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Unearthing archival climate change baseline data in southern and eastern Africa

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Abstract

This paper proposes that archives can play an important role in historical climatological research. Major projects in Europe, such as CLIWOC, examine ship logbooks from the era of sail. These sources provide critical weather-related data from the era before scientific climatological measurements and surveys after World War I. Ship logbooks have proved to be crucial sources that have been identified and digitised in major projects such as the CLIWOC project. While CLIWOC has concentrated on the ships concerned of the European maritime powers, their information is of worldwide relevance. This paper then looks at the research that has been undertaken in South Africa and at the sources that have been uncovered by local scientists. The paper also suggests further potential sources within South Africa. Thereafter, the potential sources within the ESARBICA region are suggested with a focus on the African Great Lakes. Finally, an ESARBICA-wide project similar to the CLIWOC and TANAP projects is suggested, and it is proposed that ESARBICA approach IORA for endorsement and funding.

Key words: Archives, African Great Lakes, climate change, eastern and southern Africa, historical climatology, logbooks

Introduction

The existential crisis currently facing humanity on earth is that of climate change. Much scientific and intellectual attention is given to addressing this looming challenge. Wide-scale scientific measurements of climatic and weather-related phenomena began in the mid-Twentieth Century. The World Meteorological Organization, a specialised agency of the United Nations, was established at an international conference in 1947 and began formally in 1950 (WMO website).

However, mariners and farmers have been taking reliable weather measurements for centuries. Archives can play a significant role in supporting climate scientists who are seeking data from the periods before the development of global meteorological scientific research. A key record type in this regard is ship logbooks. Ship logbooks are the record of a voyage: they describe events, observations, incidents and weather conditions, usually on a daily or even more frequent basis. Their scientific value is because, in an era before science education was formalised, mariners were among the best-trained and experienced observers of natural phenomena, and their success and safety depended largely on their accurate and regular recording of such phenomena.

Important research projects have been conducted in Europe and elsewhere in the developed world based on maritime archival sources. The most important being the Climatological database for the world's oceans (CLIWOC) project. South Africa played a major role in the Dutch-managed Trans-Anatolian Natural Gas Pipeline (TANAP) project that digitised records of the Dutch East India Company (the VOC). This paper examines scientific research into historical climatology that is currently being undertaken in South Africa. It further explores where suitable records may be located (either in national archives or other institutions) in member states in the ESARBICA region and around the Indian Ocean in Indian Ocean Rim Association (IORA) member states. The paper concludes with a proposal for a region-wide collaborative project with the potential to reach far wider and broader audiences than at present.

The purpose of this paper is to sensitize archivists in the ESARBICA region to potential sources relevant to the production of climatological and weather-related metadata from the period preceding the widespread scientific gathering of such information in the post-World War II era.

This article follows earlier work I published on the issue focusing more broadly on the Indian Ocean region (Dominy 2021). This work was partly stimulated by a reading of Taylor (2007), which is a dramatic account of the Anglo-French battles for control of the island of Mauritius in 1809 and 1810. Taylor undertook thorough archival research, relying on the accounts in the logbooks of the ships of the British East India Company (BEIC) kept in the British Library. This led to my discovery of the CLIWOC project.

A further stimulus for my research was my attendance of the Indian Ocean *Imbizo* held at the Nelson Mandela University, Port Elizabeth (now Gqebera) in September 2017 and presenting of a paper suggesting that climate scientists should take note of the data to be derived from a study of ship logbooks. The colloquium was an inter-disciplinary gathering intended to set an agenda for collaborative scientific research in and around the Indian Ocean and its littoral countries. This was expressed in the colloquium's vision of an Indian Ocean Deep Origins Project that was working towards a long-term programme aimed at building an Indian Ocean consortium focused on system studies linking life to the power of tectonics and climate change (NMU Indian Ocean Imbizo 2017).

The colloquium was well timed, as it provided academic support for South Africa's national objectives for the period when South Africa was scheduled to act as chair of the IORA, that is, for the years 2017 to 2019. The Institute for Strategic Studies (ISS) in Pretoria held a seminar a month later, on 30 October 2017, to mark South Africa's assumption of the leadership of the IORA. This operated under the slogan, 'South Africa navigates its new role as IORA head' and the participants focused more on strategic and political issues, than on scientific matters (ISS 2017). The challenge of climate change was not central to the debate on this occasion.

Contextualisation

Traditionally, historians and other academics have predominated among users of archives, as indicated by engagements with the Minister of Arts and Culture of South Africa during the 2010s (Archival Platform 2015, 128). This pattern is reasonably well spread across the ESARBICA region. However, all archives have shown great commitment to broadening their audiences through outreach programmes. While climate change researchers are largely academics and thus do not represent a broader user demographic, they do represent a new segment of the academy that had not previously engaged with archives.

Historical climatology is defined as an interdisciplinary field of research encompassing both the reconstruction of past climate and weather from 'archives of societies' (written sources and artefacts) and the application of climate reconstructions to the study of human history (White et al. 2022). This paper discusses the need to identify the archives of societies in the ESARBICA region that have a bearing on climate change research.

The earliest known written weather records were engraved on ox bones during the Shang dynasty in China (12th to 18th centuries BCE), but these were isolated and sporadic (Grab & Williams 2022). One of the major challenges for climate change research is locating reliable weather-related baseline data for the decades and centuries predating the development of scientific meteorological data collection in the mid-20th century. This is necessary so that climate change scientists can obtain reliable, systematically collected information from the earliest possible times to develop ancient and accurate baseline data. This is then used as a resource from which to extrapolate more reliable predictions of future climate change developments.

Degroot (2018) demonstrated the critical and causal links between climate change during the period 1560 and 1720 and the economic, social and military developments in the growth and contraction of Dutch power and influence. He explored this through Dutch commerce, conflict and culture, ranging from northern Europe and across the globe, carried by the adventurous and enterprising but aggressive Dutch sailing fleets. The logbooks of the sailing ships were among Degroot's most important sources.

The logbooks of sailing ships have been described as priceless sources for graphing and mapping past climate changes, particularly as they unfolded at sea (Wilkinson 2012). As Taylor (2007) stated (see above), mariners needed to keep constant track of the wind; therefore, most ship logbooks contain reliable, detailed and often unbroken weather observations that were entered with every change of wind.

Much work has been done in Europe utilising the records left by the early global shipping conglomerates such as the DEIC (or VOC), the BEIC and their French, Spanish and other counterparts. While the records may be kept in London, Amsterdam or Seville, their contents are global in reach.

However, maritime, or waterborne, activities generating records have occurred extensively within the ESARBICA region. Commercial cattle farming, crop cultivation and plantation agriculture were also widespread across the region and many farmers kept detailed weather records.

Problem statement

With the global challenge of climate change, the urgent questions the current generation needs to ask and answer differ significantly from those asked by earlier generations. This has a major impact on the development and use of archival collections. In the context of climate change research, the current challenge is to identify and make available the archival sources that contain recorded climatological information from the decades, or centuries, from before what are currently understood to be scientific measurements. Extracting the information also requires interpretation and archaic language and measurements need to be rendered into modern terminology (Wilkinson 2012).

The information extracted by these methods from documentary sources has been described as a valuable type of proxy data for establishing past weather and climate, particularly for times before instrumental (quantitative) data became available for a given region (Grab 2023).

Purpose and objectives

Historical climatology is defined as an interdisciplinary field of research encompassing the reconstruction of past climate and weather from "archives of societies" (written sources and artefacts) and the application of climate reconstructions to the study of human history (White et al. 2022). As stated above, considerable research has been done on the archives of climate change available in European (and to a lesser extent American and Australian) archives, but it is only over the last few years that Africa and some Asian areas have received some attention (White et al. 2022). This poses significant challenges and opportunities for the archival profession in Africa.

This is highlighted by the fact that the last major comprehensive report on the state of the archives in South Africa, based on research completed in 2014, makes no mention of the urgent need to broaden the focus of archival research and collection to include records revealing evidence on climate change (Archival Platform 2015). Although it is described as a trans-disciplinary research initiative exploring the conjunction of archives and public life, it focuses more on institutional criticism and offers socio-political suggestions rather than revealing any insight into refocusing archives for facing future societal challenges.

The purpose of this paper is to raise awareness within the ESARBICA archival community about the importance of archival sources relating to weather phenomena and climatological change. The proper archiving of such sources has significant potential for developing an extended user base for regional archives and for making these archives available to wider audiences than the current genealogically, historically and politically orientated users.

The objectives are:

- Outline the broad issues related to archives and climate change.
- Provide a background to the CLIWOC and TANAP projects.
- Discuss climate change research in South Africa using archival sources.
- Suggest further potential sources within South African archives.
- Provide indications as to where weather/climate-related sources may be located within collections in archives or other organisations in the ESARBICA region.
- Outline a potential joint project for ESARBICA.

Research methodology

In this paper, the qualitative research methodology as defined by Ngulube (2015) was followed. Data and information have been gathered from both archival and published sources. However, it is important to note that the proposed project outlined in this paper would generate data to enable climate scientists to conduct future quantitative research. Therefore, mixed methods research might be the most applicable for future research in this field.

Online and hard copy catalogues and registers of archival series in various South African repositories, including National Archives and Records Service of South Africa (NARSSA) and the provincial archives in KwaZulu-Natal and the Western Cape, were consulted to assist with the identification of local sources. Hard copy published and online sources were consulted to identify likely climatological data sources within the ESARBICA region. Consultations have been held with current and previous

staff at the NARSSA. Discussions were also held with archivists from various archival institutions in the region at the 2023 ESARBICA conference.

Literature review

The last comprehensive report on the state of the archives in South Africa, based on research completed in 2014, makes no mention of the urgent need to broaden the focus of archival research and collection development to include records revealing evidence on climate change (Archival Platform 2015). Although this report is described as a transdisciplinary research initiative exploring the conjunction of archives and public life, it focuses more on institutional criticism and offers socio-political suggestions rather than revealing any insight into refocusing archives for facing future societal challenges. However, the fact that it does not offer any insight into the importance of archives in the climate change debate illustrates just how marginalised this issue has been in our region in knowledge management circles before serious attention was paid to the climate crisis.

However, the broad records management policy framework developed by NARSSA does allow for the identification of climatological records as records of enduring value, under certain defined circumstances. The NARSSA Appraisal Policy states that attempting to anticipate future research trends is an 'exercise in futility' (2002:2). This document broadly states the principles of macro-appraisal as it was intended to apply them at NARSSA, 'Archival value, then, in the first instance is located not in records but in the processes which underlie their creation.' (NARSSA 2002:6).

The appraisal of processes operates at four levels (NARSSA 2002:6):

- The broader societal and governmental processes which shape the operations of the government office being appraised. Here the archivist attempts to determine the importance of the office in its broadest context.
- The governmental body's functions and structures. The analysis at this level attempts to assess the relative importance of internal branches and divisions. Branches/divisions with archival potential are targeted.
- Targeted branches/divisions are analysed in terms of their functions and structures. At this level, the archivist attempts to identify the records systems with archival potential.
- Records systems. The goal here is to identify systems with the richest archival potential.

In terms of these guidelines, records containing climatological and weather-related data would be identified as having enduring value within offices and agencies having line function responsibility for the production and analysis of the data to be derived from such records. While this may give us some confidence in terms of the protection of current and future records, it does not assist with historic records. This problem is not unique to South Africa.

Considerable research has been done on the archives of climate change available in European (and to a lesser extent American and Australian) archives, but it is only over the last few years that Africa and some Asian areas have received some attention (White et al. 2022). This poses significant challenges and opportunities for the archival profession in Africa.

According to Wilkinson (2012), British Logbooks in UK Archives 17th to 19th centuries were the main source for the analysis of the CLIWOC project. The text of the final CLIWOC report was published by Herrera et al. (2003).

Clive Wilkinson (2012) describes the value of British logbooks used in a major scientific study, the CLIWOC project, which yielded every imaginable permutation of weather conditions and associated incidents. As such, he concluded, marine logbooks represent a rich resource for both the climatologist and the maritime historian.

The CLIWOC project

Undoubtedly, the most significant of the large-scale projects designed to examine the valuable information to be found in maritime logbooks, was the CLIWOC project between 2000 and 2003, which was funded by the European Union (Herrera et al 2003). This project brought together academic and technical partners from the United Kingdom, the Netherlands, France and Spain (Herrera et al. 2003). The aim was to analyse logbooks from the sailing vessels of Europe's major maritime powers over the period from 1750 and 1850, in order to develop a standardised method of extracting weather and climatological data. The study was based on the premise that officers of warships or large merchant sailing ships, such as East Indiamen, were highly trained observers and regular recorders of natural phenomena.

The CLIWOC project had four objectives:

1. To produce and make freely available for the scientific community the world's first daily climatological database for the period 1750 to 1850.
2. To realise the potential of the database to provide better knowledge of oceanic climate variability over the study period.
3. To use the information to extend and enhance the existing oceanic-climate databases.
4. To disseminate the proposal's findings and stimulate interest and awareness in this source with a view to fostering its further development and realising its scientific potential.

One of the major challenges was to standardise terminology, because the late 18th and early 19th century logbooks contained archaic measurements and vocabulary and were compiled in four languages: English, Dutch, French and Spanish. The project therefore concentrated on producing a dictionary of terms to complement the database. The observations recorded in the logbooks provided information on wind direction and strength, temperature, atmospheric pressure, currents, sea-state and, when in shallow water, shoaling and sea-bottom conditions.

The comprehensive nature of the records is evident from the following table.

Table 1: Number of CLIWOC logbooks and observation by country

Country	Logbooks	Observations
Spain	408	50,935
UK	591	88,475
Netherlands	613	126,541
France	12	7,378
TOTAL	**1,624**	**273,269**

Source: CLIWOC (2003:9)

Statistics for the Indian Ocean revealed that the British were more active than other European countries and dominated the region for well over a century:

Table 3: Breakdown of data-items by period, ocean and country

Country	Period	N-Atlantic Ocean	S-Atlantic Ocean	Indian Ocean	Pacific Ocean	All Oceans
Spain	≤ 1800	28,236	11,622	319	1,614	41,791
	> 1800	399	190	301	89	979
UK	≤ 1800	31,603	12,530	16,104	1,281	61,518
	> 1800	9,270	5,202	7,002	200	21,674
Netherlands	≤ 1800	20,045	5,109	5,142	0	30,296
	> 1800	31,932	18,348	26,617	1,481	78,378
France	≤ 1800	3,898	158	159	896	5,111
	> 1800	32	28	46	0	106
TOTAL		**125,415**	**53,187**	**55,690**	**5,561**	**239,853**

Source: (CLIWOC 2003: 20)

These statistics provide a graphic representation of the potential for assembling weather-related proxy data from logbooks.

The TANAP project

At approximately the same time that the CLIWOC project was being undertaken, a major multi-national archival digitisation project took place concerning the archives of the DEIC, scattered across southern and eastern Asia, southern Africa and the Netherlands. The DEIC, or in original Dutch, the VOC (Verenigde Oost-Indische Compagnie), was established in 1602 and awarded a monopoly over the spice trade between the Netherlands and Asia. This brought great wealth to the little Netherlands and brought Dutch settlement and formal slavery to the Cape of Good Hope in South Africa. The Dutch trading stations in the Middle East, India, Sri Lanka and Indonesia, all across what has been described as 'Monsoon Asia', generated vast quantities of records for the Heren XVII (the Lords Seventeen or governors of the VOC) back in the Netherlands.

As mentioned earlier, the purpose of the TANAP (Towards a New Age of Partnership) project was to digitise, preserve and popularise this immense resource of some 25 million pages scattered in repositories across three continents, which is held in archives in Cape Town, Chennai, Colombo, Jakarta and The Hague. Much of the TANAP's focus is on records revealing political and socio-

economic conditions, especially on interactions between the intruding Dutch traders and settlers as well as indigenous societies (UNESCO 2002).

While the VOC documentation does reflect descriptions of climatological interest, these are incidental to the core political and economic information that the TANAP project sought to highlight. The reason why the TANAP project is relevant to this topic is its value as a model of international archival collaboration. By linking information from three continents into one database, the TANAP project led to the better accessibility, interlinking and preservation of scattered records that were virtually unusable. The VOC records have now been inscribed in the Memory of the World Register. However, a relatively recent posting on the Genealogical Society of South Africa website indicates that the original TANAP website is currently not accessible (Olivier 2022.

There were differences of approach in the planning and execution of the CLIWOC and the TANAP projects. Archivists who defined the scope of the project, identified the records and interpreted their significance took on the leading role in the TANAP project with the help of historians. Archivists played a supporting role in the CLIWOC project, as the driving force was provided by the scientific community.

TANAP provides a potential model for the assessment and digitisation of documents that would form the platform from which historical climatology work in Africa could take place. At present, it appears that the scientists are in the driving seat of local research and archivists need to establish their professional role.

The work of historical climatologists in South Africa and their utilisation of archival sources are discussed in the following section. Thereafter, other potential sources in South Africa are examined before the possibilities across the ESARBICA region.

South Africa: Climatological research

The VOC archives in the Western Cape Archives Repository have already been mentioned in the context of TANAP, but this project was of political and socio-economic importance. Grab and Williams (2022) focused on the weather-related data available in the day registers (original Dutch *daghregister*). The series was originally kept by the first Dutch colonial commander, Jan Van Riebeeck, on his flagship travelling out from the Netherlands to the Cape. There was a carry-over effect when the registers were transferred from the ship to the land. Weather records were no longer kept to assist with navigation keeping as such, but Van Riebeeck took a personal interest in the information contained in the day registers. Given the Cape's location at the southern tip of Africa between the South Atlantic and the Indian oceans, the weather was highly variable. This threatened the safety of shipping in Table Bay and had an impact on agricultural activities.

Van Riebeeck instructed that the weather was to be the first item included in the day registers from 1652 until the collapse of the VOC in 1791. For the climate scientists, one of the most valuable aspects of the day registers was the consistent and systematic manner in which the record keeping was undertaken over many decades (Grab & Williams 2022 E 1785). As with the CLIWOC project, archaic forms of language, terminology and measurements had to translated and standardised. Grab and Williams' (2002) project processed and published the data extracted from the day registers for the final decades (1773 – 1791) of the VOC's administration of the Cape. The richness of the data obtained and the methodology they followed in interpreting and standardising it will enable future researchers to improve science's overall understanding of the Southern Hemisphere climate in the later eighteenth century (Grab & Williams 2022:E 1794).

Considerable research has also been undertaken into the historical climate of the nineteenth century in the arid Karoo region in the then Cape province of South Africa. This utilised documentary sources such as the accounts of early travellers and explorers, colonial official reports, diaries of long-established local families and local newspapers (Grab 2023 – see Table 1). The newspapers in particular gave regular reports on rainfall and other weather phenomena.

The catastrophic floods in the KwaZulu-Natal province in 2022 that particularly effected the coastal city of Durban have been placed in a historical context using the proxy data obtainable from documentary sources. Stefan Grab and David Nash have utilised both historical documentary records and modern meteorological measurements over a long period (from the 19th to the 21st centuries).

This includes:

- General storm and flood data produced by the SAWS (19th century to 2008)
- Archives of American, British, German and Norwegian missionary organisations housed in repositories in their respective countries
- Nineteenth century Natal newspapers available in academic and public libraries in KwaZulu-Natal
- Natal colonial reports, e.g. *Natal Blue Books* available through the KZN Provincial Archives Service and at the Killie Campbell Library of the University of KwaZulu-Natal in Durban
- Modern 20th and 21st century newspapers available online
- FloodList website (covering the period 2013 to presently) (Grab & Nash 2023:4)

This extensive and diverse range of research material enabled the researchers to demonstrate that flooding in KwaZulu-Natal was becoming more frequent and more intense and destructive (Grab & Nash 2023:4). From our perspective, it represents a synthesis of historical documentary sources, providing the proxy data and modern scientific measurements. This demonstrates the value of archival records in supporting scientific theories.

South Africa: Other potential sources for proxy data

As demonstrated by Grab and Williams (2022) in their work on Van Riebeeck's day registers, institutions managing ports, harbours and local shipping are also likely to provide records containing valuable proxy data. Harbour records in the Cape exist from the period of the two British occupations; the first from 1795 to 1803 and then from 1806 until self-government was established in 1872. During the British period, government activities grew more complex, and ports were established along the coast at Mossel Bay, Port Elizabeth and East London.

Lighthouses were built in many places along the coast as aids navigation (see Figure 1) and lighthouse keepers were experienced and trained observers of weather and sea conditions (in earlier periods, lighthouse keepers were often retired mariners).

Table 4: List of 19th century lighthouses along the South African coast

Name	Location		Construction Date
Bird Island	Algoa Bay	Eastern Cape	1852
Bluff	Durban	Natal	1867
Cape Agulhas	Cape Agulhas	Western Cape	1849
Cape Point	Simon's Bay	Western Cape	1860
Cape Recife	Algoa Bay	Eastern Cape	1851
Cape St Blaize	Mossel Bay	Western Cape	1864
Castle Point	East London	Eastern Cape	1860
Danger Point	Gansbaai	Western Cape	1895
Dassen Island	Yzerfontein	Western Cape	1893
Great Fish	Port Alfred	Eastern Cape	1898
Green Point	Cape Town	Western Cape	1824
The Hill	Port Elizabeth	Eastern Cape	1861
Hood Point	East London	Eastern Cape	1895
Mouille Point	Cape Town	Western Cape	1842
Port Shepstone	Umzimkulu River	Natal	1895
Robben Island	Table Bay	Western Cape	1865
Roman Rock	Simon's Town	Western Cape	1845
Seal Point	Cape St Francis	Eastern Cape	1878

Source: Baillie-Cooper (2006)

Logbooks of local coastal shipping are less easy to locate. However, some are likely to have survived in the collections of local museums rather than in provincial archives repositories. The Simonstown Museum collects and exhibits the cultural history of the people of Simonstown and their connections with the VOC and the Royal Navy (Simonstown Museum). The museum has the most comprehensive collection relating to the naval ships and operations along the Cape Coast and thus is an important potential source for climate change documentation.

The former Natal Archives Depot, now the Pietermaritzburg Archives Repository of the KwaZulu-Natal Provincial Archives Service, is the repository for records from the colonial era. These include the early records of the Port Captain and Harbour Department for Durban Harbour and of the Harbour Board. Durban was also known as Port Natal. Climatic conditions were closely observed, as access to the Bay of Natal was difficult and depended on a fortunate confluence of wind and tide. Natal records can also be accessed through NAAIRS, but an academic guide to the collections was compiled during the 1960s and a revised edition was published during the 1980s (Verbeek, Nathanson & Peel 1984). In addition to the records held in the provincial archives in Pietermaritzburg, the Killie Campbell Africana Library, part of the University of KwaZulu-Natal in Durban, has accounts of shipwreck survivors dating from the 16th and later centuries, as well as

early settlers and traders (although the focus is largely on anthropological, socio-economic and political issues (KCAL n.d.).

The Durban Local History Museum is also responsible for the maritime museum and therefore provides a potentially useful source of information. The logbooks of the ships in the maritime museum may also be traceable. Missionary accounts such as that of Grab (2023), were also of great value and a recent English translation of German missionary diaries was particularly useful (Kusel 2017).

Stefan Grab and his colleagues gave innovative examples of where to source the proxy data referred to by scientists from, which will provide food for thought for archivists.

Potential sources in the ESARBICA region

Based on the South African examples, archivists in the ESARBICA region have a rich variety of sources that should be highlighted.

As far as logbooks are concerned, we should investigate whether there are registers, logbooks or diaries from lighthouses. The coasts of Mozambique, Tanzania and Kenya would be the principal scenes for this investigation. Approximately 50 lighthouses are listed in Mozambique, three in Tanzania and 14 in Kenya (the extent to which these are all operational would require further investigation).

An almost unique opportunity arises on the African Great Lakes. Lakes Victoria, Tanganyika and Malawi are large enough bodies of water to generate their own weather systems. Locating documents that would reveal relevant proxy data that record changes in the weather patterns over these lakes would be of profound significance for global historical climatology. Harbour records from Kisumu and Mwanza on Lake Victoria and from Kigoma on Lake Tanganyika would be particularly important.

Remarkably, each of the lakes has been served by ships of great venerability. The motor vessel *Liemba* has been plying the waters of Lake Tanganyika since she served as a German colonial gunboat (*Graf von Goetzen*) during World War I. If they can be traced, her logbooks could provide unique weather-related data going back more than a century. On Lake Malawi, the motor vessel *Chauncey Maple* served the mission stations and lakeside communities and provided floating medical services from the beginning of the 20th century. Her logbooks could also provide a unique record of weather patterns and events. The African Lakes Company, that built and operated the ship to support missionary activity, discontinued in the early years of the 21st century and its records were donated to the Glasgow University Archives in Scotland, UK (n.d.). It is not known if any surviving ship logbooks were sent to Scotland with the rest of the records. The ship itself remained in Malawi until she was withdrawn from service and efforts to restore her failed in 2017. The history of the ships on Lake Victoria is not easy to determine.

In addition to these unusual potential sources, plantation records would be invaluable. Malawi has taken a professional lead in this regard, as demonstrated by a paper presented at the ESARBICA conference at the Birchwood Conference Centre in Gauteng Province, South Africa, in August 2023. Mankhwala (2023) describes a comprehensive programme, driven by the National Archives of Malawi, of locating planation records, arranging, selecting and digitising them. Digital copies were provided to the Malawi Archives partner, The British Library (Mankhwala 2023). While

weather-related records were not specifically mentioned in this presentation, the comprehensive nature of the project indicates that it is likely that if weather-related records existed in the plantation records, they could be retrieved and processed in future projects.

Conclusion

This paper highlighted the significance of archival sources for weather and climatological research within the discipline of historical climatology. The major archival CLIWOC and TANAP digitisation projects have been described, as well as the research undertaken using archival records in South Africa. Additional potential sources in South Africa have been suggested and, based on the South African examples, potential sources in other ESARBICA countries have been suggested according to the type of institutions and ships known to have operated, or are still operating, in ESARBICA countries.

It would be highly advantageous if ESARBICA were to develop and endorse a project intended to identify records containing weather-related data in the region, arrange for the transfer of such records to the relevant national archives, their archival capture and processing and, finally, their digitisation.

Such a project would further regional cooperation and demonstrate Africa's ability to provide intellectual and scientific leadership in its own right. This would enhance the importance of the archival profession within the region and internationally.

The project could be submitted to IORA for adoption and funding support. It could also lead to a broader project involving other countries around the Inian Ocean rim.

It is therefore proposed that ESARBICA should scope and develop an African TANAP-style project to IORA that could attract funding from UNESCO and the Middle Eastern countries to investigate the potential climatological archival sources in the archives of our region, to catalogue, conserve and digitise those located and to develop the necessary metadata to provide the standard baseline data needed by Africa's scientists.

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Note:

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