

Mass grave mapping and the protection of the dead

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Abstract

The need to respect and (physically) protect the dead is well established under international and national laws and extends to human remains found in mass graves. Once mass graves are discovered, and prior to any investigation, the dead in mass graves should be secured to an extent through the protection of the site itself. Should investigations follow (due to human rights abuses or breaches of international humanitarian

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or international criminal law), then the dead, if excavated, are in the custody and protection of the investigating authorities. Following successful identification of human remains, their return to the next of kin may be possible, or appropriate reburial may ensue.

Engagement with mass graves is complex: no two mass graves are the same, and contexts differ, as may the legal framework governing mass graves. Building on the Minnesota Protocol, international standards for a rights-informed response to human remains found in mass graves are proffered by the Bournemouth Protocol on Mass Grave Protection and Investigation. A new research project now collates information to generate a digital global map of mass graves and asks how and to what extent this holds protective value. Such regularized mass grave mapping was advocated by former United Nations Special Rapporteur Agnès Callamard; indeed, mapping is increasingly employed in human rights contexts as a protection and justice-monitoring measure.

By combining legal, forensic and anthropological insights in responding to the question of data collation in relation to mass graves, this paper sheds light on ways of both conceptualizing and operationalizing digital mapping of mass graves and appraises what kind of protection this may hold for the dead. Structured into four main inter-related sections, the paper briefly anchors data collation as a protection measure under international legal provisions; it then examines the challenges associated with the curation and creation of a global map of mass graves by adopting anthropological, forensic and legal lenses on the subject of mass graves and the data generated surrounding the dead. In a third step, the paper outlines the methodological challenges encountered during the pilot phase of the study, before then offering analysis and discussion on our preliminary findings, where we conclude that the informative value of mass grave mapping holds protective potential, particularly in the absence of physical protection.

As well as offering an original inquiry that fits well with the theme of “protection of the dead”, the paper investigates the very boundaries of protection measures in the context of mass graves and what value they may hold. Such contribution to knowledge and practice is increasingly pressing in situations where physical protection of the dead is not forthcoming, and as an avenue to offer some (albeit incomplete) protection mechanisms for emerging mass grave landscapes: migratory deaths and the threat of mass fatalities arising from extreme climatic events.

Keywords: mass graves, international law, protection, mapping.

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Introduction

In a June 2024 report, Morris Tidball-Binz, the United Nations (UN) Special Rapporteur for Extrajudicial, Summary and Arbitrary Executions, concludes that

“[t]he dignity of a person and the respect to his or her body and human remains do not cease with death”,¹ highlighting the importance of protecting the dead effectively *de jure* and *de facto*. Indeed, provisions for the protection of the dead, as outlined below, can be found in international human rights law, international humanitarian law and international criminal law, though arguably, they are not as such unified or harmonized.² Moreover, in practice, where mass fatalities occur, not every dead body will be investigated, recovered or even identified. This is, perhaps in part, why Agnès Callamard, the former UN Special Rapporteur for Extrajudicial, Summary and Arbitrary Executions, suggested the creation of a regularized global map of mass graves, as this may capture the magnitude and scale but also serve as a record, a repository, to ensure that victims are not forgotten.³

In this paper, the team at Bournemouth University’s Mass Grave Protection, Investigation and Engagement (MaGPIE) project⁴ – a funded research project that is in the process of, *inter alia*, mapping mass graves across the world – connects the generation of a global map of mass graves with the need for protection of the dead. The paper asks: can digital recording on a map be a form of (non-physical) protection of the dead? Based on the premise that international law requires exacting documentation and record-keeping in relation to the dead, the paper offers an analysis of the potential of mass grave mapping as a specific form of protection for the dead. While the focus here is on mass grave mappings specifically, the question has relevance for wider practices of open-source human rights documentation and the possible protection levels that open-source mapping can offer more generally.

The paper is thus framed by international law and its provisions but adopts a multidisciplinary approach, combining legal, forensic and anthropological insights to address the question of data collation in relation to mass graves. Such an approach offers a rich view of what a mass grave can signify: mass graves are sites where human

- 1 Morris Tidball-Binz, *Protection of the Dead: Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions*, UN Doc. A/HRC/56/56, 25 April 2024, para. 60.
- 2 For example, discussions on the dead that seek to combine all branches of law can be found in Welmoet Wels, *Dead Body Management in Armed Conflict: Paradoxes in Trying to Do Justice to the Dead*, graduation thesis, Leiden Law School of Leiden University, 2016; *The Minnesota Protocol on the Investigation of Potentially Unlawful Death (2016)*, UN Doc. HR/PUB/17/4, 2017 (Minnesota Protocol); Melanie Klinkner and Ellie Smith, *The Bournemouth Protocol on Mass Grave Protection and Investigation, 2020* (Bournemouth Protocol), available at: https://issuu.com/bournemouthuniversity/docs/the_bournemouth_protocol_on_mass_grave_protection (all internet references were accessed in May 2025). Legal discussions surrounding the dead have also recently been synthesized under the ambit of dignity in Edward Madziwa, “Advancing Honour and Dignity in Death for Victims of Armed Conflicts: Exploring the Challenges and Opportunities of AI and Machine Learning in Humanitarian Forensic Action under IHL”, *International Review of the Red Cross*, Vol. 106, No. 926, 2024; and in relation to missing persons in Melanie Klinkner, “The Right to the Truth as an Enabler for Missing Persons Efforts”, *Journal of Human Rights Practice*, Vol. 15, No. 1, 2023.
- 3 Agnès Callamard, *Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions on Mass Graves*, UN Doc. A/75/384, 12 October 2020.
- 4 MaGPIE is a five-year project that critically engages with the challenges and complexities posed by mass graves across the world. It brings together a multidisciplinary team of expert practitioners and academics to conduct world-leading, pioneering research for the benefit of victims, families and affected communities. See the MaGPIE website, available at: <https://magpie.bournemouth.ac.uk>.

remains have been disposed of, suffering and mourning occurs, evidence for the pursuit of justice is collated, and investigative, forensic activities take place, and they are often included in social and political narratives. In addition to multiple rationalities, they are also subject to change, as the paper will demonstrate with reference to Kozluk, a site related to the Srebrenica massacre. Through these different lenses of law, forensic science and anthropology, coupled with the conducting of a pilot study, the paper outlines the challenges that digital mapping of mass graves present.

The term “mass grave” is as yet undefined in international law and can evoke a number of associations, from the archaeological notion of a structure in the ground to a certain shock value in relation to crimes and atrocities committed at scale. Our project builds on the definition contained in the *Bournemouth Protocol on Mass Grave Protection and Investigation* (Bournemouth Protocol). While the Bournemouth Protocol is not itself a legal document, it proffers the following legally informed definition of a mass grave:⁵

a site or defined area containing a multitude (more than one) of buried, submerged or surface-scattered human remains (including skeletonised, commingled and fragmented remains), where the circumstances surrounding the death and/or body disposal method warrant an investigation as to their lawfulness.

This definition has since been used in several UN documents⁶ and is used for the purposes of this article because it transcends the various branches of international law and attests to multiple, possibly concurrent, commissions of crimes without predetermining which one is at issue (which often can only be determined after a full and effective investigation). Importantly, the definition connects to potentially unlawful event(s); therefore, investigations, documentation and mapping of mass graves will shed light on such events. Since the definition presupposes more than one set of human remains, it complements existing instruments designed to deal with unlawful death, and importantly offers a strong foundation for a legally framed project such as MaGPIE.

The paper begins with a brief overview of the legal provisions contained in the three branches of international humanitarian law, international human rights law and international criminal law. Here the paper highlights that “recording of the dead” provides a common thread and is often a precursor for physical protection. The paper then moves to the context of mass graves. By highlighting the complexities surrounding mass graves, the paper outlines how digital mapping must grapple with the wealth of information that they may contain whilst ensuring a rights- and forensically informed approach to mapping that is cognizant of its situatedness. Through a discussion of a pilot study, the article then teases out further methodological challenges as well as preliminary findings. Finally, in dissecting and

5 Bournemouth Protocol, above note 2, p. 4.

6 See, for example, A. Callamard, above note 3; *Report of the Independent Fact-Finding Mission on Libya*, UN Doc A/HRC/49/4, 23 March 2022. As with any definition, we acknowledge limitations and that beneath the overarching definition of a mass grave (as opposed to a mass burial), a multitude of subcategories in relation to grave types, structures and causation exist which warrant further attention.

analyzing the project's multidisciplinary and methodological approach, the paper explores the extent to which mapping offers accurate and dignified acknowledgment that facilitates protection, in the sense that it protects important data points and facts surrounding the mass grave, and with it, the dead. These data points, in turn, are essential for preserving knowledge about the dead, if not their physical human remains.

International legal protection

The idea that the dead and their remains deserve respectful treatment is deeply embedded in human communities across regions and eras. Families and communities usually gather to honour their dead through different kinds of practices and rituals that, while differing in form and purpose, aim at providing dignified treatment to human remains. This is reflected in the regulations governing lawful methods and places of disposal of human remains. All countries have detailed national laws regulating the treatment of the dead, and the relevant requirements are enshrined in international and regional human rights instruments.⁷

Reflective of this need to honour the dead, international law offers provisions for protection. Exposition and analysis of the existing legislative framework is amply offered elsewhere;⁸ therefore, here the paper only briefly canvases the core provisions under international humanitarian, human rights and criminal law that require the physical protection of human remains, before highlighting the provisions that all three branches have in common: the collation and preservation of information on, and records of, the dead.

International humanitarian law has specific regulations for the search for the dead⁹ and the missing,¹⁰ establishing that parties to the conflict must record all identifying information before a burial of human remains¹¹ and must then transmit

7 M. Tidball-Binz, above note 1.

8 See e.g. W. Wels, above note 2; M. Tidball-Binz, above note 1. Specifically for mass graves, see Melanie Klinkner, "Mass Grave Protection and Missing Persons", in Roberto C. Para and Douglas H. Ubelaker (eds), *Anthropology of Violent Death: Theoretical Foundations for Forensic Humanitarian Action*, 1st ed., John Wiley and Sons, Hoboken, NJ, 2023; M. Klinkner, above note 2.

9 Geneva Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field of 12 August 1949, 75 UNTS 31 (entered into force 21 October 1950) (GC I), Art. 15; Geneva Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea of 12 August 1949, 75 UNTS 85 (entered into force 21 October 1950) (GC II), Art. 18; Geneva Convention (IV) relative to the Protection of Civilian Persons in Time of War of 12 August 1949, 75 UNTS 287 (entered into force 21 October 1950) (GC IV), Art. 16; Protocol Additional (I) to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts, 1125 UNTS 3, 8 June 1977 (entered into force 7 December 1978) (AP I), Art. 17(2); Jean-Marie Henckaerts and Louise Doswald-Beck (eds), *Customary International Humanitarian Law*, Vol. 1: *Rules*, Cambridge University Press, Cambridge, 2005 (ICRC Customary Law Study), Rule 112, available at: <https://ihl-databases.icrc.org/en/customary-ihl/rules>.

10 AP I, Art. 33(2); ICRC Customary Law Study, above note 9, Rule 117.

11 ICRC Customary Law Study, above note 9, Rule 116; GC IV, Arts 129–131, 136–139; GC I, Arts 16–17; GC II, Arts 19–20; Geneva Convention (III) relative to the Treatment of Prisoners of War of 12 August 1949, 75 UNTS 135 (entered into force 21 October 1950) (GC III), Arts 120–122.

that information to the relevant party to the conflict.¹² It requires the marking, maintenance and protection of gravesites¹³ to enable preservation of the body so that identification and return may be possible in the future, and poses the need to take all possible measures to prevent the dead from being despoiled, including the respectful disposal and return of remains.¹⁴ Informed by the principle of humanity attached to humanitarian work, organizations such as the International Committee of the Red Cross (ICRC) have also developed manuals and guidelines for the dignified management of the dead and human remains in disaster situations, thereby expanding into scenarios other than those of armed conflict.¹⁵

International human rights law offers somewhat less in terms of protection. That said, in the context of enforced disappearances which historically have often been found to result in the death of those disappeared, more prescription can be discerned. The International Convention for the Protection of All Persons from Enforced Disappearance (CED) establishes a requirement to investigate enforced disappearances when there are grounds to believe that they have occurred,¹⁶ prescribing that the authorities have the necessary powers and resources to conduct investigations effectively, including access to documentation and any relevant information,¹⁷ with particular emphasis on due diligence and the protection of evidence. The CED requires States to take all appropriate measures to search for, locate and release disappeared persons, posing a duty on the authorities to keep official records of all persons deprived of their liberty,¹⁸ and in the event of death, to locate, respect and return their remains.¹⁹ In addition, jurisprudence from the regional courts offers specificity not explicitly found in treaty law to ensure that all reasonable steps are taken to secure the evidence.²⁰

For the third branch of international law, accountability then becomes the main concern. Under international criminal law,²¹ in relation to the dead, all possible lines of inquiry, including eyewitness testimony and forensic evidence, should be diligently explored, so that an accurate record of injury, cause of death

12 Specifically, GC I, Art. 16(3); GC II, Art. 19(3); GC III, Art. 120(2), 120(6); GC IV, Arts 129(2)–(3), 138.

13 AP I, Art. 34(2)(b); ICRC Customary Law Study, above note 9, Rule 116.

14 ICRC Customary Law Study, above note 9, Rules 113, 115, which in turn rely on GC I, Art. 15(1); GC II, Art. 18(1); GC IV, Art. 16. For an academic appraisal, see Anna Petrig, “The War Dead and Their Gravesites”, *International Review of the Red Cross*, Vol. 91, No. 874, 2009.

15 Stephen Cordner, Rudi Coninx, Hyo-Jeong Kim, Dana van Alphen and Morris Tidball-Binz. (eds), *Management of Dead Bodies after Disasters: A Field Manual for First Responders*, 2nd ed., Pan American Health Organization et al., Geneva, 2016; ICRC, *Guiding Principles for Dignified Management of the Dead in Humanitarian Emergencies and to Prevent Them Becoming Missing Persons*, Geneva, 2021.

16 International Convention for the Protection of All Persons from Enforced Disappearance, 2716 UNTS 3, 20 December 2006 (entered into force 23 December 2010) (CED), Art. 12(2).

17 *Ibid.*, Art. 12(3)(a).

18 *Ibid.*, Art. 17(3).

19 *Ibid.*, Art. 24(3).

20 See ECtHR, *Treskavica v. Croatia*, Appl. No. 32036/12, Judgment, 12 April 2016. In addition, the *Guiding Principles for the Search for Disappeared Persons* make specific reference to the dignified treatment of human remains: *Guiding Principles for the Search for Disappeared Persons*, UN Doc. CED/C/7*, 8 May 2019.

21 See, specifically, International Criminal Court, *Elements of Crimes*, 2013, Arts 8(2)(b)(xxi), 8(2)(c)(ii).

and the circumstances surrounding the death can be established. Guidelines exist on how to investigate the circumstances of death²² and also how to document them.²³

Importantly, for each branch of international law, record-keeping forms a crucial element, often required to facilitate physical protection. There is a clear expectation that remains will be disposed of respectfully, with graves being maintained and respected and the location of the graves being marked,²⁴ and this is only possible if accurate records are kept; indeed, the keeping of such records is a precondition for the implementation of physical protection.

Jurisprudence also touches on the subject of record-keeping. For example, in the *Varnava* case before the European Court of Human Rights (ECtHR), the preservation of all information in relation to exhumation and identification was highlighted.²⁵ Moreover, non-provision of information on the deceased to families or relatives can in itself amount to inhuman treatment²⁶ and a breach of their right to know.²⁷ The Inter-American Court of Human Rights (IACtHR) also suggests that the information ascertained through an investigation about the dead should be made known, particularly where the dead are anonymous. Promulgation, so the rationale goes, may assist in eliciting vital information about the unidentified dead,²⁸ thereby advancing individuation. Care to the as-yet-anonymous dead is thereby offered with a view that, on identification, families can engage with appropriate burial rites and “protect” their loved ones in that way. Fundamental here is the recording, elicitation and preservation of information.

Moreover, to support the CED, guiding principles have been developed in relation to the search for disappeared persons,²⁹ as much hinges on the coordinated, prolonged efforts to locate those that have gone missing. Principle 11 is dedicated to information-gathering and -processing strategies, noting that “[i]nformation on the search should be recorded in a complete, thorough and appropriate manner”³⁰ and extends to information on the dead.

22 Minnesota Protocol, above note 2.

23 Eurojust, Network for Investigation and Prosecution of Genocide, Crimes against Humanity and War Crimes, and International Criminal Court, *Documenting International Crimes and Human Rights Violations for Accountability Purposes: Guidelines for Civil Society Organisations*, The Hague, 2022.

24 ICRC Customary Law Study, above note 9, Rules 115–116.

25 Information preservation is mentioned in ECtHR, *Varnava and Others v. Turkey*, Judgment, 18 September 2009, para. 19 (in relation to oversight by the Committee of Ministers of the Council of Europe on *Cyprus v. Turkey*): “... moreover the importance of preserving all the information obtained during the Programme of Exhumation and Identification carried out by the CMP ...”.

26 See e.g. *Fatima Rizvanović and Ruvejda Rizvanović v. Bosnia and Herzegovina: Communication No. 1997/2010 (2014)*, UN Doc. CCPR/C/110/D/1997/2010, 23 April 2014.

27 Melanie Klinkner and Howard Davis, *The Right to the Truth in International Law: Victims’ Rights in Human Rights and International Criminal Law*, 1st ed., Routledge, London, 2020; Howard Davis and Melanie Klinkner, “Investigating across Borders: The Right to the Truth in a European Context”, *International Journal of Human Rights*, Vol. 26, No. 4, 2022.

28 IACtHR, *Mapiripán Massacre v. Colombia*, Judgment, 15 September 2005, para. 306.

29 *Guiding Principles for the Search for Disappeared Persons*, above note 20.

30 *Ibid.*, Principle 11(1).

Further support for the need to gather and preserve information on the dead can perhaps also be gleaned from UN Security Council Resolution 2474 of 2019, which recognizes the importance of scientific and technological progress in the search for, and identification of, missing persons. It encourages States “to advance forensic scientific and methodological efforts for the recovery, identification and management of bodies or human remains in a way that respects human dignity”.³¹ Digital records and databases form a crucial part of implementing such a strategy.³²

The point worth stressing here for the purpose of the present paper’s argument is as follows: the preservation of information, facts and, for accountability purposes, evidence forms a crucial, if sometimes only implicit, element of protection across the three branches of international law under discussion. As such, mapping is neither novel nor controversial, for detection and protection of mass graves has long encompassed digital evidence or remote surveillance.³³ Indeed, in the age of open-source investigations, digital mapping has become a common tool for evidencing, preserving and visualizing information.³⁴ This leads to the next element of the paper, which relates to the question: how might digital mapping of mass graves grapple with the complex and often voluminous legal, forensic and anthropological data involved?

Mass graves and their complexity: Multidisciplinary lenses on information, data and the mapping thereof

Unidentified bodies and human remains are a significant societal challenge across the world,³⁵ and some of those bodies end up in mass graves. As held by the IACtHR, disposing of bodies in mass graves can in itself be demeaning for the victims and distressing to surviving family members.³⁶

31 UNSC Res. 2474, 11 June 2019, para. 17.

32 See e.g. Adnan Rizvic *et al.*, “Managing Large Volume Data Sets in the Process of Identifying Missing Persons: Contributions from the International Commission on Missing Persons”, *Journal of Forensic Sciences*, Vol. 69, No. 5, 2024. For a discussion on the processes involved, see Mercedes Salado Puerto *et al.*, “The Search Process: Integrating the Investigation and Identification of Missing and Unidentified Persons”, *Forensic Science International: Synergy*, Vol. 3, 2021; Ute Hofmeister, Shuala Martin, Carlos Villalobos, Juliana Padilla and Oran Finegan, “The ICRC AM/PM Database: Challenges in Forensic Data Management in the Humanitarian Sphere”, *Forensic Science International*, Vol. 279, 2017.

33 Bournemouth Protocol, above note 2. And now expanding into new areas, see Perla Santillán, Scott Edwards, Jenise Swall and Tal Simmons, “Mass Grave Localization Prediction with Geographical Information Systems in Guatemala and Future Impacts”, *Journal of Forensic Sciences*, Vol. 67, No. 1, 2022; Nicholas Hermann and Joanne Devlin, “Assessment of Commingled Human Remains Using a GIS Based Approach”, in Bradley Adams and John Byrd (eds), *Recovery, Analysis and Identification of Commingled Human Remains*, Humana Press, New York, 2008, pp. 257–258; Mimi Onouha, “Machine Learning Is Being Used to Uncover the Mass Graves of Mexico’s Missing”, *Quartz*, 19 April 2017, available at: <https://qz.com/958375/machine-learning-is-being-used-to-uncover-the-mass-graves-of-mexicos-missing>.

34 “Mapa de fosas”, Juntadeandalucia.es, available at: www.juntadeandalucia.es/organismos/turismoculturaydeporte/areas/cultura/memoria-democratica/fosas.html; Balkan Investigative Reporting Network (BIRN), “Bitter Land: Interactive Map of Mass Graves from the Wars in the Former Yugoslavia”, available at: <https://massgravesmap.balkaninsight.com>.

35 Some also call it a health crisis: see Halina Suwalowska *et al.*, “‘The Nobodies’: Unidentified Dead Bodies – a Global Health Crisis Requiring Urgent Attention”, *The Lancet*, Vol. 11, No. 11, 2023.

36 IACtHR, *Nadège Dorzema et al. v. Dominican Republic*, Judgment, 24 October 2012, para. 117.

Protection of mass graves is essential and, as outlined above, should be forthcoming: prior to any investigation, the dead in mass graves are secured (to an extent) through the protection of mass grave sites. This will help preserve the integrity of human remains as well as safeguard evidence and associated lines of inquiry to facilitate, where relevant, expert investigations. Should investigations follow (due to human rights abuses or breaches of international humanitarian or international criminal law), then the dead, if excavated, are in the custody and protection of the investigating authorities. Following successful identification of human remains, their return to the next of kin may be possible, or appropriate reburial may ensue.

There are a number of questions that arise for the creation of a global digital map, most pertinently: what information should be collated, and how? What happens in cases where little to no physical protection is afforded to sites or human remains in suspected mass graves? And where verification, protection and investigations have taken place, what role then is there for mass grave mapping? Moreover, how can data gathering uniformly and consistently capture the wide spectrum of mass graves that exist to generate a regularized global mass grave map?

In the following sections, the authors offer reflections on the situatedness of mass graves to account for the multiple meanings that mass graves may hold at any given time. They then offer an outline of legal considerations and forensic foundations underpinning the development of a global map of mass graves, before venturing into practical and methodological considerations that arose during a pilot scheme conducted between December 2023 and April 2024 as part of the MaGPIE project.

Reflecting on the situatedness of a mass grave

In line with our adopted definition, mass graves are undoubtedly sites of huge complexity. Through our definition, we distinguish them from the practice of mass burial, which is understood as a “methodical, multistage, multidisciplinary procedure which should be performed cautiously by skilled and pre-trained personnel” and where thus no issue of illegal activity arises.³⁷ Therefore, an understanding of a given mass grave must take into account that the mass grave may signify a multitude of meanings: a site of violence, crime and/or terror, a space for the enactment of justice, a moment for reflection or commemoration – but also a place of aberrance and alterity which can “serve different political interests at the same time”.³⁸

Mass graves have connections to the present and the living. The dead, their human remains, are symbolic of past and present violations that persist and endure,

37 Clifford Perera and Chris Briggs, “Guidelines for the Effective Conduct of Mass Burials Following Mass Disasters: Post-Asian Tsunami Disaster Experience in Retrospect”, *Forensic Science Medicine and Pathology*, Vol. 4, No. 1, 2008, p. 8. Naturally, standards on what constitutes appropriate burial have also evolved over time and this ought to be taken into account, particularly where practice predates principles, methods and training.

38 Kirsten Juhl and Odd Einar Olsen, “Societal Safety, Archaeology and the Investigation of Contemporary Mass Graves”, *Journal of Genocide Research*, Vol. 8, No. 4, 2006, p. 414.

especially where perpetrators have sought to conceal them. This is perhaps most pronounced when mass graves remain uninvestigated. In the absence of knowledge about the events that have resulted in a mass grave and about the location of the grave itself, and where there is a lack of complete human remains, the absence of the dead can “imply and direct attention towards presence”.³⁹ This is particularly relevant where mass graves contain missing persons, since the uncertainty of the status of missing persons means that grief is unresolved, leaving survivors in a state of what has been described as ambiguous loss.⁴⁰ In this way, the dead impinge on the realms of the living, continuing to have a “fundamental role in society”,⁴¹ and a mapping project on mass graves should be aware of, and responsive to, such dynamics.

Indeed, complexities surrounding mass graves may change throughout a gravesite’s life cycle and as investigations progress, as exemplified by efforts to identify the dead: the scientific and forensic analysis “re-inscribes” human identity and personal histories onto remains, establishing links between living survivors and dead victims.⁴² Subsequently, identification allows survivors to reintegrate victims socially as dead members of the community through funeral practices and other socio-cultural and religious practices associated with commemoration.⁴³ These personal histories are then integrated with other forms of evidence (political, archaeological, social and forensic) to relate the past to the present.⁴⁴ Such complexities highlight the need to capture, to collate, to record, to identify, to connect, in an attempt to protect the sites themselves, the human remains and the information that exists about them. This not only presents challenges in terms of capturing information and data, but also points to the importance of doing so responsibly.

Just mapping

In light of the complexity of mass grave recording and the significance of documentation to multiple actors and disciplines, it is clearly imperative that any work is conducted in a way that is safe for all actors, potentially affected parties and the site itself, as well as for the repository of information, particularly data concerning human identification and the crime scene. It was therefore essential that the MaGPIE

39 Mikkel Bille, Frida Hastrup and Tim Flohr Sørensen, “Introduction: An Anthropology of Absence”, in Mikkel Bille, Frida Hastrup and Tim Flohr Sørensen (eds), *An Anthropology of Absence: Materialisations of Transcendence and Loss*, Springer, New York, 2010, p. 4.

40 Pauline Boss and Carla Dahl, “Family Therapy for the Unresolved Grief of Ambiguous Loss”, in David Kissane and Francine Parnes (eds), *Bereavement Care for Families*, Routledge, New York, 2014.

41 Carl Öhman, “The Post-Mortal Condition: Being with the Dead in the Age of Digital Media”, PhD thesis, Oxford Internet Institute, University of Oxford, 2020, p. 7.

42 Admir Jugo and Sari Wastell, “Disassembling the Pieces, Reassembling the Social: The Forensic and Political Lives of Secondary Mass Graves in Bosnia and Herzegovina”, in Elisabeth Anstett and Jean-Marc Dreyfus (eds), *Human Remains and Identification: Mass Violence, Genocide, and the “Forensic Turn”*, Manchester University Press, Manchester, 2015, p. 161.

43 Lee Douglas, “Mass Graves Gone Missing: Producing Knowledge in a World of Absence”, *Culture and History Digital Journal*, Vol. 3. No. 2, 2014, p. 3.

44 Inter-American Commission on Human Rights, Res. 3/2019, “Principles on Public Policies on Memory in the Americas”, 2019, p. 3.

team was cognizant of the various risks of mapping mass grave sites before it began to progress towards the development of a global map of sites. The team was able to rely on foundational work in relation to rights-informed mass grave mapping⁴⁵ that addressed the question of what might render a mapping endeavour safe for all parties engaged and affected by such mapping. From the outset, core principles such as “do no harm”, independence and impartiality, transparency, accuracy and reliability, and physical and emotional safety for all involved in the engagement with mass graves are key prerequisites for responsible engagement with mass graves.⁴⁶ Also crucial are the rights that arise during all stages of mapping, from planning and collection of data to decisions on publication format. Previous research offers guidance⁴⁷ on rights such as the right to an effective investigation, equality and non-discrimination, the right to privacy and the right to an effective remedy and reparations, whilst also identifying where the rights of victims, the wider community or society and the alleged perpetrators come into play.

Based on this prior work and through reviewing numerous human rights mapping projects, it became clear that the purpose of many mapping projects was (1) to further justice and accountability and (2) to assist memorialization, but also (3) to protect, often through awareness-raising, both sites and people.⁴⁸ Particularly the protection aspect, which connects neatly to the discussion later in this article, is starkly expressed by the Middle East and North Africa-focused Sites of Conscience project with the following statement:

Across the Middle East and North Africa, prisons, checkpoints and former clandestine sites of torture are at risk of destruction or deterioration. Erasing this past will prevent new generations from learning critical lessons and destroy opportunities to build a peaceful future in the region – and the world.⁴⁹

These fears are not unfounded, because sites are at risk of being forgotten, destroyed or built upon.⁵⁰ Through documenting, protection is sought, including for those that may still be interred at sites. The protection argument is thus important in contexts where State protection may not be available. The reverse, however, can also be true, whereby destruction of a site can be the result of highlighting the site in the first

45 Melanie Klinkner and Ellie Smith, *Rights-Informed Mass Grave Mapping: A Guide to the Use of Mapping Tools*, MaGMap, 30 August 2024; Melanie Klinkner, Ellie Smith and Rebecca Harris, “Rights-Informed Mass Grave Mapping”, *International Journal of Law in Context*, Vol. 21, No. 1, 2025.

46 M. Klinkner and E. Smith, above note 45. Since the MaGPIE project is concerned with open-access material readily available in the public domain, the principle of confidentiality is less applicable to the project. That said, any sensitive and confidential material when encountered should always be dealt with cautiously and secured accordingly.

47 *Ibid.*

48 *Ibid.*

49 See the Mapping MENA website, available at: <https://mappingmena.org>.

50 Yara El Murr, “The Desperate Last-Ditch Search for Lebanon’s Missing War Victims”, *The Guardian*, 27 February 2024, available at: www.theguardian.com/global-development/2024/feb/27/the-desperate-last-ditch-search-for-lebanons-missing-war-victims. See also Derek Congram, Michael Kenyhercz and Arthur Gill Green, “Grave Mapping in Support of the Search for Missing in Conflict Contexts”, *Forensic Science International*, Vol. 278, 2017.

instance, for example through aerial imagery; careful consideration thus needs to be given to protection elements as part of mapping.

When protection as part of investigations has been forthcoming, the dynamic nature of processes associated with mass graves come to the fore. Thus, it is equally important that the mapping team is completely cognizant of the full life cycle of the mass grave – that is, from depositing of human remains, attempted destruction of graves, and discovery, to investigation, identification, return and commemoration activities – something that will be further evidenced in the exposition on Kozluk below.

Forensic investigations at Kozluk (Bosnia and Herzegovina) as an example of connecting mass grave events with changing evidence

Collating information from mass graves is a daunting task, as exemplified by the wealth and variety of information available in relation to just one event at Kozluk, which resulted in a number of mass graves, some of the many pertaining to the “Srebrenica killings”⁵¹ that occurred in Bosnia and Herzegovina in the summer of 1995. Whilst it is commonly understood that there is no such thing as a typical mass grave, the mass grave site at Kozluk has many features that bring to the fore complex considerations which need to be given to data points for mapping. Excavated in 1999 and 2015–16, the area described (repeatedly) by the International Criminal Tribunal for the former Yugoslavia (ICTY) as the “execution site”⁵² at Kozluk, a rubbish dump on the banks of the Drina river, includes four defined primary graves with links to five secondary graves. The location of Kozluk as a mass grave site was first determined in 1998 based on evidence from one secondary grave that provided a geographical proximity, leading investigators to pinpoint the primary graves. Subsequent excavation of secondary graves along Cancari Road south of Zvornik (between 1998 and 2009) connected a further four graves to Kozluk.⁵³ Evidence from the Kozluk mass grave sites has featured in various trials,⁵⁴ meaning that forensic reports relating to Kozluk are readily available in the public domain. These materials include information on cause and manner of death, as well as illegal disposal, deliberate disturbance and grave robbing.⁵⁵ The Kozluk excavations resulted in a significant identification success rate.⁵⁶

51 International Criminal Tribunal for the former Yugoslavia (ICTY), *Prosecutor v. Karadžić*, Case No. IT-95-5/18-T, Public Redacted Version of Judgment, 24 March 2016, paras 5339, 5373, 5403, 5451, 5520.

52 *Ibid.*, paras 5397–5401.

53 Excavations for the ICTY revealed remains buried with fragments of green bottle glass, bottle labels and river sand and gravel, which constituted linkage evidence to the dumping ground of waste materials from the Vitinka drink bottling factory in Kozluk. ICTY, *Prosecutor v. Popović et al.*, Case No. IT-05-88-T, Judgment, 10 June 2010, para. 523 fn. 1924.

54 See, for example, ICTY, *Karadžić*, above note 51, paras 5413, 5422.

55 Richard Wright, *Report on Excavations and Exhumations at Kozluk in 1999 with Appendix on Visits to Konjevici and Potocari*, Report to ICTY, 2000. See also ICTY, *Popović*, above note 53.

56 See, for example, Kathryn Bomberger, “More Remains Can Be Found; More Identifications Can Be Made”, International Commission on Missing Persons, 12 January 2016, available at: www.icmp.int/news/more-remains-can-be-found-more-identifications-can-be-made-2/.

Kozluk exemplifies the importance of connecting events surrounding mass graves as well as investigation of human remains, evidence and the associated changing information and changing landscape. Events around Kozluk concerning the capture, detention, execution, burial and reburial of victims have since been extensively summarized in judgments and scholarly materials.⁵⁷ Disturbance and reburial resulted in the dispersal of victims (if river recoveries are included) to an estimated twenty-nine sites of body disposal where the remains of victims were recovered. In sum, the known initial events that took place at Kozluk, and all related and subsequent events, are well documented in terms of mass grave investigation,⁵⁸ legal findings⁵⁹ and open-source documentation and analysis.⁶⁰ To adequately capture the complexity of these events, data entry points have to allow for the connection between primary and secondary graves as well as types of graves. Data entry points ought to also reflect the kind of evidence that can be retrieved from dissociated dead bodies and human remains, including evidence on cause and manner of death as well as identification.⁶¹

Investigation processes take time, and in the case of Kozluk, several excavations took place: two at the primary grave site, five at secondary graves, and further excavations at a number of surface sites and graves where remains recovered from the river were interred. By 2016, through the investigation processes, with accumulated identification data changing the numbers of victims, and re-assessments and further investigations connecting primary and secondary graves, a minimum of 864 DNA profiles had been connected to events at Kozluk. Only seventeen profiles were reported without DNA matches to families.⁶² Data collation thus has to be mindful of changing evidential matters.

Kozluk exemplifies the challenges for accurate information on the dead. Identifications accumulate over time, but trials may reach different conclusions based on material presented to them at any given time, and open-source material may not always be updated or forthcoming. This poses significant challenges for accurate data assemblage as, for example, identification numbers change over time. The admirable work undertaken by the Bitter Lands project serves as an example: the project's figure of 807 identified individuals comes from tallying the identified totals for all the Kozluk assemblage graves on its website,⁶³ but these numbers differ from those offered in a 2013 investigative report produced for the ICTY.⁶⁴

57 For a full account, see Ian Hanson, "Anatomy of a Grave: The Kozluk Excavations as an Exemplar of a Successful Mass Grave Investigation", in Ellie Smith and Melanie Klinkner (eds), *Mass Graves, Truth and Justice: Interdisciplinary Perspectives on the Investigation of Mass Graves*, Edward Elgar, Cheltenham, 2023; ICTY, *Popović*, above note 53; ICTY, *Karadžić*, above note 51.

58 ICTY, *Srebrenica Investigation: Update to the Summary of Forensic Evidence*, 28 June 2013, available at: <https://srebrenica.sense-agency.com/assets/exhumations/sg-2-08-summary-eng.pdf>.

59 ICTY, *Prosecutor v. Mladić*, Case No. IT-09-92-T, Judgment, Vol. 3, 22 November 2017.

60 BIRN, above note 34.

61 M. Salado Puerto *et al.*, above note 32.

62 I. Hanson, above note 57, p. 74 fn. 128.

63 BIRN, "Bitter Land: Kozluk", 2020, available at: <https://massgravesmap.balkaninsight.com/map/>.

64 ICTY, above note 58.

Definitions or nomenclature can also present an issue. The description of dead bodies and body parts as “cases”, “bodies”, “body parts”, “remains” and “individuals” makes comparison across documents and sites difficult, and descriptions change over time. For example, the widely reported fifty-five cases of remains recovered from the 2015 Kozluk excavation were actually found to contain body parts of sixty-five individuals after DNA sampling.⁶⁵ At the same time, ambiguity in the way terms are used risks misrepresentation of facts.

The wealth of information available for events such as Kozluk is impressive: the final resting place of each individual identified, their possessions and related evidence of cause of death can be tabulated and illustrated as a way to further understand what happened and refute certain narratives. Moreover, assessment of location data of identified victims can assist in determining associations with those still missing, thereby enabling future identification and return of human remains. Armed with this knowledge to capture multifaceted information, capable of reflecting events and changing evidence, the MaGPiE team set out to conduct a pilot study on mass grave mapping.

The MaGPiE pilot study

For many sites across the world, information and documentation – such as is available for Kozluk – does not exist. To juxtapose a country context such as Bosnia and Herzegovina with a context where mass graves are known to exist but few scientific excavations (let alone return of human remains or accountability processes) have taken place, Sri Lanka was chosen as a useful counterpart.⁶⁶ Bosnia and Herzegovina’s mass graves are well documented through comprehensive investigations, including detailed archaeological and anthropological forensic findings.⁶⁷ Conversely, the longevity and protracted nature of Sri Lanka’s thirty-year conflict and history of political unrest have resulted in limited progress in investigations, prosecutions and reparations related to mass graves. [Figure 1](#) offer a snapshot of the grave

65 I. Hanson, above note 57, p. 72.

66 Journalists for Democracy in Sri Lanka, Families of the Disappeared, Center for Human Rights and Development and International Truth and Justice Project, *Mass Graves and Failed Exhumations in Sri Lanka*, June 2023.

67 Many stakeholders offer information about specific mass graves sites in the former Yugoslavia. For instance, the global archive OCCRP Aleph contains court records, forensic reports and a whole archive of ICTY related documents; see OCCRP Aleph, “UN ICTY Court Records”, available at: <https://aleph.occrp.org/datasets/182>. Other court records related to the ICTY procedures can be located in the Unified Court Records database, available at: <https://ucr.irmct.org/>. The Blinken Open Society Archives (Blinken OSA) contain a collection of more than 100 forensic reports redacted by Physicians for Human Rights related to the earliest stages of missing persons investigations: see Blinken OSA, “HU OSA 386-2-2 Findings”, available at: <https://catalog.archivum.org/catalog/OoML3p6l?tab=content>. The International Commission on Missing Persons (ICMP) offers periodical updates about its progress in finding missing persons; see ICMP, “About ICMP”, available at: <https://icmp.int/about-icmp/>. Among other initiatives, the Bitter Land project by BIRN is an interactive map of mass graves which offers information about Bosnia and Herzegovina, Croatia and Kosovo, backed up by forensic reports, court records and other sources; see above note 34. The Operational Team of the Republic of Srpska for Tracing Missing Persons has published a database containing the findings of its investigations, available at: www.nestalirs.com/indexcir.html.

sites recorded for both country contexts, also taking into account mass burials as a result of the 2006 tsunami. In [Figures 1, 2 and 3](#), mass graves are listed or marked according to their current status as follows:

- **Excavated**, if they have been fully investigated;
- **Investigated/Partially investigated**, when some progress has been made but investigations have not yet been completed;
- **Mass burial**, if the mass grave is the consequence of a natural disaster but the body disposal method raises some concerns about its due process;
- **Recorded**, if the site has been recorded but no investigation has been conducted yet;
- **Witnessed**, if only witness statements sustain the existence of a site;
- **Disproven**, if no evidence of unlawful behaviour has been found at an alleged gravesite and the report has been disproven.

A primary challenge was to create a data collection framework that could effectively capture essential information about mass graves in both contexts. This involved finding a balance between comprehensiveness and flexibility. A first step was to produce a clear data template (created in Microsoft Lists) with the ability to capture data entry points in relation to the site, victims (including victim numbers and cause of death), investigation efforts and associated events (pre- and post-mass grave creation). After agreeing on a set of data points⁶⁸ that reflects the full life cycle of a mass grave, from discovery to potential return of human remains and commemoration, the team developed a “traffic light” system to categorize the quality and reliability of its data sources. Court documents, forensic reports and official reports from truth commissions and institutions (both domestic and international) were classified as the highest tier, offering the most reliable information. While academic publications and media reports were included as supplementary sources, they were recognized as potentially having lower levels of reliability.

Mass grave investigations draw on expertise from many disciplines, so sources coming into the ambit of consideration range from highly technical to journalistic, and this may result in very different ways of describing and categorizing information. This lack of standardization in discussing and engaging with data poses significant challenges when attempting to compile information into a single, unified framework.

Firstly, there is often a lack of availability and accessibility of official reports, and even when such reports are present, inconsistencies in naming conventions and data collection can make cross-referencing sources a particularly difficult and time-consuming task. This fragmentation makes it hard to consolidate information and evidence related to a specific location, and to track its history across various investigations. Furthermore, in Bosnia and Herzegovina, the phenomenon of “primary” and “secondary” graves, as highlighted in the Kozluk example, is common. For forensic anthropologists, the challenge of calculating accurate victim numbers when

68 The project operates now with a maximum of forty-eight data points per site.

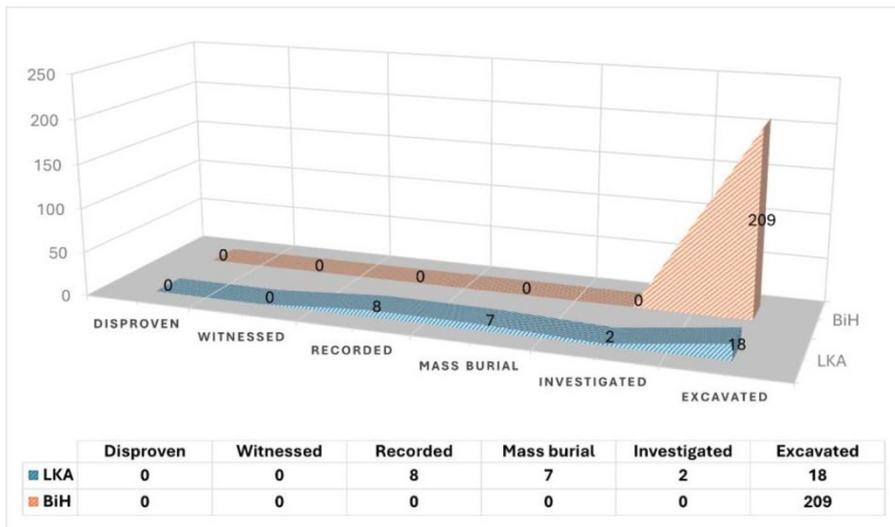


Figure 1. Mass grave status in Sri Lanka (LKA) and Bosnia and Herzegovina (BiH). Source: MaGPiE, 2024.

bodies are disarticulated, and when DNA links span multiple gravesites, becomes particularly acute.⁶⁹ Differing methods of calculating victim numbers can lead to seemingly mismatching and conflicting figures. Trials related to the Srebrenica genocide were marred by claims from the defence of inflated figures in cases where the number of remains found exceeded the number of DNA identifications.⁷⁰ Our research revealed a proportionate relationship: the more complex a mass grave site is, the larger the space it creates for contestations, with potential exploitation and propaganda ensuing.⁷¹

Secondly, the remote and unmarked nature of many mass graves presents difficulties for accurate geo-localization. Language barriers and historical name changes further complicate this process, rendering some locations unrecognizable on modern maps. Even accurate translations might not capture the nuances of local place names. In Sri Lanka, mass graves are often hidden beneath newly constructed

69 A. Jugo and S. Wastell, above note 42; Anes Jogunčić, Adis Salihbegović, Emina Dervišević and Nermin Sarajlić, “Challenges Associated with Investigating a Mass Grave at the Korićani Cliffs in Central Bosnia”, *Journal of Forensic and Legal Medicine*, Vol. 66, 2019.

70 ICTY, *Karadžić*, above note 51, paras 5597–5598; International Residual Mechanism for Criminal Tribunals, *Prosecutor v. Mladić*, Case No. MICT-13-56-A, Judgment (Appeals Chamber), 8 June 2021.

71 See also Melanie Klinkner, “Karadžić’s Guilty Verdict and Forensic Evidence from Bosnia’s Mass Graves”, *Science and Justice*, Vol. 56, No. 6, 2016.

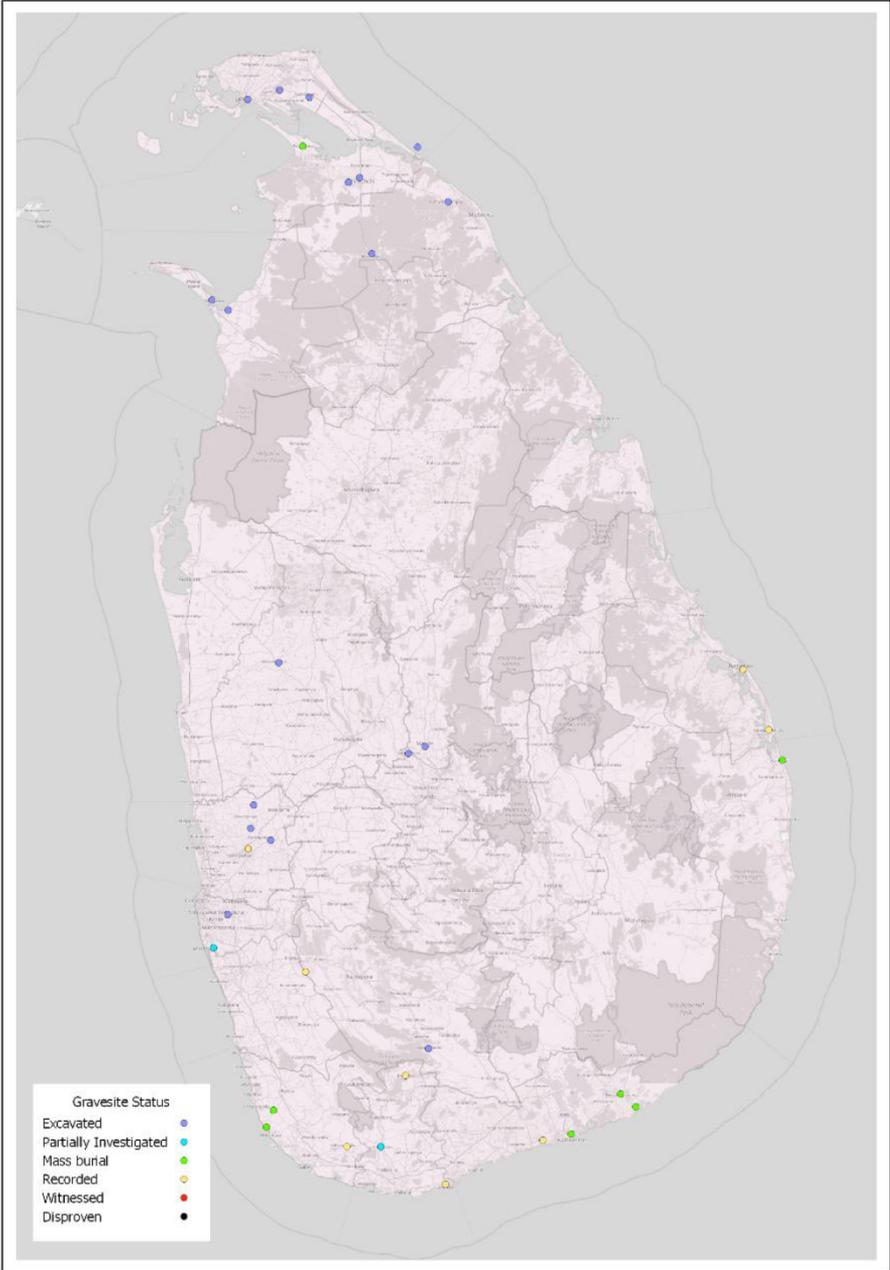


Figure 2. Map of mass graves in Sri Lanka, depicting site location and status only. Source: MaGPIE, 2024.

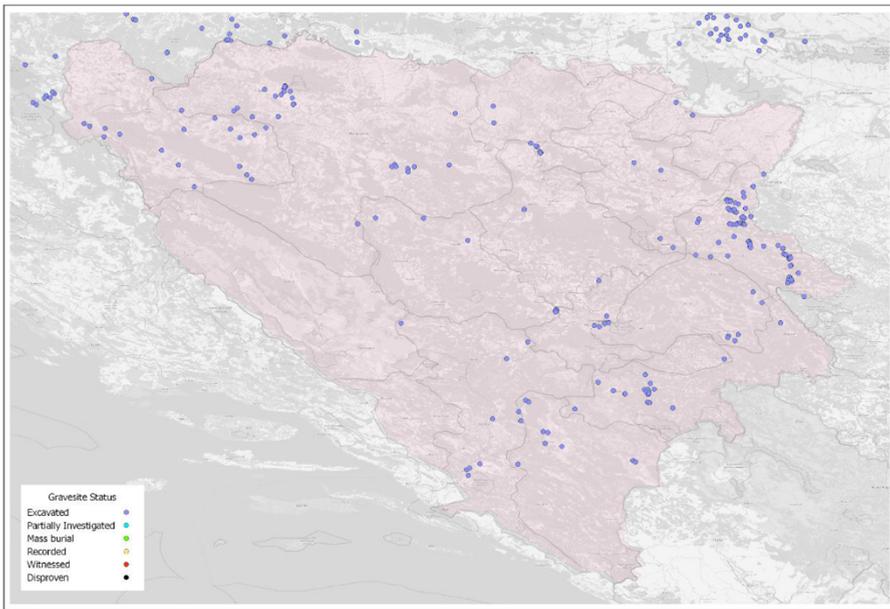


Figure 3. Map of mass graves in Bosnia and Herzegovina depicting site location and status only. Source: MaGPIE, 2024.

buildings such as hospitals, stadiums or military camps, and such concealment further complicates exhumation efforts, or precludes them entirely.⁷² For mapping, this poses challenges in terms of verification of sites and associated facts.

This brings us to the topic of site protection. One particularly concerning finding is that many sites are neglected or unmarked. After the initial investigation, the interest in them is often lost, and there are little to no official commemoration efforts. This neglect stems from different factors associated with the physical location of a site: often, mass graves are in remote or inaccessible sites, while in other cases, they are located on private property or man-made structures, or they are in natural formations such as caves, pits or cliffs. In Bosnia and Herzegovina, sites that seem to predominantly have an associated physical protection are those located in natural formations. When possible, locations like caves or pits are sealed and might be marked with commemorative plaques or monuments. Where State efforts are absent, the burden of protection and commemoration usually falls on families, who engage

72 According to a statement by the Alliance Creative Community Project, interference with mass graves and the hindrance of investigations may serve to avoid or hamper accountability processes. *Written Statement Submitted by Alliance Creative Community Project, a Non-Governmental Organization in Special Consultative Status*, UN Doc A/HRC/54/NGO/42, 11 January 2024. For further analysis on the reasons behind such disturbance, see also Maria Mikellide, Romanos Lyritsas, Nikandros Ioannidis and Iosif Kovras, “Explaining Strategic Disinterment: Forensics and the Reconstruction of the Missing in Cyprus”, *Political Geography*, Vol. 115, 2024.

in diverse forms of remembrance, often in direct conflict with official institutions.⁷³ Notably, our research found a significant lack of readily available information regarding post-investigation processes like site protection, commemoration, and return of remains; it remains unclear whether this information is simply not publicly accessible, is restricted or is completely absent. Allied to such non-protection is the issue of partial and selective protection of the dead, as this can cause division. Whilst such questions are beyond the scope of the MaGPIE mapping project, the data nonetheless invites further exploration of these issues.

Finally, the ongoing nature of developments is worthy of note. Early on in the project, the team determined the importance of continuous real-time mass grave “horizon scanning” – that is, regularly monitoring multiple media and legal sources to ensure that mapping and other projects within the MaGPIE remit are responsive and relevant to ongoing and emerging situations. The results from this activity in Sri Lanka alone during the months of September and October 2024 reveal a range of mass grave-related developments across the country, including the beginning of presumptive identifications of persons within mass graves through material objects found in the graves,⁷⁴ excavations⁷⁵ (and the absence thereof⁷⁶); and instances of restricted media coverage.⁷⁷ Although the credibility of these accounts remains unanalyzed, such reported volatility in Sri Lankan processes warrants continued attention. It is through horizon scanning that the MaGPIE team is alerted to such changes and can monitor them proactively.

Mapping’s propensity for protection

As the exposition and reflection on the pilot project demonstrates, the seeming absence of physical protection arguably amplifies the need for digital ways of recording and preserving information on mass graves. Indeed, there are many other mapping projects that similarly seek to offer digital protection in relation to an array of human rights violations, including those surrounding mass graves. Examples of mass grave maps and recording initiatives include those implemented by the Documentation Centre of Cambodia, the Forensic Anthropology Foundation of Guatemala, Balkan Transitional Justice, the Regional Government of Andalusia,

73 Centre for Nonviolent Action, *War of Memories: Places of Suffering and Remembrance of War in Bosnia-Herzegovina*, Sarajevo-Belgrade, 2016; Thyagi Ruwanpathirana, *Memorialisation for Transitional Justice in Sri Lanka: A Discussion Paper*, Centre for Policy Alternatives, Colombo, March 2016, p. 20.

74 “Details from Skeletons Exhumed Last Year in Kokkuthoduvai to Be Finally Made Public”, *Tamil Guardian*, 27 September 2024, available at: www.tamilguardian.com/content/details-skeletons-exhumed-last-year-kokkuthoduvai-be-finally-made-public.

75 “Total of 8 Bodies Uncovered from Colombo Mass Grave So Far”, *Tamil Guardian*, 7 October 2024, available at: www.tamilguardian.com/content/total-8-bodies-uncovered-colombo-mass-grave-so-far.

76 Lanka Files, “Excavations at Mass Grave in Sri Lanka’s Main Harbour Postponed”, 14 September 2024, available at: <https://lankafiles.medium.com/excavations-at-mass-grave-in-sri-lankas-main-harbour-postponed-d2955fb390e8>.

77 “Excavation of Mannar Mass Grave Resumes Despite Media Restrictions”, *Tamil Guardian*, 10 October 2024, available at: www.tamilguardian.com/content/excavation-mannar-mass-grave-resumes-despite-media-restrictions.

Justiceinfo.net, Yazda and the Syria Justice and Accountability Centre.⁷⁸ Often the goals of these efforts are to advance justice and accountability, preserve testimony and memory, raise awareness and provide monitoring.⁷⁹

We therefore return to the first question posed in this article as it matters beyond MaGPIE's efforts: can digital recording and mapping be a form of protection of the dead? In the sense that it fills a total gap in protection, the answer may well be yes, though dependent on context. Through embracing technologies, digital recording and mapping, mass grave information can be made accessible and easy to share for awareness-raising. The benefits for protection are as follows:

- Digital mapping can highlight gaps and needs for physical and further legal protection. As evidenced by the pilot, it can serve as a precondition for implementing an effective protection regime.
- Protection through verification: by triangulating reports and evidence from multiple sources, accuracy levels in relation to numbers, identity and location of the dead can be increased. At a minimum, verification offers acknowledgment of their existence.
- Protection through highlighting of magnitude: by mapping and documenting mass graves in terms of their scale and the local context in which they are situated, an evidence-based substrate is created from which to highlight the scale of dead bodies that might exist in-country or worldwide, thereby underscoring the need for action and redress.
- Real-time mapping as protection and preparedness for the future: adapting the mass grave mapping model to recording of real-time events can serve as an early archive to inform subsequent investigation, identification and return efforts.
- Finally, a global map fits within the international legal framework and speaks loudly to the rights of victims, including the right to know what happened, both individually and societally.

In many regards, however, the answer to the question of protection benefits depends on the answer to the question of what it is that is assembled in digital form. And herein lies a significant limitation: where a holistic view of the mass grave is taken, multiple epistemological standpoints (religious, cultural, forensic, archaeological, legal, etc.), material forms (human and non-human remains, artefacts, etc.), and social and political expectations converge. Moreover, perspectives and expectations may change at different stages of a mass grave life cycle. In this sense, mass graves can be described as complex assemblages in and of themselves: they have multiple rationalities, as opposed to a singular logic; they are milieus through which wider

78 For an appraisal of mapping projects and their goals, see M. Klinkner, E. Smith and R. Harris, above note 45, pp. 3–7. For further information on approaches in this field, see Sam Dubberley and Gabriela Ivens, *Outlining a Human-Rights Based Approach to Digital Open-Source Investigations: A Guide for Human Rights Organisations and Open-Source Researchers*, Human Rights, Big Data and Technology Project, University of Essex, 2022.

79 M. Klinkner and E. Smith, above note 45.

socio-political relations are negotiated, juxtaposed, etc. Similarly, mapping efforts of mass graves can simultaneously constitute a space of education and commemoration as well as, at worst, a spectacle.⁸⁰ The difficulty arises in re-creating a digital account in light of these complexities, which requires a balance between capturing the fact that every mass grave is different and having a data system that is uniform and thus equitable and comparable across different contexts. In defining data entry points and data fields, associated information that does not fit the categorization format is inevitably sidelined or at risk of being excluded.

Of course, MaGPIE's mass grave mapping effort is inspired by the desire to produce a data assembly that is about more than retrieval, identification and quantification. The anthropological view must be acknowledged; indeed, the archive and material collated that "sit" behind the map will further facilitate such examination. At the same time, we are clear about the global mapping project's limitation of recording verified facts from predominantly English-language sources and an international legal-forensic perspective, albeit with integrity and energy. Over time, there may be avenues to mitigate such shortcomings: capturing information on mass graves need not be a static digital capture but can record changes over time through regular updates and possibly also through the use of artificial intelligence as an additional and repeated verification source.⁸¹

Indeed, our findings confirm valuable insights for ongoing and future investigations by highlighting the utility of integrated data systems:⁸² it is not until data is captured, linked and integrated that further evidential potential is revealed. Returning to the Kozluk example, the vast amount of information available demonstrates the value of careful integration of data points to allow for an evolution of interpretation of criminal evidence, event understanding, and scales of identification over time.

Concluding remarks and the journey ahead

The desire for protection of, and engagement with, the dead is seemingly part of the *conditio humana*, and is to the benefit of the living. International law reflects this, and in places specifically acknowledges it. Since large numbers of dead bodies, whether from natural disasters, armed conflict, human rights violations, terrorism, mass human migration crises or human trafficking, remain uninvestigated, unidentified and often unmarked, this paper suggests that digital mapping of mass graves can contribute to protection by collating, verifying and preserving information around the dead.

In appraising the various lenses (legal, forensic and anthropological) that converge around mass graves, the paper makes the following contribution to theory.

80 Olivera Simic, "Remembering, Visiting and Placing the Dead: Law, Authority and Genocide in Srebrenica", *Law Text Culture*, Vol. 13, 2009, p. 301.

81 The use of artificial intelligence has been suggested to assist in relation to the dead in armed conflict: see E. Madziwa, above note 2.

82 As proffered, for example, by M. Salado Puerto *et al.*, above note 32.

Particularly where physical protection is not forthcoming, (digital) recording may be the only available format for preserving information. Conversely, specifically where narratives are contested and at times silenced, even where mass graves have been investigated, digitally capturing the existence of mass graves can be an important form of preservation in an attempt to avoid effectively “losing” the dead twice – first on disappearance in a mass grave, and second through omission from factual accounts. Precisely because mass graves are so very complex and impactful, untangling the difficult web of information around them may enable us to cut through narratives and tease out the core facts.

Cognizant of the physical protection deficit, the paper’s contribution to practice then lies in outlining a methodologically rigorous approach to capturing the magnitude of mass graves. This, in turn, will help preserve sites of conscience and the bodies they contain, thereby, at a minimum, acknowledging that they exist. The MaGPIE project will continue on this route to producing a global record of mass grave sites and to quantifying the scale of mass graves and their victims worldwide. This will help strengthen the argument that the dead in mass graves should not be ignored, discounted or forgotten.