

Section A: The fields in this section are mandatory.		
Institution: Durham University		
Unit of Assessment: 15 Archaeology		
Title of case study: Training in Action: securing heritage and building resilience after conflict in North Africa		
Period when the underpinning research was undertaken: Between 2007 and 2019		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Anna Leone	Professor	1 December 2004 to present
Marco Nebbia	Postdoctoral Researcher	6 Nov 2012 to 16 July 2019
Period when the claimed impact occurred: Between November 2013 and July 2020		
Is this case study continued from a case study submitted in 2014? N		
Section B		
1. Summary of the impact		
<p>Responding to instability across North Africa since the Arab Spring, Durham University has mobilised research into the iconic ancient cities and rural hinterlands of Libya and Tunisia. Working with local Departments of Antiquities, United Nations Educational Scientific and Cultural Organization (UNESCO) and Interpol, Leone has enabled regional heritage protection agencies to safeguard their vulnerable and neglected post-Roman heritage through: (1) tangible changes to knowledge and skills in more than 70% of heritage professionals in both countries; (2) transformed recording and protection strategies, documenting over 215 new heritage sites and implementing a novel collections management system called HeDAP, and (3) capacity building for the future enabling fresh professional structures and cooperation between Libyan and Tunisian heritage agencies.</p>		
2. Underpinning research		
<p>Since 2007, Anna Leone's pioneering research on the changing townscapes and hinterlands of North Africa has explored the neglected archaeology of urban and rural lifeways in the Late Roman-Vandal-Byzantine-early Islamic North African provinces of Zeugitana, Byzacena, and Tripolitana (modern Tunisia and western Libya). Engaging with a period of exceptional change, characterised by decay, abandonment and transformation, Leone has established the character and chronologies of vulnerable post-Roman, Christian and Islamic archaeology and heritage, focused on key heritage sites including Carthage, Lepcis Magna, Sabratha, Cyrene, Sufetula etc. [R1-Chs 2-4; R2-Chs 2-5]. By recognising the different trajectories of urban and rural change, including organised programmes of dismantling and recycling and an early Islamic investment in urban fabric, Leone presents a nuanced picture of material transformations under varied authorities [R2-Ch4] and reveals a complex material culture record that may well have remained overshadowed by better-known Roman cityscapes.</p> <p>This research expertise positioned Durham University (DU) in the 2010s to respond to evolving threats posed by political unrest, conflict and extremism in North Africa. With funding from <i>National Geographic</i> (USD15,000 2011-2013), Society for Libyan Studies (GBP7,290 2010-2014) and in collaboration with the Deutsches Archäologisches Institut (Rome Department) (EUR50,000 2008-2014), the first phase of the project (<i>From Africa to Ifriqiya</i> 2014-16) was developed alongside the Departments of Antiquities (DoAs) in Libya (currently split into East and West with separate Directors). Leone worked with Marco Nebbia, a post-doctoral research assistant at DU, to design and deliver a structured training pathway. This comprised a series of intensive Continuing Professional Development courses, delivered in Sfax (Tunisia), for Libyan, and later Tunisian heritage professionals. These courses drew on case studies derived from Leone's research, including Lepcis Magna, Sabratha and the Gebel Nāfusa, and introduced the course participants to different ways of documenting, interpreting and protecting vulnerable heritage assets. In particular, the training embedded a new understanding of archaeological sequences and material culture, alongside expertise in heritage recording and protection, such as systematic field survey, photogrammetry, drone work, Global Positioning Systems (GPS), geophysics, assessments of the condition of standing buildings and remains and the use of Geographic Information Systems (GIS). Trainees were able to apply their learning to their territories with guidance and support from</p>		

Leone and Nebbia, and then co-publish the research results. For example, driven by the constant political threat to sites in Ifriqiya, Leone, Nebbia and the trainees worked to ‘*track the transition from the Byzantine into the Arab period*’ in the Gebel Nāfusa region, analysing data and co-publishing ‘*a shared protocol for site recording and management within the territory*’ [R3, p.973].

Between April 2017 and Nov 2019 major grant-funding from the British Council (GBP956,135 4-2017) facilitated a more expansive pathway. *Training in Action* was extended to Libyan and Tunisian heritage and police officials connected to site protection. Again, drawing materially on Leone’s research [R1-Chs 2-3, R2-Chs 4-5] and collaborating with the DoA in Libya, the Institut National du Patrimoine de Tunisie (INP), academic partners at University College and King’s College London, and officials trained on the programme, the team further developed their integrated processes for recording, monitoring and managing heritage at risk. Together they advanced research and methods on multiple projects across sites and landscapes, co-publishing a new integrated methodology [R4]. This new phase of *Training in Action* developed the ‘*values-based system for the recording and management of cultural heritage with high levels of significance*’ developed initially by Leone and Nebbia [R4, p.143] with an advanced approach enabling trainees to build ‘*knowledge in steps...using data collected in the field...Results were then elaborated during focused training [supporting]...the successful development of a group of skilled archaeologists...*’ [R4, p. 143].

Leone’s research on vulnerable portable material culture, in particular the architecture, statuary, spolia, portable antiquities and the complex archaeological sequences that characterise the post-Roman transformations of these regions [R1-Chs 2-3, R2-Chs 4-5] also enabled her to recognise and respond to a need for careful documentation of objects to prevent their illicit trade [R4]. Working first with Interpol and International Council of Museums (ICOM) on the tracing of stolen statues from Cyrene now entering the European art market, Leone developed HeDAP (Heritage Documentation And Protection), an application that offers a new pathway to heritage protection. This impact tool is a collection management system that can catalogue, organise, manage and track archaeological remains *in situ* as well as portable objects in museum collections [R4]. It was designed in a research collaboration with Durham University Advanced Research Computing (ARC), the DoAs and course participants and built using a Linux system for Android with ARC and UK commercial archaeology enterprise L-P Archaeology. Durham postgraduates were instrumental in its development, both in terms of its initial construction (Brennan, PhD, Computer Science, 2016-2019) and the development of an image recognition system which achieves accuracy in 98% of cases (Roberts, MRes, Archaeology and Computer Science, 2018-2019). The system is both easy to operate, fast and links to Interpol for stolen objects.

3. References to the research

[R1] Leone A. 2007. *Changing Townscapes in North Africa from Late Antiquity to the Arab Conquest*. Palilia, Deutsches Archaeologisches Institut. <https://dro.dur.ac.uk/3923/>. Submitted REF2008.

[R2] Leone A. 2013. *The End of the Pagan City*. Oxford University Press. <http://dro.dur.ac.uk/11283/>. Submitted REF 2014.

[R3] Nebbia, N., Leone, A., Bockmann, R., Hddad, M., Abdouli, H., Masoud, A. M., Elkendi, N., Hamoud, H., Adam, S. & Khatab, M. 2016. Developing a collaborative strategy to manage and preserve cultural heritage during the Libyan conflict. The case of the Gebel Nāfusa, *Journal of Archaeological Method and Theory* 23(4): 971-88. <https://doi.org/10.1007/s10816-016-9299-6> Submitted REF2021.

[R4] Leone, A., Wootton, W., Alkhalaf, H., Nebbia, M., Voke, P., Othman, A., Saad, A., Siala, Z. & Belzic M. 2020. An integrated methodology for the documentation and protection of cultural heritage in the MENA region: a case study from Libya and Tunisia, *Libyan Studies* 51: 1-24. <https://doi.org/10.1017/lis.2020.11>. Internally rated 2*

4. Details of the impact

Training in Action (2014-2019) embeds DU research in Libya and Tunisia through a distinctive structured training pathway. Heritage professionals and police agents work in partnership with the Durham team on new data they have harvested in their professional roles 'on the ground', developing a range of analytical and management methods relevant to the heritage in their care, publishing their results together and developing new integrated protection protocols and methods. Impact is claimed in (1) the advancement of knowledge and skills, (2) changes to recording and protection strategies and (3) increased reach in the establishment of new professional structures and cooperation:

1. Developing the knowledge and skills of heritage professionals in North Africa

Training in Action embraces all Departments of Antiquities and has empowered 74 officials in Libya and Tunisia to record and protect the vulnerable heritage assets in their care. Training using post-Roman datasets and sites, for example at Iunca, Tunisia, has resulted in the upskilling of 70 heritage professionals (representing c. 70% of all professionals actively employed in archaeology in both countries) and four police officials currently in post [E1-Sheet 1(p.4)-Overall Training]. 93% of participants (69 in total) state that the knowledge and skills gained has advanced their understanding of the heritage under their care [E1-Sheet 1(p.4)-Feedback all training] and the training is considered to have had “*significant value and impact... [which] advanced and positively changed the knowledge and skills of staff members*” [E7-DoA Libya West].



Figure 1. Locations of the sites and monuments recorded and protected by *Training in Action* mini-projects.

To ensure that the project secured substance and consequence in the long term, 35 of the 74 trainees were upskilled in 2017-19 to an advanced level. The 35 learners chose mini-projects

from their regions of authority [E2], and all believe that they now have an enhanced understanding of approaches to heritage overall [E1-Sheet 2(p.5)-Adv. class feedback-heritage management columns]. They identify new efficiencies in cultural heritage protection methods [E1-Sheet 2(p.5)-Adv. class feedback-Masoud] as well as highlighting their increased confidence in undertaking tasks independently, for example the co-ordination of a new, much-needed scheme of common terminologies for use by the DoAs in Libya East and West and Tunisia with HeDAP [E1-Sheet 2(p.5)-Adv. class feedback-Atelawi]. Side-by-side training of officials from both countries not only intensified the training experience but also encouraged strong bilateral cooperation. Hajar Krimi, INP Inspector el Djem, testifies: “*the most interesting aspect in this course is the growth of the team and the collaboration between Tunisian and Libyan archaeologists...it will develop very effective protection methods for the archaeological heritage, on the one hand, and it will establish further cooperation between the two countries, on the other*” - [E1-Sheet 2(p.6)-Adv. class feedback-Krimi]. DU training even stimulated collaborative educational initiatives: at the sites of El Djem and Lepcis Magna, Libyan and Tunisian heritage officers developed joint activities for International Museum Day 2018 enabling children to gain an experience of museum work [E3, 12:30-13:07- Atelawi].

2. Transforming recording and protection processes

Deploying their new knowledge and skills, the advanced trainees were materially influenced by Leone's research on the post-Roman archaeology of the region [R1,2], developing mini projects which prioritised the recording and protection of monuments and zones in their territories, bringing about significant change in heritage recording and protection measures:

(i) Enhanced site protection: officials have catalogued 198 new post-Roman and early Islamic sites in an area of 200km² in the Gebel Nāfusa, using the systematic recording techniques and knowledge they acquired during their training. All of these sites are now recognised by official agencies and the course participants are actively working with UNESCO to inform the list of World Heritage Sites at Risk in Libya. At Lunca (Tunisia), for example, new discoveries made by heritage officers using geophysics and field survey have generated long-term recommendations for conservation projects which have now been officially endorsed by relevant government agencies [E4-joint management plan for Lunca-DU and INP]. Co-developed trainee-led projects involving field survey have also resulted in the definition of a new buffer zone around Cyrene, now endorsed by a UNESCO report by the DoA [E2 Proj 5-Al Hrari]. At Sabratha, a co-produced evaluation of recent conflict damage and gunfire on monuments (using DU recording forms) resulted in the development of a new collaborative project, funded by Gerda Henkel Patrimonies (EUR26,005 7-2020), which combines DU trainees with specialists at the University of the West of England measuring ballistic damage on stone ahead of restoration measures [E2 Proj 4; E3-video: 4:42 to 5:17; E7]. Significant new protection measures for mapping and assessment of urban threats to heritage have been achieved across both countries, for example the delineation of buffer zones at Qaser Alakyar and Zwara, Tocra, Thyna and Gabés and the creation of standard procedures at work at Carthage for the INP [E2 Projs 3, 6, 13, 14, 16].

(ii) New strategies to protect heritage assets from trade in antiquities: the roll-out of the HeDAP digital application by Leone, drawing on research experience with vulnerable portable material culture [R2-Chs 4-5], has directly involved the DoAs and course participants in using HeDAP to record both post-Roman and early Islamic archaeological remains *in situ* and objects in museum collections and to monitor damage, vandalism, theft and illicit trade. Terminology (standardised in 3 languages) and testing was undertaken as a collaborative exercise before the tool was launched in 2019. HeDAP has now been used to progress a National Museum database for the whole of Libya, documenting a significant proportion of objects in the collections at Tripoli for the West and at Cyrene museum (in modern Shahat) for the East, and now in extended to the Sfax region in Tunisia, with over 10,262 individual assets recorded to date by project trainees [E2 Projs 8, 10, 15, 24, 26, 27, 29; E3-video: 9:07 to 9:30; E7]. Across east Libya, Kufic inscriptions in stone have also been recorded by the DoA using HeDAP after DU support and training facilitated a successful application by heritage officials to the Prince Claus Fund for Cultural Emergency Response (EUR13,000 1-2018). This facilitated recording then transport of the inscriptions to new secure locations, while elsewhere statues at Cyrene are now safeguarded off-site. In short, HeDAP has served as a mechanism to enable action in valuing and preserving heritage. Its importance and implementation is strongly endorsed by the Departments of Antiquities in Libya East and West [E6, E7] and the General Director of the INP Tunisia [E5].

This rapid recording system, its associated catalogues and photographic documentation are now essential to police and international agencies in the prevention of looting. The potential transfer of HeDAP to other parts of the world is highlighted by the European Counter Terrorism Centre who recognise its “*great impact on the fight against the illicit traffic of antiquities*” and advocate its implementation in Iraq [E9] by the Government at the Museum of Baghdad [E10].

3. Capacity building for the future

Training in Action has materially drawn on Leone’s research on urban sites and their hinterlands [R1,2], and on joint work with Nebbia and the trainees [R3], changing knowledge and skills and the working practices of newly trained officials in both Libya and Tunisia [e.g. E2 Projs 2, 6, 12, 13 & 28]. While one enduring impact is the enhanced capacity of individuals in the DoA to implement techniques such as GPS and photogrammetry work, another is through long-term changes in the structure of national heritage protection. Recognition of the vulnerability and importance of post-Roman archaeology [R1,2] and a need to protect sites and landscapes using integrated methods [R3,4], has resulted in the implementation of new

research-based units, namely the creation of a National Office for Geographic Information Systems in Sfax Tunisia, which is now enhancing the management of sites on the ground [E5] and a new Survey Unit in Libya East which is undertaking surface and remote survey and GIS of vulnerable assets [E6]. Materially influenced by Leone's research [R2-Chs 4-5], work with protection agencies and the development of HeDAP [R4], a further impact is the creation of three new Museum Units in Libya and Tunisia which manage artefact collections and co-operate with international agencies to limit illegal trade in antiquities [E5, E6]. *Training in Action* has also led directly to the appointment of advanced level trainees at the Libyan DoAs both East and West, and in Tunisia. Elgumati (Libya East Survey Unit), Bouleigha (Libya East Museum Unit), Azouz (Tunisia GIS Survey Unit) and Hamdi (Tunisia Museum Unit) all lead on these new government agencies [E5, E6 & E7], while the DoA Tripoli (Libya West) reports that "as a direct result of the training project and the development of HeDAP we have created a new unit to manage the database, with the leadership of Faraj Atelawi, who was trained by Durham University and built a team of trained staff, training them" [E7].

Course participants have also extended their new skills to third parties. The trainees, via their mini projects, have rolled out training to an additional 86 employees and officials at their respective heritage agencies and museums [E2 Projs 4, 6, 8, 10, 11, 12, 17, 19, 22, 24, 29, 32, 33]. This includes follow-on training for 15 colleagues in Cyrenaica [E6 & E2 Proj 32] and a new team in Tunisia: "I started by training a local team, made up of nine trainees on sites and museums in the Sfax municipality. Then worked to create a team on a national level [in Djerba, Gasfa, Oudhna, Carthage, Susa]" [E3, 7:04 to 7:59-Hamdi, Institut National du Patrimoine de Tunisie]. In Libya, Mohamed Bouleigha (DoA) catalogued objects in the museum at Shahat and then created "a team that documented objects in almost all the east of Libya, including... Tolmeita (Ptolemais), Tocrá, al-Bayda, Susa (Apollonia), Cyrene, Derna and Al Qubbah" [E3, 8:35 to 9:07]. This cascading of training significantly expands the reach of the project in many different skills [E1-Sheet 2(p.5)-Adv. class feedback-Trabelsi & Naili] e.g. INP-Trabelsi "I have been disseminating this new knowledge and sharing it with my colleagues at INP, both technicians and engineers, by training them in the use of GIS and photogrammetry".

Training also included outreach activities in schools and local communities e.g. Sfax (Tunisia) and Germa (Libya) [E2 Projs 7 & 15] "to work towards engaging them in the decision-making process as part of heritage management" [E3, 2:08-2:20] and to encourage "the local community and decision-makers to work together to preserve and protect archaeological sites" [E1-Adv. class feedback-Abdulafith]. Where once trainees saw threats to heritage they now "view the community as an active partner in the protection of cultural heritage" [E3, 9:31-9:59]. With project support, trainees are working with schools in Fezzan, south-west Libya, and count lectures, site visits and educational leaflets on relevant archaeology among their achievements as well as advising on measures to protect associated heritage assets [E3, 10:00-11:19]. So far, over 200 children in have been involved. This is a valuable 'first' for a badly affected region in the conflict where cultural initiatives have not been prioritised.

5. Sources to corroborate the impact

- E1. Questionnaire feedback from training workshops and letters (April 2014-Dec 2019)
- E2. Spreadsheet of 33 advanced 'mini projects', letters and impacts (April 2017-Dec 2019).
- E3. Video with interviews of trainees (2019)
- E4. Management plan Iunca, by DU, trainees and Institut National du Patrimoine de Tunisie.
- E5. Letter, Faouzi Mahfoudh, General Director Institut National du Patrimoine de Tunisie.
- E6. Letter, Ahmed Hussein, Chairman of DoA Libya - Benghazi.
- E7. Letter, Mohamed Faraj Al Faloos, Chairman Department of Antiquities of Libya.
- E9. Testimonial, EU counter terrorism Unit on importance of HeDAP.
- E10. Letter, Ministry of Culture, Iraq detailing implementation of HeDAP.