

Team work	Partnership	Africa	Scope	Scale
				
CORE TEAM MEMBERS	UNIVERSITIES & HERITAGE INSTITUTIONS	COUNTRIES	SITES	AREA
24	9*	8	11,002*	229,822 km <sup>2</sup> *
Researchers Project Manager Principal Investigator Database Developer Project Co-Investigators	BIEA, Cambridge, Exeter, IFAN-UCAD, NMK, UCL, Uppsala, WITS, York	Zimbabwe, Tanzania Sudan, Senegal, Mali, Kenya, Ethiopia, Botswana	Archaeological sites & monuments registered in Arches database	Land surveyed using Remote Sensing methods
* AND COUNTING! As of December 2021				

### EDITORIAL

#### Welcome

Welcome to the second issue of the MAEASaM newsletter. As 2021 winds down, we can reflect on a year when significant objectives have been met in the face of major challenges caused largely by the global Covid pandemic.

Despite the obstacles, the resiliency, adaptability, and inventiveness of members, collaborators and partners have been clear to see. So far, over 11,000 site records have been digitised in the tailor-made Arches database. This growing repository includes sites from Mali, Senegal, Ethiopia, Sudan, Tanzania, Kenya, Zimbabwe, and Botswana, located through legacy records and remote sensing surveys. Over 229,800 square kilometres have been systematically investigated for potential heritage sites. The team has worked hard to deliver other key milestones. We launched our social media channels and are using these to communicate about the project, celebrate Africa's archaeological sites and monuments and raise awareness of the increasing threats that so many of them face today. We held three joint open access workshops with MAEASaM's sister project, [Mapping Archaeological Heritage in South Asia \(MAHSA\)](#), to exchange knowledge and facilitate workable solutions, the latest being on the use of historical maps in archaeological research (see -

pages 3 and 6 for further details).

While the pandemic has made it more difficult to move forward seamlessly in some areas, the team continues to strengthen collaboration, focused on the shared objective of building a meaningful and unified digital record of in-country African archaeological heritage with African-based heritage institutions. As Tim Berners-Lee, the inventor of the World Wide Web has observed, "[The Web does not just connect machines, it connects people.](#)" It is a reminder of how the digital technologies we are deploying in the project can connect, enhance, and develop human capital: capacity and shared knowledge. There is still much to be done globally however - not least to correct the digital imbalance that is a serious obstacle in lower-resource environments. The MAEASaM project is firmly focused on these social and technical dimensions and shares the ambition with its key heritage stakeholders to enable the long-term sustainability of digital archaeological repositories and tools in Africa.

Collaborations and collective efforts are celebrated in this issue of the newsletter. To illuminate the theme, we are pleased to present two contributions by project collaborators and partners: Dr Emmanuel Ndiema, Head of the Department of

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### SNEAK PEEK

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Meet Susan Akinyi Ongoro of NMK.

Earth Sciences at the National Museums of Kenya (NMK) and Professor Ibrahima Thiaw, who directs the Archaeological Laboratory at IFAN, University of Cheikh Anta Diop (IFAN-UCAD) in Dakar, Senegal. Both articles offer unique insights into the nature of their respective national archaeological archives, and the role of digital and spatial technologies in the documentation and conservation of archaeological sites and monuments.

Paul Lane

Principal Investigator, MAEASaM

Jennifer Ward Oppenheimer Professor of the Deep History & Archaeology of Africa, Archaeology Department, University of Cambridge

Stefania Merlo

Project Manager, MAEASaM

McDonald Institute for Archaeological Research, University of Cambridge

Faye Lander

Regional Project Manager, MAEASaM

Origins Centre, Wits University

Below: A carved wooden door at Lamu Old Town, Kenya. Photo taken by Stefania Merlo, 2007.



## REFLECTIONS ON DIGITAL HERITAGE: AN INTERVIEW WITH DR EMMANUEL NDIEMA, HEAD OF EARTH SCIENCES AT THE NATIONAL MUSEUMS OF KENYA (NMK)

We asked Dr Ndiema, Head of the Department of Earth Sciences at the National Museums of Kenya and a key collaborator in the MAEASaM project, for his thoughts on the benefits of digitising the rich and diverse archaeological record of Kenya and what it means not only to heritage managers and academics but to local heritage stakeholders and broader Kenyan society. Dr Ndiema draws on his past and current experiences in Kenyan heritage and offers a unique perspective on how going digital can transform the way populations engage with museums across Africa.

Q: In your opinion, what are the benefits of going digital with an archive?

Digitisation has been a growing trend that has changed how researchers and the public interact with museum collections and how we experience museums. We have had several digitisation initiatives in the recent past with only a small part of the Archaeology and Palaeontology collection and documentation covered. We realised that the institution does not have unified data formats, and that there was a need to integrate all kinds of data from different Departments for better access. The challenge was and still is the required hardware, software, and enough internet bandwidth to handle the traffic.

Q: How do you envisage sustainable digital heritage in Kenya?

The world is going digital - we have no choice but to get on the ship. Where in the past everything was written down on paper, making records digital ensures that they are accessible to many people at the same time. Retrieval of data becomes easier, and in case of a fire, we do not lose all our records. But for it to be sustainable, our staff need to be thoroughly trained so that work will go on long after the MAEASaM project ends. The use of Remote Sensing is very useful with geographic data, and we know that there are many kinds of analysis that can be done with GIS. We have also realised that there are many types of free GIS software that are easily available for this kind of work, so we do not have to worry about cost.

Q: In the current debate on decolonisation and the processes involved, do you think digital archaeology will help?

The new methods of analysis of geographical data may help us to look at old problems from a different angle and may help us to rewrite some of the facts about African history that had largely been written by early European travellers. Retelling the stories our own way, using new methods of analysis that show what the naked eye cannot see, will mean a lot to our history.

// Digitisation helps to break barriers. It has the capacity to make works more visible to African scholars and increase awareness to those sites that were not quite known. //

— Dr Emmanuel Ndiema

Contribution by:

Angela Kabiru, MAEASaM Researcher for Kenya, BIEA, Nairobi.

Emmanuel Ndiema, Head of Department of Earth Sciences at the National Museums of Kenya (NMK), Nairobi.

Jane Humphris, MAEASaM Project Co-Investigator for Kenya and Sudan and Director of the BIEA, UK.

## A NOTE ON THE NATIONAL MUSEUMS OF KENYA (NMK)

The National Museums of Kenya is the sole body mandated with managing Kenya's rich archaeological resources. The museum in its present location in Nairobi was opened in 1930 and named after the former Kenya colony governor Sir Robert Coryndon. After independence in 1963 the building was renamed the National Museums of Kenya and has become a renowned research centre in both natural and cultural sciences. The Department of Earth Sciences now holds one of the largest collections in the world for archaeological and palaeo-anthropological remains related to human evolution.

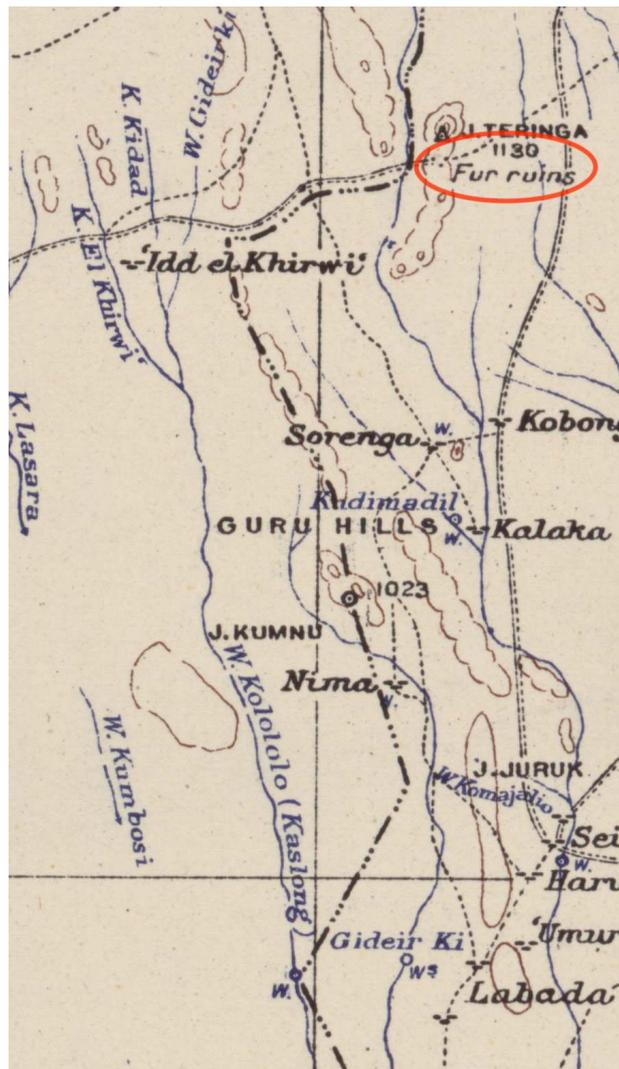


Above: Entrance to the National Museums of Kenya, Nairobi. Photo taken by Angela Kabiru, 2021.

## HISTORICAL MAPS: A POWERFUL TOOL FOR THE DIGITISATION OF THE PAST

As a valuable resource for studying and understanding the past, historical maps can provide important information that might otherwise not be available to us, but they can also present some challenges in their use and interpretation. MAEASaM researchers, Renier van der Merwe and Ed Burnett bring to light this largely under-represented but powerful tool for the documentation of Africa's archaeology in the MAEASaM project.

As the second largest continent, Africa's history is as diverse and dynamic as its present. With a deep history stretching from the hominin footprints at Laetoli, Tanzania to the pyramids of Giza and the monumental architecture of Great Zimbabwe, reconstructing such deep and diverse archaeological landscapes requires multiple techniques, methods, and lines of enquiry. Currently, Africanist archaeologists are using remote sensing techniques to reconstruct past landscapes, such as ground penetrating radar, satellite imagery, and light-based detection methods, commonly known as LiDAR. These techniques are revolutionising our understanding of past landscapes;



Above: Excerpt of the Nyala region of Darfur dated to 1944, 1:250,000 Series, Sheet 54M. - Library of Congress, available at <https://www.loc.gov/resource/g8310m.gct00289/?sp=212>

however, another powerful yet largely under-represented tool is to be found in Africa's historical maps.

A brief review of the literature reveals the extent to which maps have been part of our global human story. From the oldest surviving map – the Imago Mundi or the Babylonian Map – dating to around 600 BCE, to the most detailed global mapping apps such as Google Earth Street View and Google Maps that help billions of humans navigate their daily movements today, it is no surprise that maps have been hailed as 'humankind's greatest tool'.

Historical maps offer a unique perspective at this juncture. They have aided archaeologists in locating ancient settlements that may not be visible to us in the 21st century. One of the many unique qualities of Africa's archaeology is that the largest constituent of her sites is of non-monumental character making it challenging even for the most robust remote sensing technologies to pick them up on the landscape. This means that archaeologists must find different means to discover and document these kinds of sites for future generations.

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## Biases and challenges

Made within the last ~200 years, historical maps can be surprisingly accurate, and can reveal information about present and past landscape changes and the societies that inhabited them. Instead of losing their value the older they become, historical maps are transformed from the current realities of their time to a document that can help reveal missing pieces of the past.

A caveat is that many historical maps are biased. The inherent contradiction of these sources of information is that while they were commonly produced and used in colonial endeavours (this part of their history should not be ignored and should be treated with utmost caution) they can also provide valuable information about regions which have been systematically understudied today. In Sudan, for example, archaeological investigations have tended to focus on the Nile Valley. This unevenness is perhaps a result of antiquarian assumptions of a one-way Egyptian influence, and the more obviously “charismatic” nature of many Nile Valley heritage sites (Meskell 2018). Darfur, on the other hand, has been chronically understudied and this has been due to such biases in conjunction with a long history of conflict in this vast region (Musa Mohamed 1986; Chlebowski and Drzewiecki 2019). The gaps however are starting to be filled. Currently, Ed Burnett at the University of Cambridge and Renier van der Merwe based at the Origins Centre in South Africa are digitising and georeferencing historical maps to enhance our understanding of the archaeology and history of eastern and southern Africa respectively.

## Working with the data

Working with historical maps is by no means an easy task. The process of using historical maps, once they have been obtained in a digital format, involves three main steps: georeferencing, digitisation, and verification. Georeferencing means warping the digital historical map image into an understandable format for a GIS program, digitisation involves the plotting of points (archaeological sites) of interest into a digital format, and verification means either field-based ground

truthing or the application of enhanced visual satellite imagery for site identification.

## Further information

The team at MAEASaM continue to work closely with African historical maps to try to interpret past landscape uses. To explore further visit: <http://maeasam.org/historical-maps/>

Contribution by:

Ed Burnett, MAEASaM Researcher for Sudan, McDonald Institute for Archaeological Research, University of Cambridge.

Renier van der Merwe, MAEASaM Researcher for Zimbabwe and Botswana, Origins Centre, Wits University.

## 🎯 DIGITISATION AND DEMOCRATISATION OF ARCHAEOLOGICAL KNOWLEDGE: A POINT OF VIEW FROM IFAN-UCAD, SENEGAL

Project Co-Investigator, Professor Ibrahima Thiaw, and MAEASaM's Senegal researchers at our partner institution IFAN, University of Cheikh Anta Diop in Dakar, reflect on the history and future of archaeological research in Senegal and the role of digitisation in opening the dialogue for democratisation of science, archaeological knowledge, and restitution.

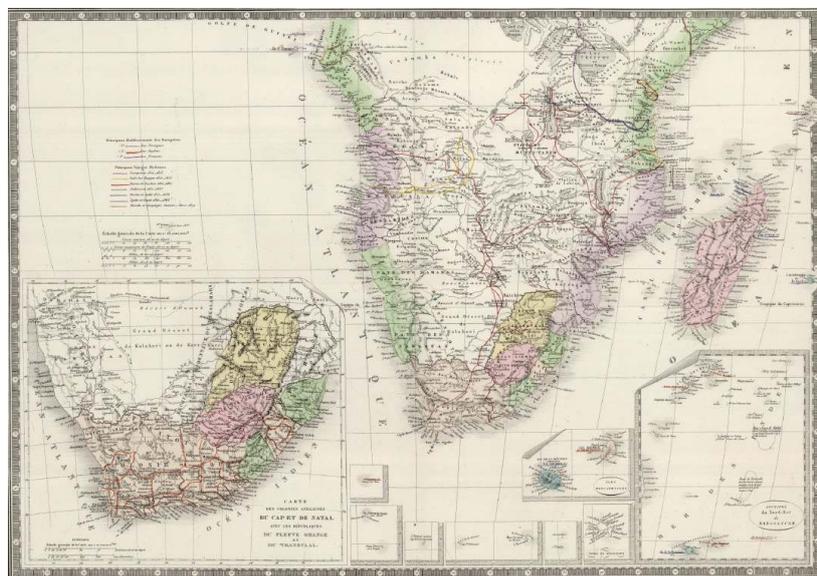
The Institut Fondamental d'Afrique Noire (IFAN) is a pioneer in the field of research in Francophone West Africa. It has had many and diverse collections at its disposal, particularly in archaeology, botany, terrestrial and marine biology, geology, and ethnographic archives, as well as a remarkable network of laboratories and museums across different territories.

The current IFAN is a direct descendant of the Institut Français d'Afrique Noire, which was established in 1936 by the colonial power to provide a well-informed research structure that would serve the purposes of colonial governance. In common with other institutions in Africa, IFAN's immense

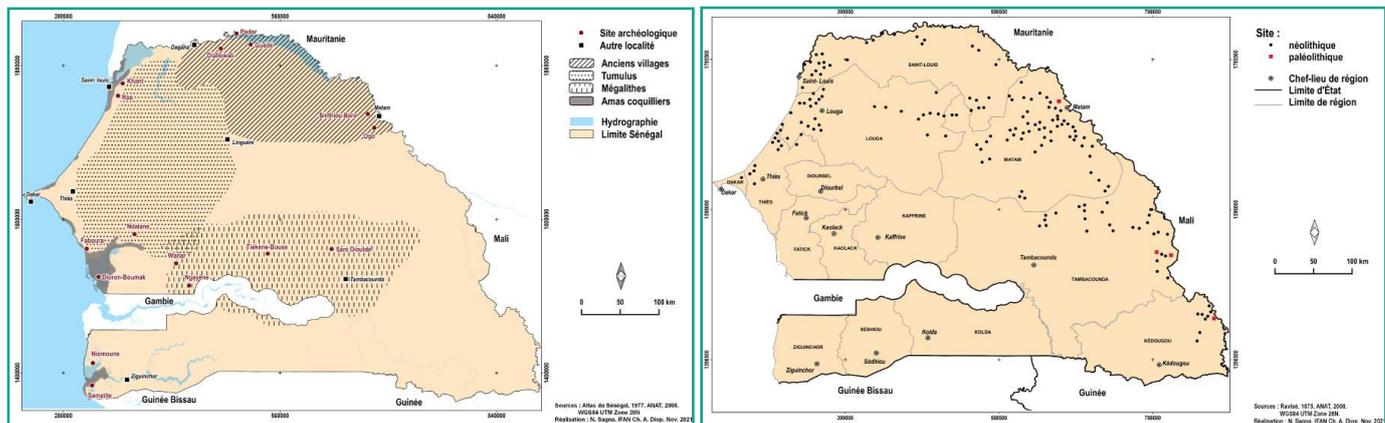
collections of artefacts were acquired in fundamentally problematic and unethical ways that dispossessed African populations of their cultural and natural assets. The colonial scientific legacy is still embedded in contemporary practices, not least in structural problems of research and in the management of sites, monuments, and archaeological collections.

In 1941, IFAN's Archaeology Laboratory was established and brought together important collections that now constitute essential archives, particularly for sites that have disappeared due to urbanisation and other factors. These archives have contributed to the Laboratory becoming a focal point for

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Left: Map of sub-equatorial Africa dated to 1749 (Afrique sud. - David Rumsey Historical Map Collection)



Above: Map of the protohistoric provinces of Senegal (Source: Atlas du Sénégal 1977) and map illustrating the inventory of Neolithic and Palaeolithic sites in Senegal (Source: Ravisé 1975). Maps produced by Mamadou Thior, 2021.

research and conservation, nationally and internationally. In addition, the past two decades have seen Senegalese national inventories and archaeological excavations multiply greatly, leading to a very rapid renewal of collections. With the flowering of new universities across the country during this period, the needs for access to archaeological collections and archives have increased, adding to the already very strong demands. Despite the real advantages, these developments have posed serious problems not only in the management of storage spaces, but also in conservation.

Digitisation offers the opportunity to renew methods of inventory, management, and conservation of archaeological resources. The first such initiatives began in the 2000s with the digitisation of record book collections and some archives. Since 2017, these efforts have been accompanied by the renovation and reorganisation of conservation areas and the acquisition and installation of new storage equipment. In addition, the permanent exhibition in the Laboratory has been redesigned in an educational format that is more accessible to school audiences. It is in this context that the implementation of the MAEASaM project at IFAN takes place.

Through remote sensing and geographic information systems, the MAEASaM project seeks to identify and map endangered sites and monuments, and thereby contribute to monitoring and conservation efforts. This innovative approach, backed by remote sensing,

geomatics, and digital technologies, will allow for the standardisation of protocols used to record and monitor archaeological sites, also making it possible to update the archaeological map of Senegal as an efficient tool for site monitoring and conservation.

The logical continuation of this process would be digital repatriation, which is a much desired and important step towards the effective restitution of collections. Overall, this could undoubtedly help in harmonising the management of archaeological heritage with development policies and resource governance in concerned territories.

When backed by sustained community engagement and enabled by innovative technologies, these paradigm shifts in research, conservation and management practices could offer new perspectives and possibilities that provide credible and sustainable answers to questions of restitution, access, and democratisation. That is what the Archaeology Laboratory at IFAN Cheikh Anta Diop is doing with determination, in a spirit of more equitable sharing and solidarity.

Contribution by:  
Professor Ibrahim Thiaw, MAEASaM Project Co-Investigator for Senegal, IFAN-UCAD, Dakar.

Adama Athie, Nicolas Sagna, Mamadou Thior, MAEASaM Researchers for Senegal, IFAN-UCAD, Dakar.

Demba Kébé, Researcher at IFAN-UCAD, Dakar.



Above: Village of Andiel Bassari and cultural landscape, southeast Senegal. Photo taken by Ibrahim Thiaw.

## WHO'S WHO

Meet Susan Akinyi Ongoro, a Research Assistant and Geographic Information Systems (GIS) technician at the National Museums of Kenya (NMK).

Susan is currently engaged as an archival assistant for the MAEASaM project where she is helping facilitate the retrieval of Kenyan archival archaeological site records housed at NMK and preparing them for entry into MAEASaM's Arches database. Susan holds a Bachelor's degree in Geography and is now enrolled for a Master's degree in Geographic Information Systems at the University of Nairobi. Besides spending much of her time in the NMK archaeological archives, Susan has an enduring passion for landscape analysis using the freely available software, QGIS.



## STAY IN TOUCH!

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Contributions and suggestions for future issues should be sent to [MAEASaM-info@arch.cam.ac.uk](mailto:MAEASaM-info@arch.cam.ac.uk).

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## REPORT

### Arches open community forum and user group meeting, 12 November 2021

MAEASaM was among a group of heritage conservation mapping projects supported by [Arcadia](#) (a charitable fund of Lisbet Rausing and Peter Baldwin) that gathered on a shared virtual platform with the [Getty Conservation Institute](#) and [Farallon Geographics](#) in November. Farallon, who manage Arches, demonstrated their current work on internationalisation, which will be coming soon through version 7. This signals an important moment in the recognition of the multiple languages spoken across the world – with the aim to improve on the overall usability, searchability, and reachability of Arches by heritage stakeholders, researchers, and the public alike.

The meeting was chaired by Dr Cameron Petrie from the University of Cambridge and Principal Investigator of the MAHSA project. The meeting was likely to have been one of the largest gatherings of Arcadia-funded projects:

[Central Asian Archaeological Landscapes \(CAAL\)](#)  
[Endangered Wooden Architecture Programme \(EWAP\)](#)  
[Endangered Archaeology of the Middle East and North Africa \(EAMENA\)](#)  
[Inventory of Maritime Archaeology in Pakistan \(IMAP\)](#)  
[Mapping Africa's Endangered Archaeological Sites and Monuments \(MAEASaM\)](#)  
[Mapping Archaeological Heritage in South Asia \(MAHSA\)](#)  
[Maritime Asia Heritage Survey \(MAHS\)](#)  
[Maritime Endangered Archaeology in the Middle East and North Africa \(MarEA\)](#)  
[Mongolian Archaeology Project \(MAPSS\)](#)  
[Nepal Heritage Documentation Project \(NHDP\)](#)

## HIGHLIGHT

### MAEASaM-MAHSA workshop on the uses of historical maps, 18 October 2021

The MAEASaM project, in conjunction with Mapping Archaeological Heritage of South Asia (MAHSA) hosted an open workshop on the challenges, possibilities, and uses of historical maps for the identification, digitisation, and conservation of archaeological and historical sites across Africa and South Asia. The session brought together over 135 participants from 24 countries including experts from the fields of archaeology, geoinformatics, heritage management, and machine learning. Presentations outlined the complexities of identifying sites from historical based records and how to navigate some of the challenges these records pose when documenting sites. Exploration of the use of historical maps in machine learning for site detection was also discussed, bringing to the forefront technological capabilities that might advance the use of historical maps in the 21st century.

The workshop recording is available on YouTube:

<https://www.youtube.com/watch?v=vvVRHglc4IE&t=367s>

For further resources visit our website: <http://maeasam.org/resources/>



**MAEASaM**

Mapping Africa's Endangered  
Archaeological Sites  
and Monuments

