the International Committee of the Red Cross shows a long line of women carrying firewood from the field, which is a testament to the extensive pressure on forests.

The evidence is not only episodic. A **CEOBS report** warned that Tigray's re-greening efforts have

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Forest areas closer to larger cities and towns are at greater risk due to the increased demand for firewood and charcoal. For instance, satellite images for an area east of Adigrat called **Koma Siwiha** show an entire hill, which before the war was green, that was completely deforested in a few months.

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Additionally, the recent forced shift to firewood and charcoal for domestic use has negatively affected human health, reversing the improvements in citizens' health and living conditions brought about by electrification over the past decades.

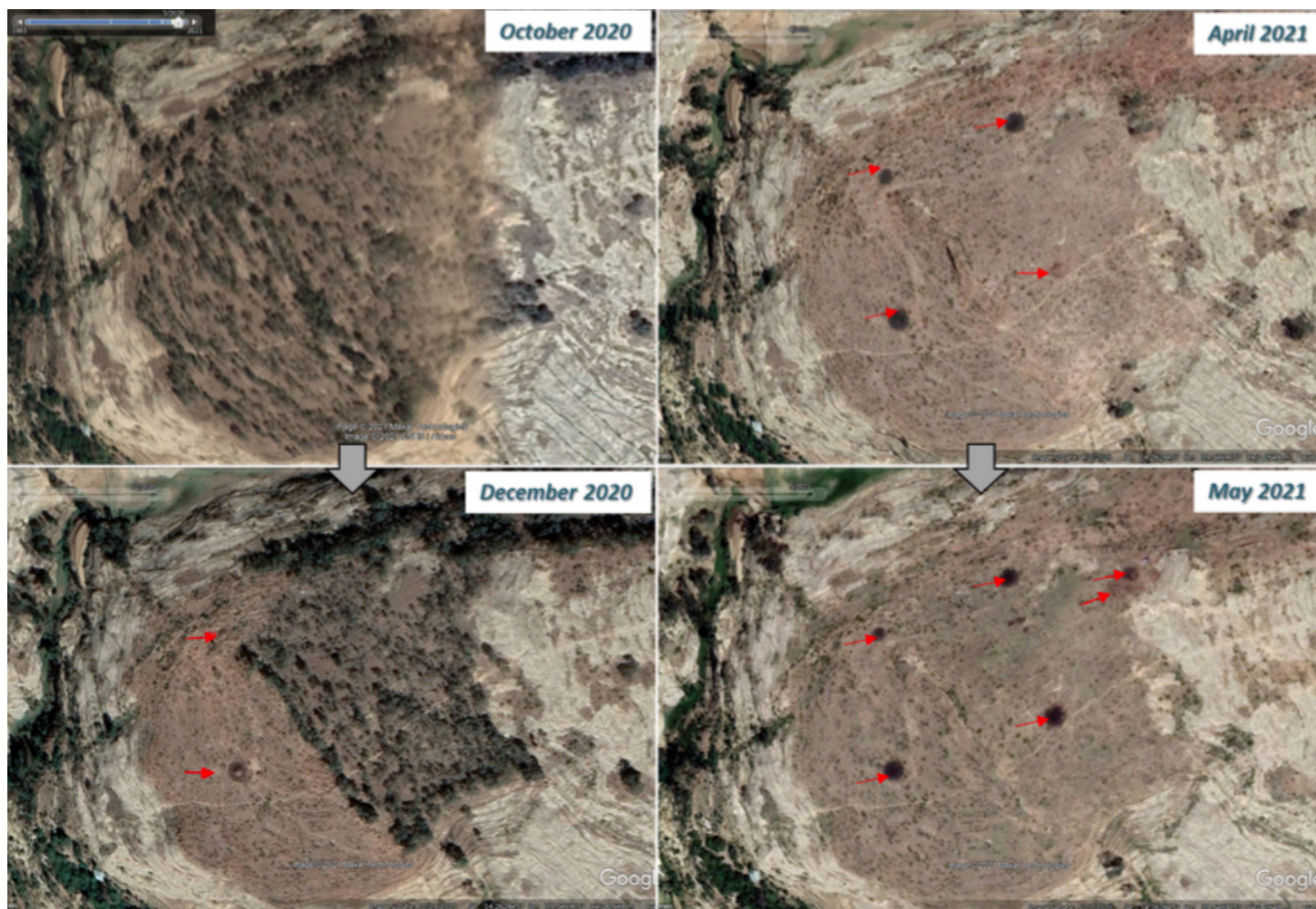
Smoke-related health problems are **on the rise** among women who take on household care. The burden on women has grown considerably as collection and transportation of firewood has been added to their daily tasks.

Consuming half-cooked or raw food has become a common practice, especially in urban areas and IDP centers, worsening the region's **health crisis**.

In a bitterly ironic twist of fate, a society that was awarded several prizes for its success in land restoration was forced to reverse its past achievements.

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A deforested hill, before and after the start of the war. Marked in red are charcoaling trenches. © Google Earth

Forest, Wildlife, and Climate

Many indigenous and flag forest species and wild animals were also severely affected by the destruction of their habitats during the war, which, coupled with increased hunting pressure, has likely wiped out entire species from the region.

One **documented** tragedy in this respect is the damage suffered by the only elephant sanctuary in Tigray, Kafta Sheraro National Park, from which elephants were displaced and many killed. Vehicles designated for the park were stolen, infrastructure was devastated, and wildlife was poached, with armed groups from neighboring Amhara even opening a bush meat restaurant in Adebay, a town located at the edge of the park.

Moreover, as wild animals were displaced from their habitats, they came in closer contact with domestic ones, leading to the spread of **rabies**, **anthrax**, and other epidemics. Despite the reports by doctors and patients, it is impossible to estimate the gravity of this phenomenon, as the lengthy communication blackout has prevented the collection of field data.

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Finally, the effects of large-scale destruction of natural resources are likely to affect atmospheric conditions in the region. Although the long-term impacts on the climate are yet to be seen, a few outcomes have already become apparent.

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The damage to conservation structures and the cutting of trees resulted in flooding in many cities and towns. Unable to cope due to the devastation inflicted by invading forces on sewage systems, several such episodes ended with loss of human life.

In fact, even though rainfall levels were not any different from previous years, the towns of Selekleka, Adigudom, and Maichew faced destructive flash floods that would otherwise have been easily controlled. At least ten inhabitants were **killed and many more injured** in Selekleka on 26 June 2022.

Policy Renewal

Unless the damage is soon reversed, these ramifications will only get worse over time.

Despite the magnitude and character of domestic environmental damage, Ethiopia is **sending** seedlings to neighboring states under its green legacy initiative.

This is not an exception, rather a continuation of the country's plans to **export food grain**. The hypocrisy of fostering international cooperation by promoting food security and providing environmental services while systematically and intentionally undermining these goals at home is striking.

Now that a **peace agreement** has been reached, federal authorities should reconsider their policies and prioritize Tigray's environmental concerns.

If time is wasted and there is a continuation of the ongoing ecosystem damage, Tigray could become part of a wider desert connecting the Sahel to the Afar Triangle. In such a scenario, the ecosystem would eventually become uninhabitable and force residents to migrate

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Tigray's painful experience shows that mounting international **demands** to make **mass destruction of ecosystems punishable** necessitate meaningful support.

Such a decision by the International Criminal Court would make actors responsible for funding, permitting, or causing severe environmental harm subject to criminal prosecution, hopefully preventing the repetition of behaviors like those detailed above.

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This is the author's viewpoint. However, Ethiopia Insight will correct clear factual errors.

Main photo: A mountains in Adwa; October 2016; Patrick Wight.

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Emnet Negash

Emnet is a PhD candidate at Ghent University in Belgium, and Assistant Professor at Mekelle University, Ethiopia. His research interests include climate, farming systems, and crisis monitoring.

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Emiru Birhane is a Full Professor of Ecology at Mekelle University and Director of the Institute of Climate and Society, Mekelle University (Ethiopia).

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13 COMMENTS



gebresemaeti kahsu

3 March, 2023 at 2:45 pm

Welldone Emnet & prof.Emiru.

[Reply](#)



Fanuel Emiru

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Well instead of digesting each other's confidence through insults and offensive comments, we could all discuss for the recovery of this phenomenon. What happened has already happened, whose ever fault it is? Identifying the villain would never solve a thing, so lets be humble and try to bring peace all over the place.

[Reply](#)**Tekle**

25 February, 2023 at 4:28 am

This is one of the most important elements or aspects to deal with whenever analyzing the effects of Tigray war is being considered the fact that the majority of analysts will continue to land on the humanitarian damages. However, the ecological catastrophe will last centuries deepening the damage to generations to come. You deserve many thanks for this well-structured elucidation.

[Reply](#)**Jumbo**

24 February, 2023 at 8:24 pm

Tplf mismanagement, corruption, & dysfunction at its finest.

Weyane waging war against Ethiopia in Nov 2020 has only exacerbated the problem.

Begging the West for food aid will only continue, for the foreseeable future

[Reply](#)**Alem**

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[Reply](#)**Eden R.**

23 February, 2023 at 7:39 pm

Instead of spending millions buying weapons, Tplf could have invested in agriculture. Now you have lost both your farms and youth.

[Reply](#)**Humanitarian**

23 February, 2023 at 9:17 pm

That's a MISINFORMATION attempting to undermine crimes against humanity carried out against Tigray as usual

[Reply](#)**Davey McCrackett**

24 February, 2023 at 9:49 pm

Eden R, that is an idiotic comment. For one, it is the Ethiopian govt who has been spending 80% of its budget on weapons. TPLF just took what Ethiopians gave them fir weapons. 2, it is the siege and over-the-top destruction by Ethiopian army, Amhara militias abd Eritrean army tgat dud tge damage. Yiu want to blame TPLF for something Ethiopia and Eritrea Chose to do, very few would agree with that. Mark well that these actions were a choice. A law and order operation surely would not punish the very people it is purporting to save. There was no reason for the widespread destruction, looting, siege etc except to hurt Tigrayan people. In fact, the TPLF is not hurt at all. It is the people suffering, not the leaders. It is people in Amhara, Afar, Somali, Oromia, BenishangulGumuz, etc, all Ethiopian peoples who have suffered from all leaders actions. Best would be to rid yourselves of PP and TPLF and all other fed govt and regional govt officials

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**Tekle**

28 February, 2023 at 9:03 pm

What a curse for every evil happened your reply is TPLF.

[Reply](#)**Humanitarian**

23 February, 2023 at 4:06 pm

Heartbreaking to see this not accidental but international destructions. Ethiopia destroying Ethiopia & promoting poverty & famine. Then, declaring to the world news of wheat export – Whom ARE WE FOOLING? So foolish is the state of Ethiopia today & incompetency

[Reply](#)**Mehari Girmay**

23 February, 2023 at 2:07 pm

Dear Prof. Emiru and Emnet!

I sincerely appreciate your concern and efforts to raise these critical issues. However, this will be a tinny threshold in comparison to what has happened and what is occurring on the ground. I am adamant about digging deeper and moving forward with its implementation.

As an ecologist, I'd like to work alongside you.

Your's

Mehari Girmay (PhD)

Ass. Prof. in Plant Ecology and Biodiversity mgt.

[Reply](#)

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Tigray landscapes demand fast recovery and restoration. Exemplary analysis

Reply



hagos kidanemariam

22 February, 2023 at 10:25 pm

Nice job prof. Emru, ass. Prof nd post doc. Emnet

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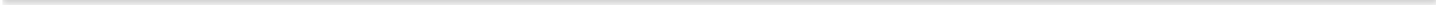
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