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Space syntax on the East African coast:

defining characteristics of elite residential space

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ABSTRACT

This paper focuses on the East African coast, where precolonial Islamic towns featuring rich architectural heritage engaged in long-distance trade at least since the 11th century. The coastline that extended for nearly 3000 km was dotted with city states, and the preserved material culture suggests that the residents of these towns shared multiple aspects of identity and lifestyle. The architectural evidence of stone houses, probably built by the urban elite, consists of structures ranging in size from just a few to approximately 50 rooms. Apart from detailed studies of individual buildings, which have resulted from a number of archaeological projects, comparative analyses are highly relevant, especially in terms of assessing the extent and configuration of the houses on various sites.

Space syntax is presented as a useful tool for employing the much-needed comparative perspectives. As opposed to the traditional graphic representation, in this study space syntax is presented directly on layout plans to facilitate its combining with other types of architectural analyses. The results show that there were significant similarities in the organisation of the houses along the coast. This includes the fact, that the palace-complexes were built incorporating small house-like units and that the courtyards played an important role in the connectiveness inside the house and accessibility from the outside.

KEYWORDS

Swahili coast, precolonial urbanism, houses, layout, accessibility

1   INTRODUCTION

On the Swahili coast of East Africa, there is a rich archaeological evidence of Islamic urban settlements, that flourished at least from the 11th century CE and engaged in long-distance trade along the rim of the Indian Ocean and to inland Africa. Monumental residential structures still preserve on many of the deserted sites, some classified as palaces and others as stone houses. The Swahili building tradition has been documented along the nearly 3000 km long strip of the coast, and represents a unique example of cultural coherence in an environment that has never united in larger political structures, having functioned as city-states or at most in temporary alliances of a few settlements. Even today, the coast remains a distinctive cultural zone within the modern states including Kenya, Tanzania, or Mozambique. What represented these shared social and cultural notions and how they may be identified in the material culture, remains an important object of discussion among researchers (Wynne-Jones & LaViolette 2018).

Archaeological and historical studies of the post-colonial era have strived to uncover more details on the Swahili use of space in the past. In terms of the built environment, some building typologies have been established, including a detailed description of the mosques, mortuary architecture and distinctive architectural features such as stepped courtyards (Garlake 1966, Gensheimer 2001). Comparative classifications of sites on the basis of their extent and spatial context were conducted and convincingly discussed by Thomas Wilson (1982). However, comparative analyses of houses on the basis of their layout remain underexplored. The present analysis aims to show that the study of physical and sensory access based on space syntax may reveal much more information about the underlying characteristics of the elite residential buildings from the precolonial era (Baumanova & Smejda 2018).

2   METHODS OF INVESTIGATIONS

This study applies space syntax (Hillier and Hanson 1984) to analyse the layout of stone residential structures on the Swahili coast. The building material suggests that stone houses were probably associated with the local elites. Wattle-and-daub houses were likely more abundant but do not preserve above ground. Smaller stone houses that were often built in house blocks consist on average of 4-5 rooms including a small courtyard. In the present paper, these have been analysed and contrasted with the results of access analyses of large palace complexes that usually consist of around 50 rooms and multiple open-air courtyards.

An alternative graphical representation of space syntax is adopted to show directly on layout plans how the spaces within buildings are distributed into individual levels of depth and to facilitate their immediate comparisons. In this manner, it has been possible to reveal whether the palace-complexes share similar structural features with smaller houses and how they compare with one another across sites in this extensive region. Space syntax also facilitates an analytical

classification of houses into categories based on the ratio of the number of enclosed spaces/rooms and entrances, as well as the identification of individual houses within larger house blocks.

3   DATASETS

The initial assessment considers the stone residential structures that may be found on archaeological sites along the coast in terms of the relative ratio of rooms and courtyards.

Table 1: The table lists a sample of stone buildings on the Swahili coast, with their respective number of spaces and entrances.

Category	Building	No. of connected spaces	No. of entrances	No. of courtyards
A	Gede – House of the Ivory Box	5	1	1
A	Gede – House of the Cowries	8	1	1?
A	Gede – House of the Scissors	5	1	1?
B	Gede – House of the Panelled Walls	10 (+4)	1 (+1)	1
B	Gede – House of the Cistern	10 (+5)	2	1
B	Kilwa – House of the Portico	20 (+3)	1 (+1 or 2)	2
B	Kilwa – Great House – West Dwelling	17	1 (+1?)	2
B	Kilwa – Great House – East & Central Dwelling	17 (+4) & 10 = 27 (+4)	3	3
C	Gede palace complex	46 (+8)	4 (+2)	4
C	Kilwa – Husuni Kubwa	51	2	4
C	Kilwa arch. – Songo Mnara palace complex	60 (+ 20)	4 (+3)	6

Table 1 reveals that the houses may be grouped in approximately three categories A-C, in which the number of rooms correlates with the number of open-air courtyards, as well as with the number of entrances. The classification into three categories may be justified by the fact that approximately with every 10 rooms, the number of entrances and courtyards increases by one. With the growing size of the buildings, additional entrances and courtyards increase the capacity of the building for interaction, social space and connectivity between the indoor and outdoor space.

Another important comparative aspect is how these spaces and courtyards are configured. This may be shown with the use of access analysis directly on the layout plans. On the following figures 1-3, the spaces are numbered and coloured from yellow to deep brown in levels of access from the entrance, following the principles derived from the access analysis principles (Hillier and Hanson 1984). Figure 1 shows a house with a single entrance and the most common size of a regular coastal stone house of 5 delimited spaces. These are arranged in a relatively deep

configuration of 4 levels of access. These rooms are built in a linear sequence from the entrance to the back of the house.
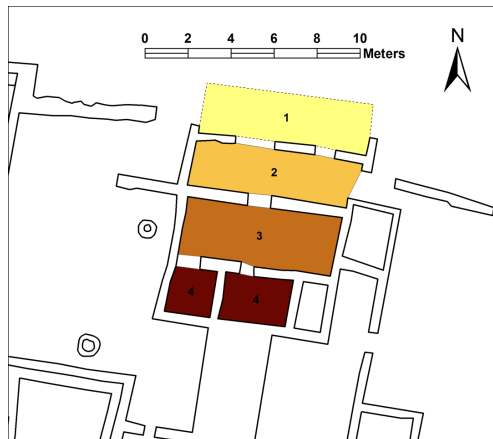

Figure 2: The House of the Cowries at the site of Gede, Kenya. Numbers and colours represent access analysis graph from the entrance to the back of the house.

Figures 2 and 3 show two palace complexes for comparison, one located in present day Kenya and the other in Tanzania, which are also listed in Table 1. Each of these has 4 entrances and 4-5 courtyards. The complexes are nevertheless organised on a similar number of access levels to the smaller house shown on Figure 1. Both complexes on Figure 2 and 3 also incorporate within their layout constellations of several rooms, highlighted on the layout plans in blue, which are reminiscent of the configuration of a small house such as that on Figure 1.

Figure 2: The palace complex at Gede, Kenya. The picture on the left shows the access analysis represented in numbers and colours. The picture on the right shows the integration of small 'house-like' units into the palace structure.

Figure 3: The palace complex at Songo Mnara, Tanzania. The picture on the left shows the access analysis represented in numbers and colours. The picture on the right shows the integration of small 'house-like' units into the palace structure.

4   RESULTS

The following observations may be made on the basis of the space syntax analysis:

- The number of entrances and courtyards increases by one approximately with each 10 rooms. On the other hand, the depth of the buildings does not increase proportionately to the number of rooms. Small houses with 4-5 rooms usually have 4 levels of depth, while those with 50 rooms have mostly 5, exceptionally 6.

- The courtyards were usually located on the second level of depth from the entrance.

- The palace-complexes to some extent consisted of or incorporated smaller in-built units that had the same layout like small stone houses of 4-5 rooms.

5   CONCLUSIONS

In this study, space syntax has been used to aid in revealing underlying patterns in residential buildings, which appear incomparable in terms of scale and originate from different sites. The results suggest that the architectural record on the East African coastal sites represents a rich source of evidence, not only in terms of building material or preserved monumental architecture, but also in terms of a distinctive tradition of spatial organisation.

The spatial configuration of elite residential spaces incorporated accent on preserving the layout of 4-5 room house units even within the large palace-complexes. Comparing the smaller stone houses and palace-complexes of various sizes suggests that with the growing size of the building, with every 10 rooms an additional entrance and courtyard were added. This resulted in the pattern when large houses of 50 rooms had a similar configuration and depth to the small houses with just 5 rooms. This shows that a spatial communication aspect may have been an important component of social power relations to the extent this was represented in the palatial complexes.

ACKNOWLEDGEMENTS

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