Life in Darkness:
The Communication Blockade during the Tigray Siege

T.G. Gebreslassie, Gebru Kidanu, Liya Mamo, S. Y. Amare & Mirjam Van Reisen

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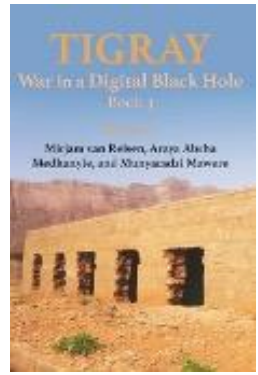

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Chapter 3

Life in Darkness:

The Communication Blockade during the Tigray Siege

T.G. Gebreslassie, Gebru Kidanu, Liya Mamo, S. Y. Amare & Mirjam Van Reisen

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Either share mutual affection and laughter, or part in enmity.

Abstract

This study investigates the phases and characteristics of the siege and communication blackout in Tigray during the 2020–2022 war. Employing concepts such as 'information black holes', social identity theory, and the theory of critical transition, the study delves into how the communication blackout and siege impacted on people's mental states and societal structures. The research outlines five distinct phases of the siege, and throughout these phases, the degree of control over communication and the severity of the siege varied significantly. The analysis highlights how the blackout exacerbated the siege's impact, altering Tigray's social identity and fostering a 'we versus them' mentality. It underscores the transformative societal changes, reconfiguration of social dynamics, and the emergence of self-reliance within Tigray. The study reveals the implications of the digital divide resulting in innovative solutions developed to maintain communication and data sharing under restricted conditions. These findings suggest a potential shift towards federated digital infrastructure, minimising dependency on central digital systems and enhancing digital resilience in future crises.

Keywords: information black holes, resilience, digital resilience adaptation, social identity theory, Tigray war

Introduction

Following the start of the Tigray war on 3 November 2020 (ICHREE, 2023), the federal government cut Tigray's connection to the Internet, landline, and mobile phone networks and disconnected the region from the rest of the world (Gesesew *et al.*, 2021). Banks and other basic service providers that depended on ICT infrastructure for their operations shut down after the communication outage. Tigray was closed off on all sides; from Ethiopia on the East and South; from Eritrea in the North; and the Ethiopian federal government quickly secured closed access to the Sudanese border; it besieged Tigray from all directions (Al Jazeera, 2022).

As Tigray was besieged and inaccessible to anyone from outside, and communications from inside Tigray to the outside world were blocked, there was little to no information coming out of Tigray. The acts of the invasion, killings and atrocities committed, sexual violence and rape, vandalism of cultural heritage and economic property, looting, and – later in the war, on starvation remained hidden to the outside world (Tesfa *et al.*, 2024a; Tesfa *et al.*, 2024b; Kidanu & Van Reisen, 2024; Kahsay *et al.*, 2024; Gebremariam & Abrha, 2024; Kahsay, 2024). The communication blockade and siege in Tigray made it difficult for the international community to understand the situation. On 23 February 2021 EU Special Envoy, Haavisto held a press conference after visiting Ethiopia and stated, "that Ethiopia's leadership had failed to provide a 'clear picture' of the situation in Tigray – including the widely documented involvement of forces from neighbouring Eritrea" (Euractiv, 2021).

With the lack of access to information the international community had little understanding about the military actors operating in Tigray apart from information coming from the Ethiopian government, and from some sources from which the information was hard to corroborate. In his Press conference Haavisto declared: "'The question of Eritrean troops is extremely sensitive, so we don't get the clear answer about the whereabouts or magnitude of the Eritrean troops" (Euractiv, 2021). The governments of Ethiopia and Eritrea both denied that Eritrean forces were involved in the conflict, despite reports of widespread atrocities committed, and a massacre in Aksum

(Tesfa, Van Reisen & Smits, 2024). The denial of participation of the Eritrean military in Tigray was "contradicting eyewitness reports from civilians, aid workers and some military and government officials in Tigray" (Euractiv, 2021). To obtain clear information and set up support lines for the civilian population of Tigray, Haavisto called on the Ethiopian government to end the siege and "to provide full humanitarian access to Tigray, including areas beyond its control" (Euractiv, 2021).

Ethiopia has a long history of denying Internet service to citizens. Before the Tigray war, there were sporadic Internet shutdowns whenever there was civil unrest, election, or national exams. These Internet shutdowns were similar in intention and action to other countries' experiences (Pandow, 2021). In the Tigray siege, everything that worked that was not part of any national interconnected communication channel was prone to be cut by the federal government. The people of Tigray were isolated by a dysfunctional communication infrastructure and to live a disconnected life in an information black hole, in which all communication is controlled by the dominant group.

The effect of the communication blackout and siege on the people of Tigray, including its manifestations and societal impact, has not been researched. This study attempts to investigate the lived experiences of the Tigrayan people amid an absolute siege and communication blackout, which lasted two years.

The research question for this study is: *What are the lived experiences of the people of Tigray during the communication blackout that was enforced on the population as part of a siege during the 2020–2022 Tigray war?*

The sub-questions are:

- What are the feelings, thoughts, and perceptions of the Tigrayan people regarding the communication blackout in the context of the siege?
- How has the communication blackout during the siege affected the lives of the people of Tigray?

Theoretical framework

The concept of the information black hole sees the digital infrastructure as a social structure that is characterised by power dynamics. In the digital era, the amount of access to digital infrastructure is an aspect of power that can be exercised. If information access is suppressed or disabled, this creates social dependencies. Van Reisen *et al.* (2019) find that digital information black holes:

> .. *create a situation in which those living in them are dependent upon gatekeepers for information and cannot send information, or only with great difficulty. This establishes a social reality in which power relations control the information that goes in and out.* (Van Reisen et al., 2019, p. 23)

Van Reisen *et al.* (2023) find that access to the Internet is often repressed as a first measure in a strategy to gain control over individuals or a group of people. Consequently, the individual or group not only lacks access to the receiving information on the Internet, but the individual or group can also no longer send information. This means that such individuals or groups are locked and cannot share the information with others, and this hampers the possibility of sharing information on their condition, creating emotional bonds between people in similar conditions, limits the possibility for empathy, and undermines the possibility for solidarity with their situation (Van Reisen *et al.*, 2019). Following Rorty (Rorty, 1998), This could be an explanatory factor in the lack of sympathy received and affecting how those subjected to information black holes can be derived from their human right. Their right to exist is violated as they are unseen and unable to speak (Van Reisen *et al.*, 2023).

What are the metrics of an externally imposed information black hole in people's lives, especially during a siege and war? How do people react to this change and begin to adjust their lives both individually and collectively. Previous similar research that captured the lived experience of besieged people of Sarajevo identifies three fundamental constructs of mental state. These constructs are disbelief, adjustment, and dissent (Maček, 2009).

Disbelief: There is confusion and bewilderment that people experience following the impotence to escape the unprecedented sever conditions of war. The acts of atrocities, humiliation, darkness, and disgrace have driven many to question reality.

Adjustment: Adjusting to a rapid and frequent change of actions that produce new norms with economic and political shifts helps people comprehend reality and reflect on the moment of new truth by pursuing alternative knowledge.

Dissent: Facing reality and putting trust and truth to the test, whether to be a part of it or not, is always an issue of integrity. There is sometimes disagreement and a shift in viewpoints based on information and knowledge gathered on the ground.

These constructs were triangulated with the social identity theory. In Social identity theory, People have both personal and social identities. Personal identity is a description of a person's personality in terms of abilities and achievements. Social group membership, on the other hand, can express social identity. As a result, people self-identify and emphasise group membership based on factors such as race, gender, ethnicity, country of origin, and religion. People who are influenced by ingroup bias desire to believe that their group is positive and prefer their group over another. This ingroup bias can result in prejudice, discrimination, and conflict, amongst other things (Hornsey, 2008; Tajfel *et al.*, 1971).

The constructs of the social identity theory are social categorisation, social identification, and social comparison.

Social categorisation: Social categorisation involves organising individuals into social groups, to help them comprehend the social world. This process allows us to define people, including ourselves, based on the groups to which we belong. Collective threats are prioritised over individual threats. Emphasising the similarities within our group while highlighting differences between other groups is a common outcome of this categorisation.

Social identification: This is the knowledge that the person belongs to the formed group and sees the phenomenon as an action perpetrated to the formed group.

Social comparison: People compare their situation to that of other social groups that are in the out-group category.

These cognitive processes lead to creation of different groups based on the situation created, which will help understand how the siege and information blackout impacted the identity of the group (Vinney, 2019).

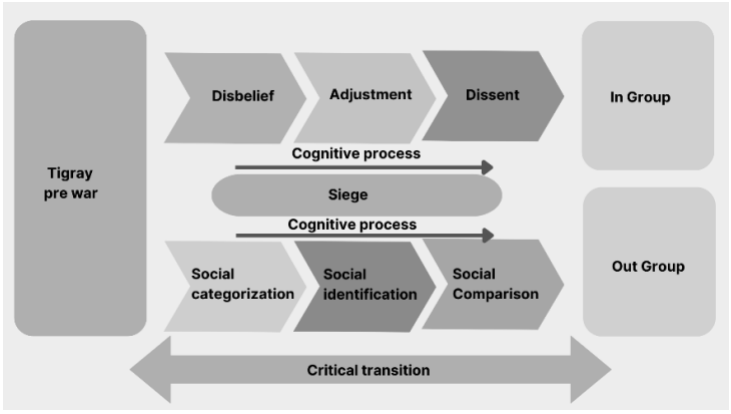

Figure 3.1. Critical transition in social identity because of siege

Another theory to help understand the findings of this chapter is the theory of critical transition. This concept serves as a framework for comprehending the dynamics of transformation in ecological and social contexts. The concept of critical transitions as defined by Marten Scheffer is a pivotal moment in a system's behaviour when it undergoes abrupt and significant alterations due to relatively small changes in its conditions or structure. These transitions often result in a shift from one stable state to another, sometimes accompanied by far-reaching and transformative consequences for the system's dynamics (Fisher, 2011).

The purpose of this research is to provide a clear and in-depth understanding of life under siege, as well as to assess the impacts and negative effects that a lack of communication has had on society.

Methodology

This study consists of two parts. In the first part the communication blockade and siege are described by analysing the entries on it in the

Europe External Programme with Africa (EEPA) Situation Report on the Horn of Africa, which systematically reported on the war in Tigray. In the second part, the findings of the interviews with participants (Internally Displaced People (IDPs)) in Tigray are presented.

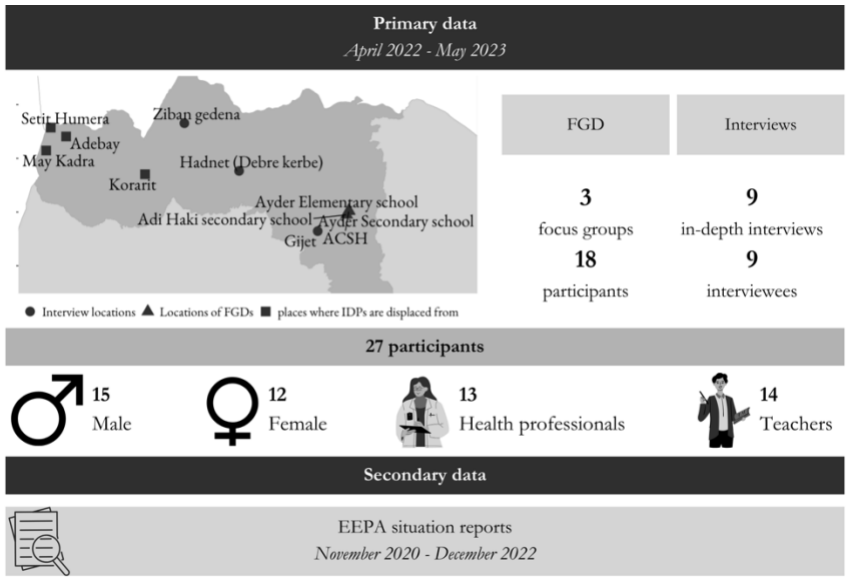

Figure 3.2. Overview of data collected and used in the study

EEPA Situation Reports on the Horn of Africa

In the first part we study how the information black out and siege was reported. In this part of the study, we analysed and identified siege and communication blackout daily updates from the EEPA Situation Reports on the Horn of Africa. These reports focused on the situation in Tigray during the entire period of the war. The reports are two-pagers published almost daily with key points updated on the situation in the Horn of Africa, with specific attention to the situation on the war in Tigray. The reports started on the 17th of November 2020 and were published until after the Cessation of Hostilities Agreement. The reports were sent to diplomatic missions, uploaded on social media, and sent to a listserv. The reports are still available on the EEPA website and serve as a record. The purpose was to ensure that information about the situation on the ground was available in the public domain, and available for further investigation.

For this study the EEPA Situation Reports covering the period November 2020 to December 2022 were considered. The reports were analysed with purposeful coding-labelling to identify the testimonies from Tigray which reported on the information blackout and siege. The data of the EEPA Situation Report is public and the spreadsheet in which the coding-labelling strategy was carried out, is stored by the researchers.

Interviews and focus group discussions

The second part of the research consists of interviews and focus group discussions. The research was carried out in Tigray, Ethiopia from January 2022 to May 2023. The data was collected between April 2022 and May 2023. Efforts were made to purposefully recruit participants who represent and cover the lived experiences of people from all over the region and from all walks of life, with a particular focus on teachers and health workers who have been internally displaced and are living in various towns throughout the region since the beginning of the full-fledged war. Internally displaced teachers and healthcare workers are members of a society that bears a double burden. They were at the forefront of serving and guiding a tremendous load of duties and responsibilities throughout the war. Furthermore, due to their profession, they are in a unique position to see and engage with a wide range of people and situations; for this and other reasons, they are knowledgeable about the life of the Tigrayan people under the siege and communication blackout.

To describe and understand the life of the Tigray people during the communication blackout and siege, an interpretative qualitative study design was used. This design guides in obtaining an understanding of how participants give meaning to their experience and supports analysis of their feelings and thoughts authentically and richly. The researcher focuses on the agency of the participants in the study. Agency refers to the ability of human beings to understand their situation and to act per that understanding (Emirbayer & Mische, 1998).

To document the participants' lived experiences, eight in-depth interviews, and two focus group discussions were conducted.

Twenty-seven teachers and healthcare workers from different parts of the region were selected for participation. These participants were from the Hadinet health centre in the Zana district, and Ziban Gedena health centres in the Tahitay Adyabo district in the North Western Zone, as well as a health centre in the Seharti district of the South-Eastern Zone and two primary and secondary schools from Mekelle called Ayder Elementary and High School and Hastey Yohannes Elementary and Preparatory School. The first focus group consisted of teachers who had been internally displaced from Western Tigray, divided into two groups depending on gender. The second focus group included healthcare practitioners who had worked throughout the war in various districts of Tigray and are now working on the Saving Little Lives project at Mekelle University.

Out of 27 participants, 12 were female and had an education level above an advanced diploma. The participants had more than three years of work experience. Participants were from all zonal administrations of Tigray including people displaced from the Western Zone and living in IDP centres.

Table 3.1. Socio-demographic characteristics of participants

Socio-demographic data		
Category		***Participants***
Sex	Female	12
	Male	15
Age	20–25	11
	>25 years	16
Occupation	Health professionals	13
	Teachers	14

Work experience	<= 5 years	16
	> 5 years	11

Questions for guiding the interviews were initially prepared in English and later translated to Tigrinya. A semi-structured questionnaire with probing questions was prepared; the questionnaire was initially prepared in English then translated into the local language Tigrinya then translated back to English by a translator to ensure language consistency.

A pretest was conducted among co-workers who met the inclusion requirements prior to actual data collection, and required adjustments were made to improve the methods employed based on important lessons learned from the pretest. The principal investigator was engaged in all processes including preparation of the interview guide, data collection, data translation, and transcription.

The research team used checklists and facilitated the process by trained investigators who were fluent in Tigrinya. The interviews and discussions were conducted face-to-face at the participant's preferred location. The in-depth interviews lasted approximately 40 minutes, and the focus groups lasted an hour. The interviewer allowed sufficient and proper time with study participants and all interviews were audio-recorded and notes were taken during an interview for cross-checking and to capture observations of physical and emotional gestures as needed. The investigator summarised the content of the interviews before participants left and copies of the transcribed interviews were returned to participants or verbally explained to enable them to comment or make any corrections.

After the interviews were conducted, the notes as well as recorded audio were transcribed verbatim. All transcriptions have details of time, location and specific comments attached. The transcribed initial data was translated from Tigrinya into English. The translated transcript was read independently by the investigators, and each

investigator came up with their code, categorise and possible themes using Atlas.ti Version 9.

In the final stage, the investigators reviewed the analysis collectively and adjustments were made based on the discussion among the researchers. This resulted in the identification of seven major themes that emerged from the interviews.

Ethical consideration

The study was conducted after receiving permission from the ethical review committee of Mekelle University College of Health Sciences. The purpose and importance of the study was clarified to the participants. At the start and end of the interview participants were invited to sign the informed consent to permit the information be used in the study. All participants were assured that a code would be used to indicate confidentiality.

Background

A siege is defined by Merriam-Webster as "a military blockade of a city or fortified place to compel it to surrender" (Merriam-Webster, 2023). Similarly, the Oxford Dictionary defines a siege as "a military operation in which an army attempts to capture a town by surrounding it and cutting off the supply of food, etc." (Merriam-Webster, 2023; Oxford Advanced American Dictionary, 2023). Is it imaginable that the encirclement extends across an entire region, displacing one million individuals out of a population of more than seven million?

The two-year siege in Tigray caused a total communication blackout and free movements in the region was no longer permitted (UN News 2020; Omna Tigray, 2021). The challenges started before the outbreak of open war. Ethnic Tigrayan people were facing deportations to Tigray from various regions of Ethiopia, mainly from Amhara and Oromia (Gebreslassie & Van Reisen, 2024). Transport from the central part of Ethiopia to Tigray via Amhara was closed long before the war, and another route connecting to Afar was also closed at times. The intentional cutting of a transportation route to impose a

challenge to the Tigray region existed long before the war began (Jeffrey, 2019).

The election of the regional government held on the 9 September 2020 (BBC, 2021) caused serious friction between the regional government and the federal government, which led the federal parliament to vote to sever ties with Tigray's newly elected government on 7 October 2020 (Al Jazeera, 2020).

In the subsequent period, the siege began as the withholding of funding and a range service by the federal government to the Tigray region.

> *The Federal government diverted the region's budget, instructing the Ministry of Finance to disburse funds to lower-level administrative districts bypassing the executive bodies. The federal government also withheld funding for the safety net programme, a cash subsidy programme for the poor funded by western donors. During a locust invasion, federal officials halted operation of chemical spraying aircraft and blocked the import of a chemical spraying drone donated by the Tigrayan diaspora and neglecting Tigray when distributing Covid-19 protective equipment and masks, even to healthcare workers and vulnerable sections of the society. Even the federal sports commission circulated a memo instructing national leagues to sever ties with the Tigray region. The Ethiopian Postal service ordered its employees not to accept couriers destined to Tigray. The Federal public notary on its part rejected legalizing documents originated from Tigray on the ground that the government in Tigray was illegal.* (Tigray Government Talking Points, 6 June 2021)

After the Ethiopian federal government launched a military operation, referred to as a 'law enforcement operation', in November 2020, communication within the Tigray region became difficult (Melicherová *et al.*, 2024). A communication blockade and siege were put in place, impacting the entire population. Transportation to and from Tigray was strictly prohibited. People were denied access to their money deposited in the bank as private and government-owned banks stopped functioning in Tigray. Salaries and assets of civil servants, health workers, teachers, and university personnel were frozen.

Although there was some limited access to landline and mobile phone services in the initial period after the federal government entered

Mekelle, to demonstrate that the military operation was completed and that services were resumed, the lines were not fully repaired due to the ongoing military operations. After the federal government was ousted from most parts of Tigray in June 2021, communication was no longer available at all, and Tigray was completely shut down (Davies, 2021). In addition, government forces destroyed the UNICEF Mekelle branch office VSAT satellite infrastructure while leaving Mekelle following their defeat by Tigray forces (AFP, 2021; BBC, 2013).

The sharp growth in market good value and shortage of commodities reached an alarming level. This intensified the terrible repercussions of war and siege, such as starvation and malnutrition (De Waal, 2021). As a result, a critical number of children died of starvation (Akinwotu, 2021). The trickle-down impact of the communication shutdown and siege made it impossible for citizens to meet their everyday needs while also coping with market inflation (Gebremichael, 2022).

Communication was also hampered by permits being denied to journalists. Journalists who continued to report on the war, were harassed, intimidated, and denied visas. Ethiopia now ranks with Eritrea on the unfavourable highest place for detaining journalists in sub-Saharan Africa; a report from the Committee to Protect journalists says at least 63 journalists and media personnel have been arrested in Ethiopia since the Tigray conflict broke out in November 2020 (Harter, 2022).

Aside from instant communication control, there was also communication device control. International reporters were not permitted to enter the conflict zones. Any humanitarian worker permitted to visit Tigray was not allowed to carry any communication equipment (Dahir & Walsh, 2021; Zelalem, 2022).

The impact of the comprehensive siege was felt by everyone, including non-governmental organisations (NGOs) and humanitarian aid organisations. As stated in various NGO statements, the lack of access to transportation, communication, and financial services was said to have harm on the community by impeding the work of those agencies in distributing food and non-food items, as well as medical

supplies, resulting in increased morbidity and mortality (OCHA, 2021).

The siege in Tigray included the encirclement of Tigray and a communication blackout, including control over ICT infrastructure. This created inequitable information access to digital media or objects that harm pluralism and suppress dissent (Gebreananye *et al.*, 2022; Scott, 2021).

Before the Tigray war, there were around 12 Internet shutdowns to control elections, public uprisings and national avoidance of cheating in exams (Access Now, 2020). In those instances, the impact of the information blackout was limited to only detaching telecom and broadband connectivity. Hence, the black-out was limited to temporary disruption on ICT communication channels, leaving other private and government services intact and running smoothly without service disruption.

Figure 3.3. Phases of the Tigray siege

EEPA Situation Reports on Tigray

The Belgian based non-governmental organisation, EEPA, published almost daily on the war in Tigray. EEPA states that it is a Belgium-based Centre of Expertise with "in-depth knowledge, publications, and networks". It specialises "in issues of peacebuilding, refugee protection, and resilience in the Horn of Africa" (EEPA, 2020).

In this section, the attempt to circumvent the communication blackout is described and in the following section, the reports on the communication blackout and siege are analysed.

Circumvention of the communication blackout

The communication blackout during a time when wide-spread atrocities were committed motivated EEPA to produce the daily

EEPA Situation Report on the Horn of Africa, so that the scale of the problem would be appreciated:

> *The scale and brutality of crimes of Conflict-Related Sexual Violence against Women committed in Tigray have drawn widespread condemnation from around the world. While Tigray has been entirely closed off from communications for three months, and large parts remain closed off, large numbers of sexual violence have been reported.* (EEPA, 2021, SR 156)

From later documentation, it can be analysed that EEPA decided to produce the Situation Reports providing a window for communication during the blackout and the siege:

> *Truth is an indispensable element of any pathway to justice and peace. The search for truth in Tigray was hampered by a complete communication shutdown in the first three months of the conflict. This created a situation of impunity against atrocious crimes.* (EEPA, 2020)

There were different means through which EEPA was able to collect information, making use of a fine-mazed network of arteries that allowed it to receive information and assess reliability. EEPA prioritised information of what it considered reliable witness reports. Reflecting on the quality of the information it published, the organisation stated:

> *EEPA considers what civilian people in Tigray have testified when they were able to do so and have rigorously verified the testimonies. What we presented early in the Situation Reports has been systematically denied by the perpetrators, but as time went by, each of those stories appeared to be true.* (EEPA, 2020)

The EEPA Situation Report was the first to report the Aksum massacre, and the first to report the attack on the oldest mosque in Africa, located in Tigray. The EEPA Situation Report prioritised the reporting of what it considered credible eyewitness testimonies since the victims had no other means of being heard outside Tigray due to the communication blockade and siege. EEPA Situation Report also identified the presence of Eritrean troops – in its first report on 17 November 2020, which was vehemently denied by the Ethiopian and Eritrean regimes, but later confirmed (EEPA, 2020, SR 1). The events or situations – such as the atrocity in Aksum, the invasion by Eritrean troops and the attack on the Al Nejashi Mosque, at first denied, have

been investigated by independent international organisations who confirmed these events took place (EEPA, 2021, SR 55).

In the actual moment of the reporting, the communication blackout and siege hampered the possibility of EEPA, and of any publisher on the situation, to verify it. To qualify for the selection, it made to publish, the organisation clarified that:

> *While EEPA is confident of the sources and the checks implemented to verify the information, independent investigations remain necessary to establish the veracity of all the information and testimonies.* (EEPA, 2021, SR 55)

In a series of webinars held in 2021, EEPA clarified its objective and way of working, and how it ensured persons that provided information were not put in danger (EEPA, 2021, SR 45).

The EEPA Situation Reports covered the situation in Tigray in an almost near-daily rhythm during the communication blackout and siege and can therefore be considered an important source of information. The delay in reporting on important events, such as the Aksum massacre, underscores the point that the communication blockade and siege were effective in ensuring that the atrocities were kept under wraps. It took the EEPA Situation Reports a few weeks to begin to report on the Aksum massacre, and the lack of communication lines had a chilling effect on the communication of the atrocities being committed.

Tigray in darkness

The major events related to the siege and communication blackout are analysed based on the coverage of it in the EEPA Situation Reports.

On 17 November 2020, just two weeks after the war started, EEPA began reporting on the Tigray war. In its first report it stated that the Tekeze hydroelectric power facility had been damaged and that there was a communication blackout with only limited satellite communication possibilities (EEPA, 2021, SR 176).

People were unaware of the depth of the war's escalation after it erupted unexpectedly. An American witness who was in Aksum during the massacre described the situation to EEPA as follows:

> *A source reports a meeting with a doctor from Aksum who stated that on the day of the Aksum massacre he listed 300 bodies. The reflection is that even more than 750 people might have been killed. The community had understood that the Eritrean soldiers were intending to remove the Ark of the Covenant and the community came to protect it, including women and young people. The source states: "This was a massacre.* (Report collected from Aksum on 31 January 2021, cited in EEPA, 2021, SR 82)

> *The communication blockade and siege were experienced already before the war, but only reported three months later for the first time in the EEPA Situation Report: In Aksum water and electricity went out on 2nd November, before the start of hostilities on 3rd and 4th November. As a result, people in Aksum did not see any news. A few days later people arrived from Humera. They said that they came because of the war, that their houses were destroyed, and people had been killed.* (Report collected from Aksum on 31 January 2021, cited in EEPA, 2021, SR 82)

The whole of Tigray was cut off from the rest of the world. Immediately after the declaration of the law enforcement operation by the Federal Ethiopian government on 4 November 2020, connectivity was limited, and it was difficult to reach anyone in Tigray by phone, e-mail, or other communication means. Following the federal government's capture of Mekelle and the majority part of Tigray on 28 November 2022, the communication blockade was near-complete. There was only limited VSAT connectivity via international organisations and telecom service resumptions in Mekelle and its surroundings by Ethio-telecom. In June 2021, after an offensive by the Tigray Defence Forces (TDF) and the defeat of the federal Ethiopian military in much of Tigray, including Mekelle, Tigray was completely cut off from any communication and infrastructure set up by the central government. While leaving Tigray, troops of the Ethiopian National Defence Force (ENDF) stormed the UNICEF branch office in Mekelle. The military demolished and damaged the telecommunications infrastructure that served practically as the

backbone for all Tigray's non-governmental organisations (EEPA, 2021, SR 176).

EEPA received reports of a total blackout from sources in Tigray:

> *Tigray is still entirely locked off from the world in terms of communication; there is no phone connection and no internet connection, apart from some services by international organizations.* (EEPA, 2021, SR 191)

The loss of connectivity meant that there was no contact possible with the outside world and that it was not possible to communicate what was happening in the region:

> *'In the Tigray Region, millions lacked reliable electricity, telecommunications networks, and banking services, while commercial supply chains were severely disrupted.* (EEPA, 2022, SR 208)

Due to the overwhelming demand and the difficulty communicating with the outside world via the Red Cross and UNHCR hotlines, people were seen heading to the borders of Afar and Amhara in search of telecom signals (EEPA, 2022, SR 299). People travelled from across Tigray to border towns to connect and seek money from family and friends in other parts of Ethiopia and beyond.

In several parts of Tigray's Western, North Western and Central zones the Eritrean military was setting up and expanding the Eritrean network and dial code. Residents in these areas were paying the Eritrean military to call relatives outside Tigray. Those with relatives abroad are then detained for ransom (EEPA, 2021, SR 45).

Following the agreement on a humanitarian truce, which was reached by the end of March 2022, the Ethiopian government agreed to allow aid into besieged Tigray (EEPA, 2022, SR 265). However, the Ethiopian government exacerbated the situation by allowing only a few foods and medicines in and keeping fuel and cash in short supply. European Union Foreign Affairs Chief Borrell commented:

> *A cease-fire doesn't mean cutting a region off power or destroying critical infrastructure. Instead, it is about doing everything possible to help those vulnerable and in need.* (EEPA, 2021, SR 180)

Following the Pretoria Cessation of Hostilities Agreement on 2 November 2022 (Africa Union, 2022), services such as electricity, telecommunications, banking, and air travel began to be reinstated gradually in the parts controlled by the interim regional state government of Tigray.

Lived experience in an information black hole

Seven themes emerged from the interviews and discussions with the participants, which could be organised in a negative feedback loop of feelings associated with disbelief and a positive feedback loop associated with adjustment to the situation.

Disbelief

The study participants expressed they were horrified and perplexed by the war. Participants, particularly those near the border, said they were in a state of denial and unsure of what to do. Nobody considered leaving their homes, and they were hoping that Tigray forces would manage the crisis caused by the invasion.

When Tigray forces withdrew from the frontlines of the Western Zone, particularly Dansha, Welkaiyt, and Kafta Humera, people were made to seek safety and flee to Sudan and other areas within Tigray.

Because of the communication blackout, participants said they were uninformed of how the war progressed. The news that Tigray soldiers had withdrawn from important bases at the beginning of the war in 2020 was not taken seriously.

The primary source of information concerning the retreat of the Tigray army in 2020 was only conveyed through personal communication chains. There was no official channel to report this situation and therefore it was difficult to orientate what the status was in the region. As a result of the confusion, there was considerable denial and disbelief concerning the rapid change in events.

Because of the lack of information, and the uncertainty surrounding the information, it was difficult to know the veracity of any type of information. It was difficult to ascertain the veracity of big incidents

that were reported, such as the mass killings and massacres that happened in different towns of Tigray.

Because of the Communication black out, negative feelings of darkness, helplessness, dependency, and loss of trust in the system were reported. These feelings characterise the disbelief of the situation reported in this study.

Darkness

As part of the invasion, telecommunications, banking, electricity, and all lines of transportation were closed and shut down. Tigray was in the dark. As a result, the lives of the people of Tigray were deeply affected. Almost all the participants in this study left their homes and they were internally displaced. They travelled on foot with no money for transportation and other necessities:

> *The whole situation was peculiar for me! … well, I used to have an experience with phone and Internet services. But suddenly these were all gone.* (Interviewee 301, interview by T. G. Gebreslassie, face-to-face, June 2022)

A male, 38 years of age, who was married, a father of two and who teaches in a high school in Mekelle, explained that the news of the death of his father reached him only after three months:

> *I was not able to visit my family members who have been in Nebelet [Central Zone] for almost two years due to security, transport and financial reasons caused by the siege. The death of my beloved father, after a long illness, came from Nebelet in a piece of paper. Mind you! Living 200 km apart and not hearing about the death of your beloved father for three months. I haven't got the chance to even participate in his funeral and share the pain with my siblings and the whole family. It is hard to bear it!* (Interviewees 101, focus group interview by Liya Mamo, face-to-face, July 2022)

The darkness ripped the cultural moral and social fabric of Tigray apart. It was not uncommon to wait weeks or even months before learning of the death of a close family member.

Things got significantly worse after the Allied forces took over most of Tigray. Displaced individuals traveling from remote districts of Tigray to places such as Shire, Aksum, Adigrat, and Mekelle were unaware that the allied forces had invaded these cities and controlled

them. A then-pregnant teacher from Korarit remembers the situation as follows:

> *Because my hometown is in the middle of nowhere, we had no idea what was going on, when the entire communication system went down. We were unable to contact anyone and request information. Because the enemy arrived in our town so early, many of us fled the day they arrived. We were told when we passed the Tekeze River that the enemy had returned the next day, but this was merely a rumor. The truth was that the opponents had complete control of the town, and many people were trapped and had not been able to leave. I've witnessed horrific awful incidents. Soldiers have taken numerous women from the arms of their brothers and spouses. So, because of the communication blackout and our inability to obtain information, we lost lives, and the enemies had entered Shire before we arrived. We arrived in Shire after a 15-day journey.* (Interviewees 106, focus group interview by Liya Mamo, face-to-face, July 2022)

A male midwife who had worked at Badme Health Centre in the North Western Zone; had returned to his hometown in the Central Zone called Mahbere Dego and was in a hidden maternal and delivery facility in his village when the Eritrean and Ethiopian troops took control. He described the gun violence and mass shootings as follows:

> *The murder, gang rape, looting, and vandalism all took place in broad daylight. Nobody could put a stop to it. Unfortunately, the testimony of the Tigrayan diaspora was dismissed as anecdotal, and all our claims fell on deaf ears. It was unbelievable this could happen in the twenty-first century.* (Interviewee 201, interview by T. G. Gebreslassie, face-to-face, June 2022)

In Mahbere Dego an extrajudicial assassination was alleged to be committed by the ENDF and dozens of civilian Tigrayans were killed in a single day. This is one example of what happened in a widespread and systematic way throughout Tigray. The atrocities were committed in daylight and openly, as the military had no fear of these being communicated. The Mahbere Dego event is well-known, because a whistle blower was able to deliver a video made of the event and it reached the Tigray Media House. The Tigray Media House is a Tigray-affiliated TV station based in the US and it subsequently covered the assassination on its station. Subsequently this event received widespread attention in the international media.

Not all people fled at the same time. Some felt that the war only involved local and national governments and that it would be over as soon as the operation was completed. Their perception of the situation appeared incorrect, and they got caught up in atrocities. They were the victims of mass massacres, rape, and kidnapping. They were taken away in prisons, rounded up, and then dropped into the Tekeze River. The testimony of a survivor of a heinous act remembers the event as follows:

> *The Tigrayans who resided in May Kadra were all arrested in different places. My child and I were held captive in a camp called 'Haile Jebar'. The Fano group [an Amhara paramilitary group that was part of the allied forces invading Tigray] was persuaded by my younger sister, who was not identified as being Tigrayan, that we were innocent and should be excused from guilt. Yet again, we were then detained in 'En-da Abadi' and those who claimed their families had been murdered or somehow lost, flocked to seek for the murderers among us. We would be told to line up and take off our clothes in front of our kids and other males and they would laugh and occasionally point fingers at us since we appeared to be a suspect in the murder of an Amharan relative. [...] They seized our gold and cash. We were all suffering and in great pain since our children and everyone else had cholera. After some time, the Ethiopian army took us to Tekeze and instructed us to walk. We did nothing but walk and run for days...* (Interviewees 202, focus group discussion by Liya Mamo, face-to-face, July 2022)

With tears in his eyes during the interview, the midwife recalled situations like the assassination in Mahbere Dego, which he witnessed but was unable to report, due to the blockade and communication blackout. He expressed his disbelief of what he saw:

> *I've witnessed killings firsthand. The soldiers were cruel and even joyful... [sobbing]. How can humans be so callous as to kill someone and then order him not to be buried? I recall the murder of thirty innocent individuals from our village. This event was never broadcast or relayed to any organisation.* (Interviewee 201, interview by T. G. Gebreslassie, face-to-face, June 2022)

The inability to bury the dead became a very important issue. While on the one hand the invading forces stopped relatives or community members from burying the dead, causing great aggravation and pain,

the lack of communication lines also caused many to learn late of the death of family members.

Shock: Experiencing helplessness and dependency

Financial services highly depend on centrally managed communication infrastructure. Banks use a communication system to connect their branches. When the war broke out, the federal government cut off the services and froze all financial transactions. Users from Tigray could not access their money, and civil servants did not receive their salary for more than one year.

One of the respondents who had used the banking service his entire working life, explained the genesis and status of the financial siege.

> *The saving culture has been improving. ATM and mobile banking were the best options for transactions. Since the government was also discouraging the use of cash by limiting the maximum amount [50,000 birr] that an individual could withdraw each month, every transaction was online. Following the outbreak of the war, banks are left only with chairs and tables and don't even have a penny. Let alone a monthly salary; there is no way to withdraw what you deposited trusting the bank.* (Interviewee 101, interview by T. G. Gebreslassie, face-to-face, June 2022)

Due to the collapse of the banking system, people were taking alternative measures to get cash by transferring money from outside to others in Ethiopia, who would give half of the amount in cash. Similarly, if you had someone outside of Tigray who could deposit money in a financial agent's account, this could be (in part) transferred in a parallel cash transfer arrangement in Tigray. 'Hawala' is a money transfer service where someone outside Tigray pays money, and 50%, or often more, is cut and delivered in a parallel transfer to relatives in Tigray.

A participant who had such kind of experience explains:

> *'I was empty cash-wise and unable to access my money. The best solution I found was to manually transfer to someone who could give me cash for half of what I transferred. People who have friends and families abroad are also getting services via brokers. Families' overseas deposit in the dealer account, and the dealer gives half of*

it to designated ones.' (Interviewee 102, interview by Liya Mamo, face-to-face, June 2022)

All respondents stated that they relied on aid from NGOs or family and friends. Civil servants were compelled to work without pay. Participants explained their shock when faced with powerlessness and dependency. A female clinical nurse, who was once the family breadwinner, described how she suddenly was forced to beg for money from her poor farmer family for sanitary goods.

> *We are dependent on our families. There were one or two rounds of food aid from the international organisation. But the support is just a drop in the ocean. It is not only food that I, for example, demand as a person or a woman. I had to ask my family for a small amount of money to buy sanitary products, especially menstrual hygiene materials.* (Interviewee 301, interview by T. G. Gebreslassie, face-to-face, June 2022)

A health expert from Sheraro's Ziban Gedena Health Center likewise revealed his powerlessness in advising the community to follow conventional disease prevention measures that he could not follow:

> *We don't have basic cleaning materials as an institution or individual. I get ashamed when I try to educate my patients or the community on basic disease prevention issues while I am not able to do so. It's been a year; I wash my cloths only using water.* (Interviewee 401, interview by T. G. Gebreslassie, face-to-face, June 2022)

The participants who were teachers passed through a hard time, as they witnessed the suffering of every family through their students. One of the participants explained how he was helpless when seeing hungry kids in school:

> *Students and teachers are from and within the community, and I know the teachers are expected to look tough and are a role models, but they are starving, and in a deep problem. You see the kids hungry, and it makes you feel numb not being able to do anything about it. It makes you ask yourself: will it ever pass?* (Interviewees 203, focus group interview by Liya Mamo, face-to-face, July 2022)

Another teacher portrayed the level of the problem, talking about his health status and physical strength:

Look, I am a young man, as you can see, but these days I can't go through two class sessions without rest, and it is like if you sat down because you are tired you feel like you can't get up. We have witnessed teachers falling into exhaustion and hunger. This is because teachers are part of the community and are coming here without a bite of bread. (Interviewees 204, focus group interview by Liya Mamo, face-to-face, July 2022)

It was apparent from their faces and physical appearance that all the respondents had a story to tell about how they were shocked to find themselves in a situation of dependency and helplessness.

Loss of trust in the system

The infrastructure that facilitates communication and financial services is, in one way or another, government owned. The federal government centrally manages this infrastructure. When the war broke out, the government terminated these services immediately. A male health professional described the central government's intention and how it affected his livelihood:

Money, I deposited to use it in my hard times trusting the system and the government has now vanished. How can I call it a government when it is denying my money by cutting off the entire network? It is foolish to believe a government that even killed and raped us, will facilitate our money later in time. I am not sure our money is even available anymore. Nobody could give us a guarantee. What makes things worse is that we could not even get the money that our relatives sent us from overseas. (Interviewee 101, interview by T. G. Gebreslassie, face-to-face, June 2022)

All respondents cited the effect of the communication blockage in other systems apart from the financial system.

The federal government also deliberately cut off virtual private networks (VPN). HealthNet is a typical example. The health system was using the HealthNet for pipelined communication to send health data to and from health facilities. A female health professional discussed that:

Before the war, the health information system of our facility was excellent. We used to have a computer to register our patients at the medical record unit and another computer to capture the aggregated health data of our patients. Besides, we had

> *computers in different units and departments of our health centre. Currently, we don't even own a TV. All are looted and destroyed by the Eritrean forces. To your surprise, there was a HealthNet network we used to communicate with the district health office and regional health bureau. At this time, all the materials are either destroyed or looted.* (Interviewee 301, interview by T. G. Gebreslassie, face-to-face, June 2022)

Not only the government system but also the social function was also affected. A male teacher stated:

> *Our social function has been impaired. We are not able to communicate and gather on schedules. Many meetings were cancelled due to a lack of participants because they hadn't gotten the information. And we are now afraid of gathering and seeing friends hospitalised and just had a baby with the worry of what will we be taking and will we be going empty-handed.* (Interviewee 501, interview by T. G. Gebreslassie, face-to-face, June 2022)

The communication blockade and siege undermined the financial and public sector resulting in great disruption. It damaged the trust in the government and the social system.

Abandonment

After fleeing their homes and being separated from loved ones, IDPs were forced to seek refuge in temporary shelters or schools in Tigray's main towns. Initially, the host communities in these towns aided with food and other necessities. However, as time went on, the host community were no longer able to provide support and required aid as well, and no one felt able to provide special care to the IDPs. As a result, IDPs suffered.

A mother who was expecting her first child at the start of the war and at the time of interviewing had a two-year-old child, recalled every detail of the ordeal caused by the war. She testified to the unimaginable atrocities committed by the allied forces. She followed her testimony of the difficult situation she found herself in due to the lack of assistance. Local authorities and aid agencies were unable to provide help.

She testified that support was generally better in the eight months between the start of the war and the time that the TDF took over Mekelle, and the Tigray regional government returned:

> *After running away and traveling hundreds of kilometres on foot from Adebay to Shire, nothing awaited us. There was no organised hospitality or assistance. We felt abandoned. I've come to see how unfair the world is. Even those who we elected to govern us did not handle us well.* (Interviewees 204, focus group discussion by Liya Mamo, face-to-face, July 2022)

This sense of being forgotten persisted in the aftermath of the Pretoria Cessation of Hostilities Agreement. For Tigray to relaunch its educational system, IDPs were forced to leave their shelters in the schools without sufficient preparedness.

Loss of hope

Following the declaration of victory by the Ethiopian federal government and the takeover of Mekelle, many people fled from Tigray to Addis Ababa and other countries. The situation became worse when the regional authority retook Tigray, and a total siege and blackout was on full scale.

Initially, there was hope that the Ethiopian federal administration and the Tigray regional administration would resolve their differences. As the situation deteriorated and the siege and blackout persisted, people began to flee Tigray.

A young man from Mekelle justified the reason why youths opted to leave the region via risky routes.

> *'Ethiopia's political climate is fragile, and things frequently change dramatically. It seems dangerous to continue to live here, start a family, and grow. Why would I risk my life? To challenge and see myself in other parts of the world, would be a good idea.* (Interviewee 601, interview by T. G. Gebreslassie, face-to-face, June 2022)

Tigrayans started to dream of living in a place elsewhere as they experienced a loss of hope as the situation of the communication blockade and siege persisted.

Adjustment

Passing through adversity and realising the new reality, people of Tigray began to adjust their lives accordingly. There were innovative ideas brought to the table to lessen and ease the difficulties.

Persistence

Participants expressed their belief that, despite the hardships and obstacles, the situation would eventually pass and that a brighter day was awaiting. Civil servants were willing to help society at any cost, regardless of how unpleasant the problems were. According to one female teacher, the situation was as follows:

> *Despite the unfortunate difficulties, I am optimistic. I must carry my bag of hope for better days to come and that this is a struggle we must face to let the sunshine. I believe better day would come. I get the motivation from my students. Teaching and interacting or helping them in any way allows me to leave a fingerprint on the next generation.* (Interviewees 205, focus group discussion by Liya Mamo, face-to-face, July 2022)

A health practitioner added:

> *The only choice we have is to look brave for our patients and share their pains and struggles. Even with the lack of medical equipment, shortage of drugs in our facility, and the breaking of the health system, we are trying to give them comfort and support by making sure what they need is within their reach. We keep gluing every failure in the system with the sweat and energy of the health providers. But most of all, the positivity and glimpse of hope witnessed in the eyes of our clients are what keeps us lingering and going non-stop.* (Interviewee 301, interview by T. G. Gebreslassie, face-to-face, June 2022)

To be a teacher or health professional helped to overcome the negative feelings and to look for ways to contribute and help others:

> *…Our community is overwhelmed by various difficulties, and our role is needed more than ever. We have a sense of purpose in serving our community. We should step up to be role models and be courageous enough to commit to delivering. Even if it takes to write down 40–50 questions on the blackboard for mid-exam, teaching six sessions on an empty stomach, or having recurrent intruding thoughts of our family's whereabouts or worries.* (Interviewees 106, focus group discussion by Liya Mamo, face-to-face, July 2022)

The ability to be useful for others, helped the teachers and health workers in finding a sense of purpose and in developing a more positive mindset.

Dissent and creativity adaptation: Circumvention of the communication blockade.

The primary sources of social media were NGO workers. They not only updated their Facebook and Twitter feeds, but they also took screenshots to share with others who did not have an opportunity to connect with the rest of the world.

Daily screenshots were sold for 10 Ethiopian birr, and what was said and done in the social media stream throughout the day was spread via screenshots throughout the major cities. Through the screenshots shared by Bluetooth, people still had the most up-to-date information on the globe, including through the EEPA Situation Reports.

One participant eloquently explained how he was able to get information at that time by saying:

> *People were attempting to get acquainted by assisting one another. Despite the Internet and communication blockade, people were still utilising screenshots to share information, and movies and audio were being sold. It was fantastic that you could copy up to 2GB of data for only 10 Ethiopian birr. I believe that as a culture, such problem-solving abilities were among many of the characteristics we should improve and maintain.* (Interviewees 307, focus group discussion by Liya Mamo, face-to-face, July 2022)

Furthermore, those with an Internet connection might keep other people's phone numbers and compose messages offline in instant messaging apps like Messenger, Telegram, or WhatsApp, and then send a voice or text message operating as a middleman between the two ends.

There was also a local mail delivery service, where delivery personnel would pick up letters from one town and bring them to another for a fee of 50 Ethiopian birr.

The study also revealed that people were able to communicate and share information through the electronic transfer of social media screenshots from Facebook and Twitter as well as the EEPA

Situation Report via Bluetooth and the Xender mobile application. There was also a great need for learning, using offline mechanisms, while not depending on Internet connectivity. For example, a project called Digital Innovation Skills Hub (DISH) (https://dish-portal.kiu.ac.ug/) has tested an alternative eLearning system whereby Students come to specific places sync tailored courses and follow the course material at their own pace on any screen available.

Similarly, in digital health, the shortage of paper-based tally sheets for reporting, the shortage of registers and reporting formats under the siege, and the lack of access to the central government systems during the siege, resulted in the creation of new solutions. For instance, the central government's medical reporting system collapsed during the war. The new solutions were engineered based on the possibility of local existence of the data and local control over the use of the health data. This led to the first operational test of a distributed, federated health data reporting system (Amare *et al.*, 2023). The reliance on centrally controlled communication infrastructure was questioned since it lacked the resilience to cope with the strain of conflict, as was experienced in Tigray war.

After the Pretoria Cessation of Hostilities Agreement

At the time of drafting the article, schools are still home to people who have been displaced from various parts of Tigray (The New Humanitarian, 2023). One million displaced people are currently living in schools and IDP centres in different Tigray towns, including its capital, Mekelle. The IDPs still lack access to food and other essential items and services.

One of the cornerstones of the Pretoria Cessation of Hostilities Agreement was the establishment of an interim regional government in Tigray, which was expected to be followed by the withdrawal of outside forces. At the time of writing, Amhara and Eritrean forces continue to occupy Tigray's Western Zone, as well as some areas in the North Western, Central, and Eastern zones. This has exacerbated the issue, as the farming season approaches, and the displaced people remain in refugee camps (Berhe, 2023a). Communication with and access to these areas is generally still very difficult.

Besides the helplessness and dependency, participants lost trust in the systems that were used against them. While Tigray was shut off, there was a 5G network expansion in the other regions of Ethiopia (Endeshaw, 2022) Even after the Pretoria Cessation of Hostilities Agreement, there was no attempts to expand the 3G congested network in Tigray.

Similarly, land transportation of commodities from the central part of Ethiopia to Tigray has been hampered by the establishment of checkpoints in practically every city, as transporters are requested to pay extra money for passing permits.

Furthermore, Ethiopian Airlines, the only air transport firm that has been criticized for participating in the Tigray war by delivering artillery and troops, has been mistreating Tigrayan passengers. People traveling from Tigray to Addis Ababa were denied tickets based on their age and ethnic identity and those who were able to get tickets were asked for extensive details about their stay and went through luggage searches which were not common in other flights by the airport security (Berhe, 2023b; Tekeste, 2022).

With regards to telecommunications, the deployed telecom connection was a congested line, leading to people queuing outside the telecom office to get service. Later, communication services have started to improve significantly. In November 2023 EthioTelecom started 4G service in the capital Mekelle and Safaricom services entered the Tigray region (FBC, 2023; Fidel Post, 2023).

Discussion

The world has witnessed long blackouts in Pakistan, India, and Myanmar. However, in those cases the communication restrictions were selective and services such as banking were functional (Kamran, 2017; Hlaing, 2020; Maqbool, 2020; Access Now, 2022). The blackout in Tigray was comprehensive (Access Now, 2022). Tigray was isolated from the rest of the world and kept in darkness. People were not only cut from communication services such as mobile phone networks, landline networks, or the Internet but also from any national service that depended on the ICT infrastructure.

Like the accusation by the government of Syria that opposition groups were responsible for cutting off the Internet (Ackerman, 2014), the Ethiopian government blamed the Tigray forces for the shutdown of the communication infrastructure. The communication blackout and the absolute blockade forced inhabitants of Tigray to live in the dark for two years, feeling deprived and helpless.

The blockade created a communication blackout whereby those who could get limited access benefitted from it. Individuals with Internet access were doing business by delivering information and facilitating money transfers. These brokers were in favour of the information gatekeepers who demanded half of what was being transferred. This activity corroborated with the activities of the network gatekeepers for human trafficking in Eritrea (Van Reisen *et al.*, 2019; Van Reisen *et al.*, 2020; Van Reisen *et al.*, 2023).

In contemporary history, numerous sieges have been portrayed. The siege of Tigray is comparable to these sieges, yet distinct from them. As it was a result of war, there are certain similarities. However, the siege had its distinctiveness when we consider its scope, goals, and participants. The siege in Tigray was not only an enemy's attempt to enclose its rival and seize control of it; it was also a comprehensively planned line of action that encompassed communication blockade, suspension of essential services, and humanitarian efforts.

The siege of Sarajevo, the capital Bosnia Herzegovina during the Bosnian war, lasted longer than the siege of Tigray. Nevertheless, compared to the Tigray region, which is estimated to have a population of over seven million, Sarajevo was a much smaller city with a modest population. The siege in Sarajevo took place before the Internet, and all media outlets in Sarajevo were covering the event and establishing a communication infrastructure, placing Sarajevo in the spotlight (Morrison, 2021). However, during the Tigray siege in this digital age, individuals were methodically shut off from all forms of communication, including the Internet, and placed in an information black hole. The lack of attention and focus made Tigrayans feel helpless. Besieged Ukrainians were able to obtain Internet access from Starlink after the Russians infiltrated their Telecom network (Wadhwa & Salkever, 2022).

Teachers and healthcare workers have been working in situations with limited resources, without benefits or salary, simply because they believe their presence matters in stimulating hope in the people of Tigray. The mentality of those who lived in besieged Leningrad, or modern-day Saint Petersburg, during World War II is like the reaction of the people of Tigray. There, emaciated instructors even passed away in their classrooms while imparting knowledge and hope to their students (Semenov, 2019).

Conclusion

There were five distinct phases to the Tigray siege and communication blackout. The initial phase encompassed the period before the war. The second is the period from the start of the war until the federal government took control of Mekelle on 28 November 2020 and declared victory. The interim administration appointed by the federal government, lasting eight months until June 2021, took place within the third phase. The fourth phase spanned from June 2021 to November 2022, encompassing the time after the federal administration was expelled from much of Tigray, including Mekelle, until the Pretoria Cessation of Hostilities Agreement. The fifth phase was the period after the Pretoria Cessation of Hostilities Agreement. The siege lasted two years, from November 2020 until the signing of the Pretoria Agreement in November 2022. During these five phases, the control of communication and the extent of the siege differed.

This chapter assesses the distinctive features of the siege and communication blackout in Tigray, while focusing closely on the personal lived experiences of teachers and healthcare workers. This research employed the concepts of 'information black holes', social identity theory and the theory of critical transition to interpret and explain the lived experiences of people in the communication blackout and siege in Tigray during the 2020–2022 war. The goal of the study was to explore the lived experiences, and it is not a comprehensive study. The participants were selected from teachers and healthcare providers because they were on active duty. The

participants, except for a small number, were all internally displaced people housed in IDP centres.

The analysis shows that the control over information was profound. For instance, the Aksum massacre took place over three phases in the period from 19 November 2023 when Eritrean military entered Aksum and looted the city and the massacre which took place on 28–29 November (Tesfa *et al.*, 2024), which was reported for the first time on 31 January in the EEPA Situation Report, the first outlet to report it. All that time, the presence of Eritrean troops in Tigray was denied by the Ethiopian and Eritrean governments. The black hole created in Tigray provided a strong advantage to the invading forces to control information about the situation.

As the population was undergoing extremely difficult circumstances of war, without an outlet through which to communicate and ask for help, their lived experiences exacted a severe mental toll. Looking at disbelief, adjustment, and dissent as response mechanisms, recorded in earlier studies on the impact of siege, the following sub-themes emerged in this study from the interviews:

Disbelief, associated with feelings of:

- darkness
- helplessness and dependency
- loss of trust in the system
- abandonment
- loss of hope

Adjustment:

- persistence

Dissent and creative adaptation:

- circumvention of the communication blockade

This study shows the relevance of the constructs of the mental state of people living under siege, as previously studied by other scholars in Sarajevo. During the state of disbelief, this study found confusion and bewilderment; during the adjustment period, people were adapting to rapidly and frequently changing actions that produced new norms with economic and political shifts. During the state of

dissent, people were facing reality and putting trust and truth to the test, with persistence and creativity. In Tigray, plentiful examples of creative innovation and seeking solutions within the new circumstance are registered.

The constructs of mental state during the siege were triangulated with the components of the social identity theory of social categorisation, social identification, and social comparison to create a framework that explores how the communication blockade and siege during the Tigray war impacted Tigrayans as a group entity.

Living in a communication blockade aggravated people's experience of the siege. As a result, the social identity of Tigrayans was altered. The people of Tigray were pushed to the verge of irreversibility by these pivotal moments, which made them interpret the war and its aftermath in a 'we and them' categorisation and gave rise to the perception of an in-group (Tigrayans) and out-group (the invading forces) phenomena. The siege resulted in a social categorisation by Tigrayan people as an identity apart from others and different from others, including from other Ethiopian people.

The experiences of the people of Tigray during the war encapsulate such rapid and transformative societal changes, leading to a reconfiguration of social dynamics, power structures, and collective beliefs within the region. Because of the communication blockade and the siege, an awareness has deepened in Tigray, that it must be able to always rely on its resources.

The study found that the communication blockade raised concerns over the digital divide and its consequences for the future. The disbelief of what happened was compounded by the sense of total lack of control over communications. It was, therefore, difficult if not impossible, to ask for help and to communicate the ordeal with relatives, or anyone else. The research found that participants realised the weakness of centrally implemented and controlled information systems and demanded a federated infrastructure. Creative engineering emerged in Mekelle, through which such systems are tested. This has the potential of revolutionising the use of federated

infrastructure, to lessen dependency on central government communication infrastructure.

How people can creatively come up with digital solutions in the event of a digital black hole is also illustrated in the Tigray communication blockade and siege. The digital system – even if offline – remained a source of communication, but adapted to a situation that was dependent on intranet features, and making use of people (who were able to 'gatekeep'), who could provide information from the outside world on the situation inside Tigray[1]. This also led to innovation. New creative forms of using digital devices for health and education data sharing were engineered and tested. These can form a new generation of federated digital engineering that is not externally controlled.

[1] The situation reports collected information that, because of the communication blackout, people in Tigray did not have and therefore was used by people in Tigray to understand and disseminate information on the situation in Tigray. This information was disseminated by Bluetooth and word-of-mouth because there was no internet. It was also sold in bundles in street markets.

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Authors' contributions

T. G. Gebreslassie and Gebru Kidanu are both first authors of this article. This work has been carried out as part of the PhD studies of both of them. The first author oversaw the design and implementation of the study. The second first author designed the framework and connected it to the analysis and results. The third and fourth authors coordinated data collection and analysis. The fifth author has reviewed all versions of the articles and advised the researchers on their approach and on the theoretical framework.

Ethical clearance

This research was carried out under ethical clearance obtained from Mekelle University, reference number MU_IRB 1978/2022. Tilburg University has also provided ethical clearance. This research was also carried out under ethical clearance obtained from Tilburg University Identification code: REDC # 2O2On13 on "Social Dynamics of Digital Innovation in remote non-Western Communities".

This chapter should be read in conjunction with the 'Note on Content and Editorial Decisions'.

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