



**Archaeological and palaeoecological implications of charcoal assemblages dated to the
Holocene from Great Zimbabwe and its hinterland**

Joseph Chikumbirike

A thesis submitted to the Faculty of Science, University of the Witwatersrand, in fulfillment
of the requirements for the degree of Doctor of Philosophy

The University of the Witwatersrand

2014

DECLARATION

I declare that this thesis is my own, unaided work. It is being submitted for the Degree of Doctor of Philosophy in the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.



(Signature of candidate)

_____ 8 _____ day of __ May _____ 2014

Dedication

This thesis is dedicated to my late brother in – law who even on the last stroke of his breath continued to encourage me until I get to the top. The road of life has many detours, till we meet again.

ACKNOWLEDGEMENT

I would particularly like to thank PAST, Wits PMA, NUFU whose support and funding of my study made this thesis possible. I would also like thank NMMZ for allowing me to carry out my research on their charcoal collections.

This dissertation would not have been possible without the guidance and the help of several individuals who in one way or another contributed and extended their valuable assistance in the preparation and completion of this study. Foremost, I would like to express my sincere gratitude to my advisor Prof. M Bamford for the continuous support of my Ph. D study and research, for her patience, motivation, enthusiasm, and immense knowledge. Her guidance helped me in all the time of research and writing of this thesis. I could not have imagined having a better advisor and mentor for my Ph.D study. Dr. Amanda Esterhuysen co-supervisor to Professor M Bamford, for her patience and steadfast encouragement to complete this study, for her unselfish and unfailing support as my dissertation adviser; for the moral support despite her just being newly appointed; for the insights she has shared. They have shared valuable insights in the relevance of the study.

Professor B Rubridge, Director of the Bernard Price Institute (now Evolutionary Studies Institute) for being supportive and accommodating to our requests. I am grateful for all the assistance from Dr Ngoro, whose sincerity and encouragement I will never forget. Dr. M Manyanga has been my inspiration as I hurdle all the obstacles in the completion this research work. I am grateful for the thoughtful comments and wonderful support. Thanks mukoma for making sure that I would not starve and remain focused. You have been a brother always. Dr S

Chirikure thanks always for sharing your wisdom and encouragements, Professor G Pwiti for the support at UZ and Wits, Dr Mahachi for granting permission to export the charcoal assemblage to South Africa Wits University. I would also like to extend my appreciation to Dr Plan Shenjere Nyabezi and Ms Tendai Musindo for their encouragements and moral support. To Mr Mukundishe Chifamba, Mr Justine Magadzike and Mr Russel Kapumha thank you very much for assisting with maps. To Dr Katsamudanga and Ms Nhamo thank you so much for constantly checking on my progress. Walker James provided the link with Professor M Bamford. Dr Taru thanks for walking the road with you and sharing the various experiences at Wits. We together toiled and traversed the dynamic landscape and encouraged each other besides all the hardships. I felt so encouraged when you made it, besides all the challenges we endured together.

Last but not the least, my family and the one above all of us, the omnipresent God, for answering my prayers for giving me the strength to plod on despite my constitution wanting to give up and throw in the towel, thank you so much Dear Lord. I thank you for supporting me spiritually throughout my life.

Abstract

In most of Africa archaeological charcoal samples are often used to establish chronology through radiocarbon dating, but are rarely used to address why people may have selected specific wood taxa for particular purposes. This thesis is an enquiry into the palaeo-ethnobotanical and palaeoecological implications of charcoal assemblages dated to the late Holocene from the Great Zimbabwe and Chigaramboni sites, Zimbabwe. The research provided a more detailed picture of socio-economic utilization of wood, such as the use of woods for iron smelting, construction and domestic hearths. Previous excavations at Great Zimbabwe and Chigaramboni have produced large samples of charcoal at specific activity sites and at a few different depths thus giving a minor perspective of time. There was a wider selection of wood at Great Zimbabwe as compared to Chigaramboni. Charcoal samples analyzed in this thesis are a product of purposeful human action and they represent a subsample of the local vegetation and related human activities contemporaneous with the period of sites' use. A substantial effort has been invested in the development of a modern vegetation reference collection database. This will go a long way in assisting future researchers in the region and is an extremely valuable and essential primary contribution to the development of wood charcoal studies in the region.

Thirty different tree species were burnt at Great Zimbabwe and indicate the multipurpose nature of the settlement. In contrast only 14 species were exploited at Chigaramboni which is an iron and metallurgical processing site. The latter fuel woods were also used at Great Zimbabwe. Based on the cracks and fissures in the charcoal it is postulated that the firewood used in metallurgy were collected whilst they were wet.

Since *Spirostachys africana* and *Colophospermum mopane* do not occur in the area today it is suggested that there was long distance movement of wood, particularly those with excellent construction qualities. It is quite possible that the inhabitants of Great Zimbabwe, or their trading partners, opted to travel long distances in order to collect those particular logs. The fuel woods used at the two sites occur in the region today so it is likely that the Miombo woodlands of Great Zimbabwe and Chigaramboni have not changed notably from the time of occupation by their original inhabitants to date. Based on the mesophytic species identified, such as *Acacia robusta*, *Acacia sieberiana*, *Acacia xanthophloea*, *Acacia polyacantha*, *Acacia burkei*, *Faurea saligna*, *Schotia brachypetala*, *Kigelia africana* and *Parinari curatellifolia*, it is concluded that the inhabitants of ancient Great Zimbabwe and Chigaramboni archaeo-metallurgical site experienced a mesic environment. New excavations of different occupation levels would be required to determine vegetation and climate fluctuations during the past but at present there is a moratorium on such disturbance of the historical sites.