

The climate missing: identifying bodies and preventing disappearances linked to climate change

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INTRODUCTION

The absence of a missing person has significant negative consequences for the health of families. The kin of individuals who disappear in the context of forced separations reliably report depression, anxiety, post-traumatic stress, somatisation and a special, incomplete form of grief termed ‘ambiguous loss’.^{1,2}

Neither scholars nor law enforcement officials offer a consensus definition of the term ‘missing’.³ In this article, we define ‘missing’ as a label, one denoting a variety of deviant absences.⁴ A person can be formally labelled as missing by the state or informally labelled by members of their intimate network. The term ‘missingness’, in turn, refers to the social process whereby missing persons are both constructed and reacted to, including by institutions tasked with their location.⁴ As a population, the missing overlap with that of the unidentified dead. As one group of forensic scientists phrased it, the former consists of ‘identities without bodies’, the latter of ‘bodies without identity’.⁵

It is now well-documented that anthropogenic climate change harms human health through a wide variety of pathways, resulting in shifting patterns of global illness, injury and death.⁶ Yet, scholars and policymakers have so far ignored the potential for climate change to increase the number of missing persons through the creation and intensification of processes that reliably create disappearance.

This essay identifies three main processual links through which climate change produces missing persons: natural disasters; migration and forced mobility; and social and political conflict. Put together, we argue that the ‘climate missing’ is emerging as an unignorable side effect of shifting climatic conditions, one that urgently necessitates research to identify these absences and funds for mitigation. Further, these three processes are socially patterned, and it is typically

SUMMARY BOX

- ⇒ It is known that the absence of a missing person has significant negative consequences for the health of families. The kin of individuals who disappear in the context of forced separations reliably report depression, anxiety, post-traumatic stress, somatisation and a special, incomplete form of grief termed ‘ambiguous loss’. It is also well-documented that anthropogenic climate change harms human health through a wide variety of pathways, resulting in shifting patterns of global illness, injury and death.
- ⇒ Scholars and policymakers have so far ignored the potential for climate change to increase the number of missing persons through the creation and intensification of processes that reliably create disappearance. This essay identifies three main processual links through which climate change produces missing persons: natural disasters; migration and forced mobility; and social and political conflict.
- ⇒ Researchers can begin addressing this problem by gathering better data about these absences—to better understand who becomes missing and under what circumstances—as a first step towards developing a more sophisticated response to the problem. As for policy proposals, wealthy states could finance initiatives in less well-resourced countries that accomplish two goals: preventing disappearances before they happen and resolving the fate of those who become missing.

marginalised groups—economically, ethnically or otherwise—that bear the brunt of disappearance more than well-resourced individuals and families.

In particular, climate change has raised the number and intensity of a variety of extreme weather events that engender disappearance. In August 2023, hundreds were listed as missing in the aftermath of wildfires on the island of Maui.⁷ In March of the same year, over 500 missing Malawians were presumed dead after being buried in a series of mudslides unleashed by the exceptionally long-lived and intense Cyclone Freddy.⁸ Up to 1200 Bahamians are still unaccounted



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for after 2019's devastating Hurricane Dorian.⁹ These extreme weather events can also produce new missing persons indirectly, through the secondary mechanisms of migration and conflict, which are themselves subject to climate-change-related intensifications. While climate is never the only factor in creating disappearances, it is undeniably part of a complex web of explanations for new movements of people across borders and social and political conflict.

In Western countries, after an accident or disaster, it is standard to collect medical and biological data from remains to allow for identification and return of a corpse to surviving kin. But in many contexts in which the marginalised die, this does not happen. Global South countries produce, proportionally, more than double the number of unidentified bodies as developed nations.¹⁰ Between 2003 and 2013, for example, over 20 000 migrants drowned while crossing the Mediterranean, an estimated 60% of whom were unidentified due to difficulties in recovering data from the bodies.¹¹ This represents both a lack of political will and funding on the part of high-income countries, as well as a lack of resources or capacities on the part of countries of origin to organise coordinated searches or invest in preventive infrastructure. Many migrant bodies within Interpol's Disaster Victim Identification database, for example, cannot be identified through biometrics, including fingerprints, DNA and dental records due to the poverty of their countries of origin.¹²

We therefore argue, too, that the nations which have historically put the most planet-warming carbon dioxide into the atmosphere have a duty to help families with missing loved ones in poorer, less carbon-emitting countries. In a wealthy country like the USA, victims of disaster tend to be quickly tallied and searched for. But less-wealthy nations, which are more vulnerable to climate impacts while bearing less historical responsibility for carbon pollution, often do not have the resources to follow through. Rich countries should fund measures for these nations that both prevent disappearances through financing resilience and adaptation initiatives and also help resolve outstanding missing persons cases by

promptly identifying bodies and publicising information about those who disappeared.

LINKS BETWEEN CLIMATE CHANGE AND MISSING PERSONS

Three types of climate change-related processes and events reliably produce disappearances, which we present here, along with empirically documented examples: so-called natural disasters, migration or forced mobility, and social and political conflict. Climate change is likely associated with other mechanisms linked to missingness, but we propose these three as an initial exploration into the phenomenon and to most clearly illustrate the connections (table 1). As we will explain below, a lack of data and theory on this problem precludes sophisticated modelling on the precise role climate change plays in the creation of missing persons.

First, climate change has increased the intensity and frequency of a number of extreme weather events.¹³ Like an increasing number of tropical storms, Hurricane Dorian and Cyclone Freddy were likely each rendered more powerful and long-lasting by our warming planet.¹⁴ These climatic events can themselves produce disappearances, as individuals are killed in such a way that their corpses are unrecoverable or unidentifiable. In September 2023, dams in Libya, swollen by flood water, gave way, producing thousands of missing persons.¹⁵ In this case, the effects of climate change, which had rendered the Libyan soil harder and less vegetative, making it less able to absorb floodwater, interacted tragically with a political economy wherein decades of government neglect had left the dams weakened.

One crucial contribution from social scientists, particularly sociologists, to the understanding of disasters and natural hazards has been to argue that there is no such thing as a 'natural' disaster.^{16 17} Although we are all affected by extreme weather in one way or another, it is a number of social, not natural, fault lines that strongly determine who is most affected and how—who lives, who dies and who becomes missing. These outcomes are shaped by, among other things, class, race, age, the strength of social networks and community resources.¹⁸

Table 1 Examples of potential links between climate-related events and processes, and the production of missing persons (illustrative and non-exhaustive list)

	Disasters	Migration	Political conflict
Mechanisms producing missing persons	Swept away during storms; Charred during fires; Buried under collapsed structures	Accidents during land or sea travel; Violence along the trip	Kidnappings; killings
Processual link to climate change	Extreme weather events, for example, storm surges and wildfires, are made more severe by human-induced climate change	Climate change impacts, for example, drought or long-term sea level rise, may lead people to leave their communities to settle elsewhere	Changing climatic conditions, for example, drought and associated agricultural impacts, may contribute to social instability and political unrest
Potential examples	Lahaina, Hawaii; Cyclone Freddy; Hurricane Dorian	Coastal Bangladesh; Drought in Latin America	Syrian civil war; Nigeria

In sum, the well-off are largely insulated, while the already marginalised suffer. Like those most impacted by other effects of climate change, climate disappearances appear disproportionately drawn from those who are least ready to face the impacts of a warming planet. One difficulty with tracking the climate missing is that the people who are most likely to become missing are often those who put bluntly, societies are least likely to miss.

Second, besides disasters, climate change is linked with more chronic and slow-onset negative impacts, such as drought or salinity intrusion,¹⁹ which in turn can cause disappearances through more indirect routes, such as migration or forced mobility. Existing literature on climate change and migration, or mobilities, carefully considers the potential relationships between new environmental conditions and the movements of people.²⁰ Malnutrition and famine linked to new climate conditions, for example, have pushed more Africans and Latin Americans to undertake the perilous journey across the Mediterranean and over the Mexican border, where tens of thousands have disappeared.^{21 22} Climate change at times creates conditions that make it difficult for individuals and families to remain in place. Increased temperatures, wildfires or flooding can indeed make a place more uninhabitable and push people to move or migrate away. Along the journey, people can face perilous circumstances and sometimes become missing.

Moreover, climate change can impact migration in indirect ways, such as putting stress on livelihoods, often for agricultural workers, meaning that families are no longer able to make a living in their home communities due to changing climatic conditions. When poor families are pushed to move, they sometimes run into danger, which may cause them to become missing. Rising temperatures themselves have also served to make these passages more lethal, as migrants die of heat exhaustion while trekking across arid deserts and asphyxiate inside metal shipping containers.^{23 24} As sea level rise projections indicate that more people will retreat and settle away from coastal areas, we can expect new patterns of mobility and thus more missing persons along the way.²⁵

Third, war and political conflict are other factors that can contribute to missingness through more distant routes. Such conflict frequently produces unresolved disappearances, either through state repression or through unidentified dead. A growing body of scholarship has begun to explore the role climate change plays in starting or prolonging conflict.²⁶ Some scholars argue, for example, that a drought, exacerbated by warming, was a factor in the onset of the Syrian civil war, which has so far produced an estimated 130 000 missing persons.²⁷ Though a recent review of the links between climate change and conflict concludes that there is no strong, incontrovertible evidence of a direct link between temperature and intergroup conflict, a wealth of empirical studies documents a startling pattern.²⁸ Temperature increases have had a positive effect on civil war incidence in sub-Saharan Africa, for example, and

rising temperatures could continue increasing incidence in the future²⁹; wetter years tend to increase the incidence of civil conflict, especially in developing nations (wet periods were associated with increased communal violence in East Africa)³⁰ and water scarcity increases the risk of conflict between countries when those countries share a river in between them.³¹ Even those who have argued against climate change as a pertinent factor in the Syrian conflict do not dismiss the overall link between climate change and conflict.³² So long as climate helps produce or intensify conflicts, we expect new absences to follow.

Often, the factors linking climate change to missing persons can overlap (for the case of Nigeria, see Hamadeh *et al*³³). In Nigeria, floods worsened by climate change have produced new missing persons while exacerbating local poverty and political instability—factors that have, themselves, led to more dangerous migrations to Europe and even more missing persons.^{34 35} Meanwhile, the local Islamist group Boko Haram, which has recently taken advantage of crop failures in the Sahel to recruit new members, has been responsible for an infamous campaign of kidnappings.³⁶

THE AMBIGUOUS LIMBO OF THE CLIMATE MISSING

From the perspective of families, disappearance differs from death in that the status of missing kin is unavoidably ambiguous. Without the solace and material evidence of a body, a loved one's death, however, circumstantially probable, remains uncertain. This form of ambiguous loss makes grieving difficult if not impossible, forestalling funerals and pushing many kin of missing persons into a potentially endless search.¹ If a person is declared dead, the wound of disappearance frequently remains unhealed. Years later, against ever thinning odds, many families of the missing still seek some proof of their loved one's life or death.

To some extent, the problem of missing persons is one of unidentified bodies. The missing and the unidentified dead form overlapping populations—'identities without bodies' and 'bodies without identity'.⁵ Identification of the dead is a fundamental ethical and humanitarian obligation owed to surviving families.³⁷ Yet, collectively, every year, millions of unidentified dead are buried in unmarked graves, constituting a global health crisis.³⁸

While the unidentified dead were recognised as a public health concern over a century ago,³⁹ scholars have only recently begun documenting structural inequalities in this identification process. Inequalities, in terms of the attention and resources allocated to specific disappearances, mark our collective response to the missing. This past summer, Western nations were quick to offer up ships to recover the five bodies of those lost in the *Titan* submersible that collapsed while exploring the wreckage of the *Titanic*, and, even several months later, the search for remains continued. The same countries were much less generous in providing aid to recover the remains of

hundreds of migrants who drowned in the sinking of the trawler *Adriana*.

Such a fate is not inevitable. In 2014, Italian officials, together with the University of Milan, launched a pilot study to collect and identify 386 victims of the Lampedusa migrant shipwreck disaster. Funding for the recovery of the corpses was provided by the Italian government, while universities donated personnel and material for forensic identification. Within a little over a year, names had been put to more than 50% of bodies.³⁷ Such success was made possible directly through the willingness of a Western nation to devote resources to the problem. With regards to the climate missing, Western nations have an obligation to mitigate the absences they helped produce through carbon emissions.

FUTURE STEPS: RESEARCH AND POLICY NEEDS

While there is currently no system in place to specifically address climate disappearances, climate change and missingness are both global problems that will need global cooperation to solve. We can begin by gathering better data about these absences—to better understand who becomes missing and under what circumstances—as a first step towards developing a more sophisticated response to the problem. While some, particularly high-income countries, collect data on the missing, these data are incomplete (For a description of some of the ‘data gaps’ around missingness visible in the USA and elsewhere see Lucchesi and Echo-Hawk [2018] and Welch [2012]^{40 41}). And, individuals can become missing within many contexts, including mental illness,⁴² violence⁴³ and homelessness,⁴⁴ yet no reliable data exist to identify which of these factors most frequently contribute to absences. There are basic questions about missingness for which social scientists have no rigorous answers: how many people globally are missing and how did they go missing? How and to what extent do nations support families with missing loved ones? What precise role does climate change play in these disappearances? We also need better evidence of the health toll that disappearance takes on the families of the missing, on which relatively little data exist.

The prospect of developing policies to find the climate missing or avoid them disappearing in the first place raises fraught political, financial and logistical challenges. Finding, counting and identifying post-catastrophic remains through the collection of data from bodies, often requiring the use of sophisticated forensic techniques such as DNA extraction and sequencing combined with outreach to families, can be time-consuming and expensive. Notionally, there exist international pacts that allocate responsibility for the missing, but, in practice, these agreements often go unheeded. Disappearances can often fall into a bureaucratic ‘gray zone’ where no country expends significant resources for their resolution.⁴⁵ Through a lack of money and political will, many

of those who become lost at the border and in the sea are never identified.

There are a number of international organisations devoting resources to the location of missing persons, including the International Committee of the Red Cross, Interpol and the International Commission on Missing Persons, while others, including the WHO, seek to build capacity for post-disaster responses in low-income and middle-income countries. The International Organization for Migration’s Missing Migrants Project, meanwhile, collects data on the phenomenon, though it does not actively participate in investigations. Given their existing expertise and institutional resources, we envision a response to the climate missing working within these existing structures. As the International Committee of the Red Cross has written with regards to the problem of missing migrants, a proper response must be coordinated with the missing’s countries of origin, who can help facilitate communications with families.⁴⁶ Forensic capacity in low-income and middle-income countries could either be built from the ground up or expanded through the use of professionals from Western countries, as has occurred in the investigation of missing persons from conflict and state repression.⁴⁷ In such cases, when missing individuals are almost assuredly dead, the location of remains and confirmation of the death has been established a critical issue of human rights. This mandate to locate the missing could also fall under the purview of an international agency that responds to climate disaster—a so-called ‘Green Cross’—proposed by Lorenzo Marsili (Marsili, Lorenzo. ‘War gave us the Red Cross. Now climate disaster means we need a Green Cross too.’).⁴⁸

Given the considerable overlap between the unidentified dead and the missing, our solutions here focus mainly on identification of the dead rather than on location of the potentially living. The unidentified dead also represent, in theory, a body of open missing persons cases that, through identification, can be solved. While regional police investigations into the climate missing could ultimately be expanded, we suggest beginning with an enhancement of forensics and prevention.

We thus propose that a clear and equitable division of global responsibilities in resolving disappearances would clarify who should take up which tasks. Wealthy states could finance initiatives in less well-resourced countries that accomplish two goals: preventing disappearances before they happen and resolving the fate of those who become missing. This requires sponsoring two types of initiatives: (1) post-impact responses, such as coordinated efforts to quickly resolve missing persons cases, and the practices that allow for the identification of corpses, including funds for coroners and medical examiners to collect biometric data like DNA and fingerprints and (2) preventative activities, such as the construction of resilience infrastructure to mitigate the damage of climate impacts and preclude people from disappearing in the first place.

In the aftermath of a disaster, there are a number of steps that well-resourced states can take to quickly resolve disappearances. After the Hawaii fire, local law enforcement coordinated with federal agencies to send out calls for information about who was missing and under what circumstances they disappeared. The authorities then quickly published a list of the names—crucial information in the search for the disappeared. Phone lines remained open for days to gather information, and investigative teams ran down cases. Forensic analysis also allowed authorities to put names to otherwise unidentifiable bodies. As a result, the number of people still unaccounted for plummeted from hundreds to a few dozen after just a few weeks and a mere seven after just 2 months.⁷ Global South Nations do not have the systems and resources to pull off similar efforts, creating situations such as those in Malawi in which hundreds of missing are, after a few weeks, simply declared dead—a classification that still leaves families, lacking absolute proof of a loved one's demise, in a state of indefinite grief.

Finally, states can also save lives by maintaining existing vital infrastructure and building new protective public works in response to a changing climate, such as flood infrastructure or resilient food supply networks. These measures can prevent deaths and disappearances, both from the collapse of physical structures during extreme weather or the social upheaval in the aftermath. Inequalities are present here, too: Wealthy nations are better positioned to adjust to new climatic conditions such as storms or drought, responses that are usually labelled as adaptation or resilience initiatives. If poorer countries cannot afford these lifesaving measures, it is incumbent on richer nations to help them. After all, wealthier nations bear the historical responsibility for planet-heating carbon pollution and have a moral duty to support more vulnerable countries in dealing with the impacts.

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