

The archaeology of Komati Gorge

Forming part of the broader project Exploring precolonial agriculture and intensification: the case of Bokoni, South Africa

1. Introduction

The complex terraced and stonewalled sites at Bokoni (Fig. 1) in Mpumalanga Province in South Africa comprise the most detailed built footprint of pre-colonial society in southern Africa. The evidence of precolonial intensive agriculture there, furthermore, forms part of a wider pattern of "islands" of intensive agriculture in Africa, which are in stark contrast to many established ideas of precolonial African agriculture as backward and based mainly on extensive and shifting cultivation.

Further mapping and excavations of two Stonewalled and terraced sites in the Komati Gorge (Fig. 2) will contribute to the broader aims of the Bokoni project, as set out in this proposal. The proposed excavations will take place at sites near the river and sites further upslope (Fig. 3), and will focus on understanding the construction of the sites, and obtaining samples for dating as well as scientific soil and microfossil studies.

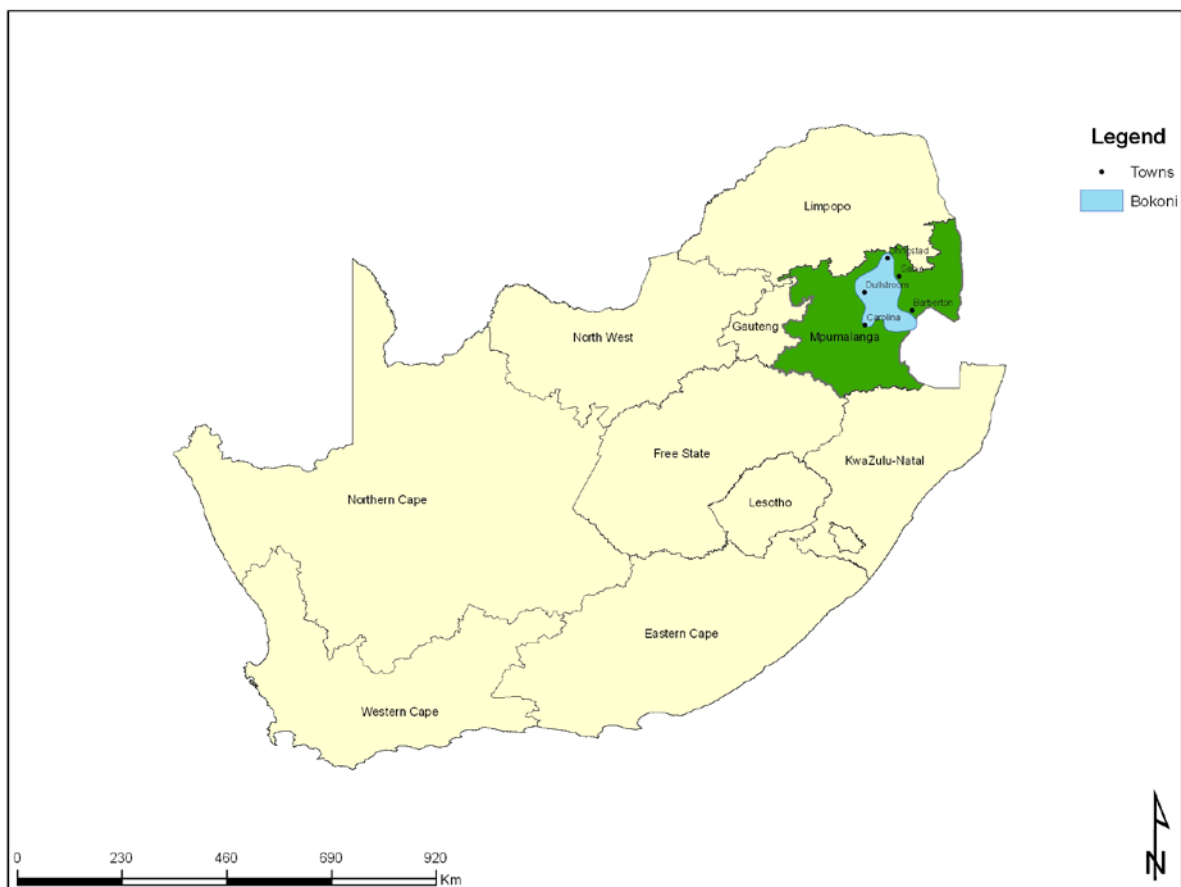


Figure 1. Known spatial location of Bokoni, constructed from oral traditions and stonewalled site distribution.

2. Aims & Rationale

The case of Bokoni potentially offers important evidence of a locally developed farming knowledge within South Africa, a knowledge which has been lost or made invisible during the late 19th and the 20th centuries. By bringing together South African scholars, historians and archaeologists, engaged in the recent NRF-funded Five Hundred Year Initiative and Swedish historical and physical geographers, with experience from researching similar islands of intensive agriculture in eastern Africa, this project aims at a concerted interdisciplinary effort to

- 1) Establish the character of the agricultural system of Bokoni in the early 17th century
- 2) Explore the political and economic context leading up to this intensification.
- 3) Contribute to the wider debate on the factors behind agricultural intensification and investments in soil and water conservation in Africa's past and present agricultural landscapes.

3. Exploring pre-colonial agriculture and intensification: the case of Bokoni, South Africa

1. Specific aims

The complex terraced and stonewalled sites of Bokoni in Mpumalanga Province in South Africa comprise the most detailed built footprint of any pre-colonial society in southern Africa. The evidence of pre-colonial intensive agriculture in this region, furthermore, forms part of a wider pattern of "islands" of intensive agriculture in Africa, which are in stark contrast to many established ideas of pre-colonial African agriculture as backward and based mainly on extensive and shifting cultivation. The case of Bokoni also potentially offers important evidence of a locally developed farming knowledge within South Africa, which has been lost or made invisible during the late 19th and the 20th centuries. By bringing together South African historians and archaeologists, engaged in the recent Five Hundred Year Initiative, with Swedish historical and physical geographers, with experience from researching similar islands of intensive agriculture in eastern Africa, this project aims at a concerted interdisciplinary effort to

1. Establish the character of the agricultural system of Bokoni in the early 19th century.
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3. Contribute to the wider debate on the factors behind agricultural intensification and investments in soil and water conservation in Africa's past and present agricultural landscapes.

The project closely articulates with the NRF funded Five Hundred Year Initiative (FYI), which is an inter-institutional and cross-disciplinary project that interrogates different source materials, including archaeological, oral, documentary and pictorial materials, to further illuminate the history of the last 500 years across southern Africa. The FYI sees this period as a strikingly unexplored and misrepresented period of our past, which remains disfigured by

colonial and apartheid categories and assumptions, most notably in the way that African societies are represented as fixed, passive, isolated, unenterprising and unenlightened.

2. Survey of the field

Pre-colonial intensive agriculture in Africa

Contrary to many established ideas about sub-Saharan African pre-colonial agriculture there are, and have been, several instances of intensive agriculture (flood retreat cultivation, irrigation, terracing, manuring, etc.) alongside with the better-known shifting agriculture. The relation between intensive and extensive agriculture is still however an insufficiently explored theme, which has important significance for the understanding of pre-colonial political and economic history. Furthermore, there is a historic relation between the intensity of agriculture and the labour division between men and women. Historical studies of intensive agriculture have therefore a potential for highlighting gender relations, an aspect that has been largely overseen since the discussions in the first part of the 20th century (see e.g. Baumann 1928).

The research into local knowledge of and driving forces behind terracing conservation is also of relevance for the present land degradation debate (see e.g. Critchley & Netshikvhela 1998). Localised cases of pre-colonial terracing and intensive agriculture are known from different parts of Africa, from the Dogon (Mali) in the west to Bokoni (South Africa) in the south. Some of these areas are still farmed today, while others are, like Bokoni, abandoned. Under the heading *History of African agricultural technology and field systems* the first comprehensive overview was published as a special volume of *Azania* in 1989. Sutton there summarised the state of research, focussing especially on cases in eastern Africa (Sutton 1989), but also in cooperation with Grove gave an overview of the then existing knowledge of all Sub-Saharan cases of terracing (Grove & Sutton 1989). Since then the knowledge of such areas has increased and a broader comparative perspective is now possible – especially concerning the two best known southern African cases.

In 2002 Robert Soper published an extensive archaeological investigation of the terraced fields in Nyanga in Zimbabwe (Soper 2002). Since the presentation by Tim Maggs of the paper “From Marateng to Marakwet: islands of agricultural intensification in Eastern and Southern Africa” at a congress in Harare, the case of Bokoni (previously known as Marateng) has become part of this broader understanding of the distribution of such farming systems. Maggs presentation also inspired a Swedish-led project focussing on “islands” of intensive agriculture in Tanzania, Kenya and Ethiopia (Widgren and Sutton 2004). The detailed investigations by Börjeson formed the basis of some important re-evaluations as to the possible explanations of intensification. While some past research focussed on the presumed isolation of such intensive farming communities, and has seen them as outcomes of a refuge situation, Börjeson was able to show that a reversed situation may have occurred. Instead of intensive farming being forced by population concentrations due to a siege situation, Börjeson interpreted the high population densities as the outcome of intensive agriculture, rather than the cause of it (Börjeson 2004, 2007). Furthermore, these investigations were able to show how intensive agriculture was a response to a geographical labour division fuelled by the informal exchange between different agricultural groups and between agriculturalists and pastoralists (Widgren 2004). The relations between, on the one hand,

formal and informal exchange and on the other investments in landesque capital have been further elaborated by Håkansson and Widgren (2007) focussing on different areas in Tanzania.

Recent research at the abandoned site in Engaruka (Stump 2006, Westerberg et al. forthcoming) and the active irrigation system at Pokot (Davies 2009) have contributed to this debate in two important ways. First they are, to a much larger extent based on archaeological investigations of fields and irrigation structures (rather than on the associated settlements). Westerberg et al (forthcoming) have also brought the analysis of the Engaruka system into an interdisciplinary framework. Secondly they have, developed the theoretical framework (see especially Davies forthcoming). Davies developed the idea of informal exchange as a factor behind intensification and connected that factor to the wider issues of the origin of agriculture in Africa.

The Bokoni sites

The complex terraced and stonewalled sites between Orighstad and Carolina in Mpumalanga have captivated many generations of South African archaeologists (e.g. Van Hoepen 1939; Evers 1975; Maggs 1995, 2008). Settlements cover an altitude range from a little below the crest to some of the deeper incised valleys. Most are in montane grassland, with relatively high rainfall, while the lower outliers extend into savannah. Already by 1975 Evers had shown how complex the sites were, with up to 200 homesteads in a single built-up area (Maggs 2008). Not only are the homesteads preserved but also the network of linking roads and the vast areas of agricultural terraces. The road systems are by far the longest and most complex in southern Africa, while the terraces represent, apparently, the only field systems to have survived from pre-colonial times. The implication of the scale has not been grappled with yet, because much of twentieth century southern African archaeological research on farming communities focused on identity and structuralist patterns. Consequently, research in Bokoni by Collett (1979, 1982), which focussed on the function of stone walled structures, used ceramic style to identify the occupants as Pedi, ignoring historical sources that indicate that the stonewalled sites formed part of Bokoni.

The omission of historical sources severely limited the scope of research and resulted in the misidentification of the occupants and builders. Recent research by members of the Five hundred Years Initiative (e.g. Maggs 2008; Delius and Schoeman 2008) used oral traditions and historic sources to demonstrate the sites formed part of Bokoni. This identification facilitated placing the sites in a historic context and allowed for research into the economy of the region.

This research has only started but it has become clear that the site distribution articulates the importance of trade but that site architecture materializes an economy focused on food production. Maggs (2008) suggested that the field systems visible at these sites can be viewed as islands of agricultural intensification (similar to the sites in East Africa) These highly specialised agricultural regimes in eastern Africa share some of the following features (op cit):

1. Terracing of hillside fields.
2. Specialised manipulation of soil including levelling of plots, mounding and ridging

3. Irrigation.
4. Stall-feeding of cattle.
5. Manuring of fields.
6. Composting/mulching of fields.
7. Specific crop rotations.
8. Adoption of new crops.

The Bokoni sites include a number of these features. The thousands of hectares of terracing and the hundreds of kilometres of roads represent a massive investment in landesque capital, and are the result of very substantial mobilisation of labour. It is the scale of this investment that sets Bokoni apart from all other precolonial societies in South Africa. It is possible that the terracing was a response to specific soil chemistry but also could have been a response to the introduction of a new crop – maize – that requires more moisture than sorghum, the traditional crop in southern Africa.

These are fundamental questions, and consequently establishing the character of the Bokoni agriculture is key to understanding of how this intensively settled area developed. The Bokoni sites however are not limited to agriculture. The paths and cattle enclosures also materialise a concern with large-scale livestock farming. All evidence gathered so far indicates that the Bokoni agricultural system was advanced in so far as it displays a close integration of grain cultivation and livestock farming and well developed methods for soil and water conservation.

There are also clear indications linking the development of intensive agriculture with broader socio-political processes. Maggs (2008) and Delius and Schoeman (2008) have found that the archaeology of Bokoni stonewalled sites document the political history of the area and the development of a complex economy and in which agriculture played a major role.

Laboratory methods

The questions raised in the recent studies on pre-colonial intensive agriculture focus on chronology, farming practices, crops, soil and water conservation and the integration of grain and livestock. To a certain degree these questions can be answered by established archaeological and historical methods. But the recent advances in laboratory methods in archaeology and palaeoecology have dramatically increased the possibility to give precise answers to many of them.

A few examples that are relevant for this investigation are presented below. In one of the pioneering scientific studies on pre-colonial agriculture in southern Africa, Jeanette Smith investigated agropastoral production strategies in the Limpopo basin between AD 900 and 1400. Her work, mainly based on multi-stable isotope analyses, showed that farmer responses to climate fluctuation and increased population included development of floodplain agriculture, cattle transhumance and building social resource networks (Smith 2005, Smith et al. 2007).

In the Swedish context a central question for Iron Age archaeology has been the introduction of manuring and of stall feeding, and important results have been achieved through standard palaeoecological methods (macrofossils and pollen analysis). But the development

of the analysis of siliceous microfossils (phytolithes and diatoms) in soil samples has opened up new possibilities in analysing plant remains in archaeological contexts (Risberg et al 2002). For the analysis of abandoned agricultural soils these methods can e.g. answer questions on crops and of manuring.

One possibility for the question of manuring is for example to analyse soil samples for occurrences of Chrysophyte stomatocysts. These are resting spores from golden algae and their growth is to a high extent favoured by the presence of nitrogen (e.g. Pla et al. 2004). Of special interest in this case is also the fact that phytolithes from maize are relatively easily identified.

3. Project description and mode of cooperation

This project is designed to take advantage of the confluence of three related strands of research:

- A) the theoretical discussion among geographers and archaeologists on forces behind agricultural intensification (which has so far focussed on eastern Africa),
- B) a new approach to the last 500 years in which the cooperation between archaeologists and historians in South Africa, makes possible a close reading of the social, economic and political context and
- C) new developments in laboratory methods in South Africa as well as in Sweden and elsewhere.

The Bokoni sites are in a unique position in providing the material to answer some of the larger questions on intensive agriculture. Among all the known African sites they were abandoned comparatively late, at a time when oral and documentary history can contribute to building a clearer picture than is the case for example at Engaruka (Tanzania) and Nyanga (Zimbabwe). On the other hand, in contrast to the historical farming systems still in use (like Marakwet and Pokot) they provide a chronologically better defined footprint.

The aim of this project is thus to:

- Establish the character of the Bokoni agricultural system in the early 19th century (cattle manuring, crops, tools, soil and water conservation, dating).
- Investigate and explain the political and economic context leading to this intensification.

The historic records provide in depth insights into the complex processes in Bokoni in the eighteenth and nineteenth century, but are less precise on earlier periods. The combination of archaeology and historical data, however, can address these gaps. Specific challenges include identifying the material culture and spatial signatures for the various time periods. Oral traditions indicate that sites in the southern parts of Bokoni, e.g. those on the Komati River, were abandoned in favour of a shift to the north. Excavation of sites in a range of locales mentioned in the oral traditions will be used to try to clarify the occupation sequence. Establishing a clear occupation sequence will assist in illuminating the development of farming practices.

Research on the detailed aspects of farming will focus on the structure of crop and livestock management. It will employ three different methodologies. First, documented African

agropastoralist cultural systems will be explored to provide comparable environmental parameters and management practices that are required to sustain, intensify and extend agropastoral production in semi-arid regions. Secondly, analysis of settlement patterns and field systems will provide insights into farming practices and help identify places where excavations and sampling of arable fields, possible dung heaps, etc can be done. Thirdly the environmental history for the Bokoni area will be reconstructed, through analyses relevant palaeoecological material directly associated with settlement layers and anthropogenic soils.

It can already now be established that analyses of multi-stable isotope on archaeologically recovered livestock bones and teeth will be an important part of the investigation of the agri-pastoral economy that accompanied the intensification of farming. A particular focus will be on the application of strontium and stable carbon isotope analyses to identify: 1) whether livestock was herded locally or traded-into settlements and 2) whether livestock was herded in more distant locations on permanent or seasonal bases in response to environmental and climatic variability in pasture.

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