Gerald Steyn

African courtyard architecture: Typology, art, science and relevance

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Abstract

Because current international trends in urban design principles are towards compact neighbourhoods and housing, attempts to accommodate South Africa's lower-income households in massive schemes of identical little free-standing houses is increasingly being questioned. But instead of only considering Euro-American models, should planners and architects not also investigate traditional settlements for formative ideas Most sub-Saharan vernacular dwellings, including the archetypal clustering of huts around an open living space, are conceptually a courtyard configuration, and courtyard housing offers relatively high densities, privacy and protected outdoor living space, as well as allowing a social mix – all desirable characteristics of a good contemporary neighbourhood. This study attempts to determine the relevance of traditional African courtyard houses for contemporary urban solutions by investigating a number of representative examples in terms of their potential for densification, ability to provide privacy and psychological well-being, climatic behaviour and responsiveness to social and economic needs. While both informal and formal housing have been wasteful in the use of land, functioning historic towns along Africa's East Coast arguably offer ideas and concepts for the definition of a true African neighbourhood. The study suggests that, from the synthesis of historic precedent and custom, a contemporary model of courtyard houses could be developed that would contribute towards much more compact, low-energy and socio-economically equitable neighbourhoods.

Keywords: African architecture, courtyard architecture, African urbanism

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Abstrak

Omdat internasionale tendense in stedelike ontwerp tans na kompakte woon-buurte en behuising neig, word pogings om Suid-Afrika se laer-inkomste huis-houdings in massiewe skemas met identiese klein losstaande huisies te huisves toenemend bevraagteken. Maar in plaas daarvan om slegs Euro-Amerikaanse modelle te oorweeg, moet beplanners en argitekte nie ook tradisionele ne-dersettings ondersoek vir vormende idiees nie Die meeste inheemse huise in sub-Sahara Afrika, insluitende die aartstipiese groepering van hutte rondom 'n oop leefruimte, is konseptueel binnehofkonfigurasies, en binnehofhuise bied 'n relatief ho woondigtheid, privaatheid en beskermde veilige buite-leefruimtes, en maak sosiale vermenging moontlik – almal begeerlike eienskappe van 'n goeie hedendaagse woonbuurt.   ierdie studie poog om die toepas-likheid van die tradisionele binnehofhuise van Afrika vir hedendaagse stede-like oplossings te bepaal deur 'n aantal verteenwoordigende voorbeelde te ondersoek wat betref hul potensiaal vir verdigting, hul vermo om privaatheid en sielkundige behaaglikheid te verskaf, hul klimatologiese gedrag en hul responsiwiteit teenoor sosiale en ekonomiese behoeftes. Ofskoon sowel infor-mele as formele behuising grond verkwis het, is daar geskiedkundige dorpe langs die Ooskus van Afrika wat idees en konsepte bied vir die defini ring van 'n ware Afrikawoonbuurt.   ierdie studie stel voor dat daar uit die sintese van historiese voorbeeld en gebruik 'n eietydse model vir binnehofhuise ontwikkel kan word wat tot baie meer kompakte, lae-energie en sosio-ekonomies reg-verdige woonbuurte kan bydra.

Sleutelwoorde: Afrika argitektuur, binnehofargitektuur, Afrika stedelikheid

1.   Introduction and historical background

Compact neighbourhoods and clustered housing are firmly entrenched principles in the New   rban movement and rapidly becoming institutionalised in many parts of the world as a more sustainable alternative to suburban sprawl. The row upon row of small, identical, box-like, freestanding low-cost houses on the periphery of South African towns and cities are unquestionably problematic – not only is the wasteful low-density detached-unit approach of the past being perpetuated, but the situation is actually worse because these units are even more remote from economic opportunities, smaller and often of a much lower quality. In fact, the critic Alan Lipman not only laments the persistent provision of these single house per plot layouts to the exclusion of clusters, courtyards and other forms of low-rise high-density housing, he also accuses local planners and architects of not having learned anything from traditional South African settlement models (2003: 95).

One of the first manmade shelters was probably the 'living-room floor', a Paleolithic phenomenon, which originated about a million years ago in the Rift Valley of East Africa, the cradle of humankind. Fences and windbreaks were added, and the space was sometimes cobbled (Oliver, 1999: 21, 23). This arrangement eventually evolved into the temporary shelters of nomadic hunter-gatherers like the Khoisan.

The great Bantu migrations, however, changed this Stone Age landscape. These iron-working agriculturalists gradually moved from their cradle land in West Africa and established villages consisting of more permanent huts (Reader, 1999: 184). The dissemination of their language, Bantu, is significant: it is a language family that originated in the eastern Nigeria-Cameroon region and is the dominant language of Africa south of the equator. Most authors broadly agree that the Bantu reached Lake Victoria by about 200 BC and the Indian Ocean by 200 AD, and moved down the Zaire and through East Africa, reaching the northern parts of Mpumalanga and KwaZulu-Natal by 300 AD, and the most southern limit of their expansion by about 1700 AD (Wilcox, 1988: 95) (Figure 1). The characteristic circular floor plan with wattle-and-daub walls and conically thatched roof evolved during the Early Iron Age, 7th century BC (Garlake, 1978: 61; Oliver 1999: 84), and indeed seems to predominate in some areas to this day (Figure 2). These dwellings have been built

without architects and are classified as vernacular. Such buildings are not designed to academic theories and rules, but rather follow the traditions of the people, as found in particular places.

Papanek (1995: 14) identifies some of the characteristics of the vernacular as human scale, a less self-conscious image, the use of local materials, customs and tradition, a good 'fit' with local ecology, energy efficiency and protection of raw materials. No wonder Chrisna du Plessis of the CSIR writes: In a sense, this early architecture of grass or mud huts   can be seen as the ultimate in green architecture (2001: 4) – a sound basis for a contemporary contribution to the international discourse on sustainable building and urbanism.
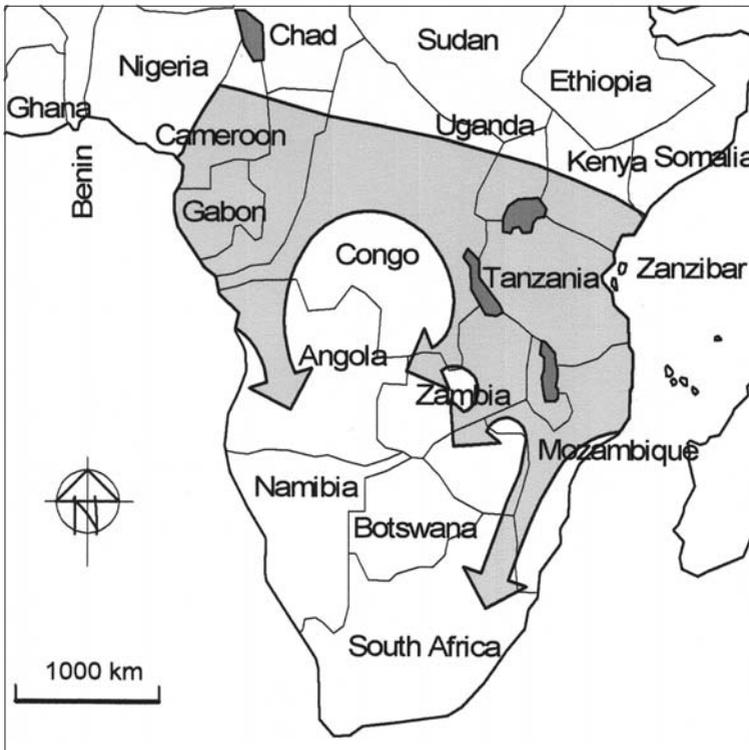

Figure 1: Map of the great Bantu migration
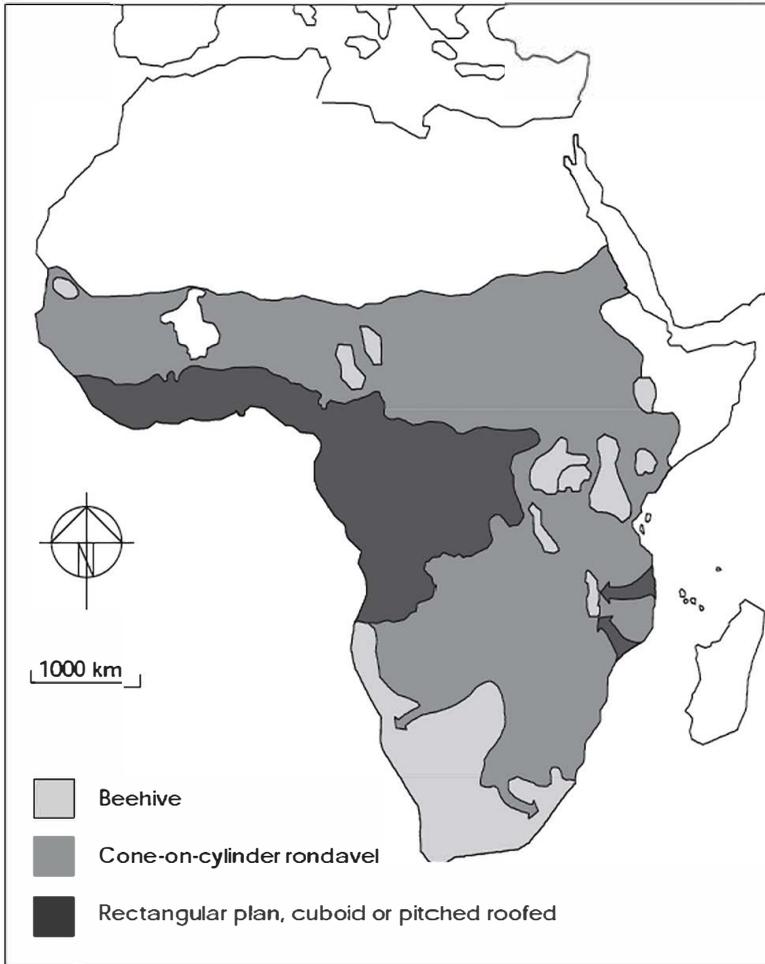Source: McEvedy, 1995: 40

Figure 2:   Distribution of styles in sub-Saharan Africa
             Source: Walton, 1956: 128

2.   Aim, method and structure

This study aims to explore the relevance of traditional African courtyard architecture to contemporary housing. Relevance in this instance is simplistically described as historic concepts and configurations that could serve as patterns for appropriate contemporary settlements. Interpretation relies on the comparative analyses of typologies, as well as an investigation of the art and science of their architecture.

The biggest advantage of courtyard housing is the ability to achieve relatively high densities with a high level of privacy and protected outdoor living space. In addition, it encourages a social mix, evidently because its introverted nature is less revealing about the socio-economic status of its occupants than Western-type extroverted houses (Schoenauer, 2000: 424). Based on these inherent characteristics, the title reflects the structure of the study:

•   Aggregation potential in order to achieve densification – typology;

•   Privacy and psychological well-being – art;

•   Climatic behaviour – science;

•   Responsiveness to social and economic needs synthesised with the above – relevance; and

•   Conclusions and recommendations for further research complete the report.

3.   Typology

Julia Robinson identified four ways to classify environments (1994: 185), as set out in Table 1. Although this study recognises the critical impact of climate, culture and economic activities on house form, the focus is on the physical properties: form and layout … the aspects that could contribute towards broad-based contemporary conceptual solutions.

Table 1:   Robinson's classification of environments

Classification	Related terminologies
Physical properties	Epistemic mode, formal or configural type
How environments are made	Genetic code
How environments are used	Functional mode
How environments are understood	Symbolic/associational mode

Referring mostly to Norberg-Schulz (1985: 26-29), at homestead scale we define typology as a classification according to plan and three-dimensional form, topology as the spatial organisation of a plan, and morphology as the articulation of a type by applying the elements of style. At settlement scale, Norberg-Schulz regards typology as the synthesis of organised space and built form. He describes topology as the way the various parts of the settlement are grouped, and morphology as the "particular local character" of an environment (1985: 26, 33-48). Baron is less ambiguous (1994: 253): "Urban morphology is every material substance, artificial or natural, that makes up the urban artifact."

If the iconic image of the Western house is the hearth and that of Mediterranean and Middle Eastern houses that of the introverted courtyard, then the prevailing image of the archetypal indigenous southern African dwelling is unquestionably that of thatched huts around a courtyard. Some observers might insist that a courtyard is tectonically a more enclosed form of open-to-sky space – as in Greek and Roman dwellings – but this study proposes that any open living space that is the focus, or organising structure, of a dwelling can typologically be classified as a courtyard. Such spaces are indeed called a 'courtyard' by many scholars (Elleh, 1997: 202; Oliver, 1987: 185; Kostof, 1995: 219; Mönnig, 1967: 200), but are generally referred to variously as lolwapa, lelapa, or commonly, just lapa, in southern Africa. This is the system of, amongst others, the Ambo, Sotho, Pedi, Tswana and Ndebele tribes.

Both Schoenauer (2000: 98) and Brower (1996: 74) recognise a relationship between the traditional houses of sub-Saharan Africa and those of the Middle East, based on the shared concept of courtyards (Figure 3). The first villages evolved in the Fertile Crescent, and like these early Middle Eastern settlements, residential patterns developed in Africa that are still in use today. Both streams probably

started with windowless one-room mud-brick dwellings. Evidence indicates that shelters in the Near East originated from round houses in c. 7000 BC, but it seems as if the room evolved into the form adopted in the Middle East in c. 3000 BC – a rectangular space with a horizontal floor and ceiling and vertical walls. Bianca proposes that the courtyard house, adopted as a prototype by Islam, was already 'fully developed' in Ur by 2000 BC (Bianca, 2000: 56).
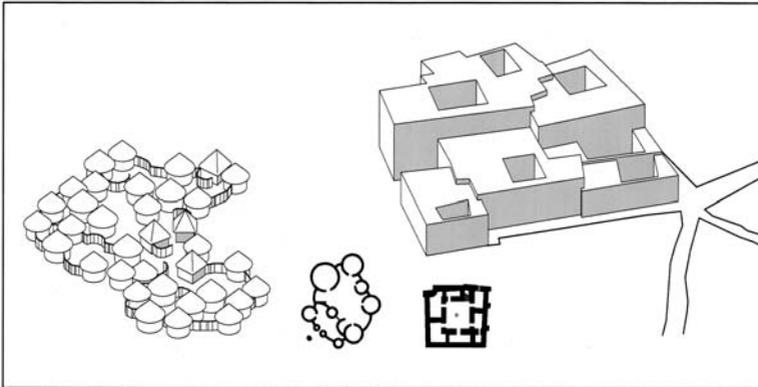

Figure 3:   Comparison of African and Arab settlement
            Source: Steyn, 2005: own drawing

Accepting this relationship offers a methodological benefit: it allows seamless comparison between purely African, Afro-Arab (Swahili) and Arab precedents – types that have co-existed along the East Coast of Africa for many centuries. The last category would include the Omani houses found in Stone Town, Zanzibar, for example, and those of North Africa, which are outside the scope of this study, but are considered to offer the purest examples of the classic courtyard house (Bianca, 2000: 81).

A simplistic typological methodology, relying on diagrammatic reduction to reveal underlying principles, is applied. This is the methodology of Bernard Leupen and his colleagues at the Faculty of Architecture at the Delft University of Technology (1997). Data on about fifty examples of dwelling types and forty of villages and towns were collected during the course of this study and drawn to scale
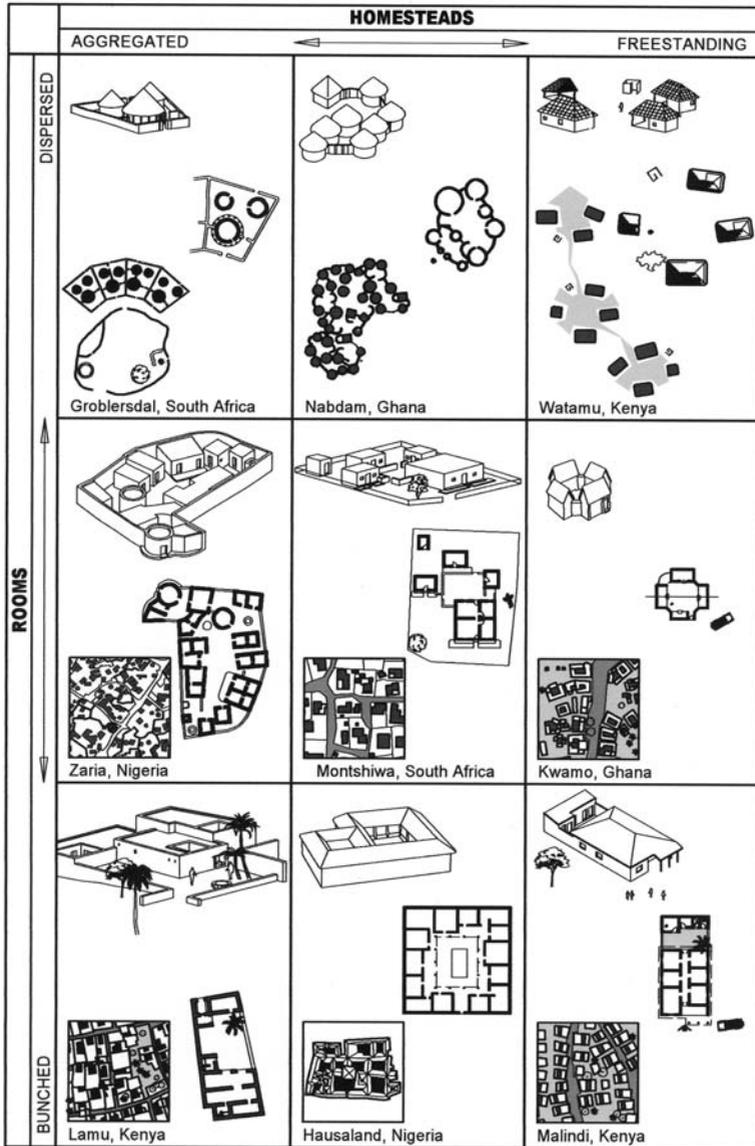
Figure 4:   Classification of types according to enclosure and density
            Source: Steyn, 2005a: own drawing

on a computer. Using a morphological matrix, the examples were graded according to the following two sets of criteria:

•   whether rooms are bunched or dispersed, in order to rate the degree of enclosure of courtyards and

•   whether homesteads are aggregated or freestanding, to determine the potential to achieve densification.

It should be noted that these examples indicate a broad trend, and that there are most certainly exceptions. The four examples at the corners of the matrix are, therefore, probably spatially the extreme forms of settlement-making found in sub-Saharan Africa (Figure 4).

The Lamu house – a tradition evidently inspired by the traditional houses of the Arabian Peninsula and the Gulf – is the most compact urban form, while the Malindi house, a vernacular derivative of the Early Swahili Lamu type, is today the most prevalent residential form along the Kenyan and Tanzanian Coast. Many Lamu houses are still owned by Patrician merchant families, but many are also now being converted into holiday homes. Most Malindi houses are owned by merchants and craftsmen working from a front room. There is also a long tradition of subletting one or more rooms off the central corridor, with all the women using the courtyard for cooking.

Matthews writes that in African homesteads

> The value systems and social hierarchies of the owners are often clearly expressed. For example, in many African villages, the layout of a family compound will clearly show how many wives the head of the family has, the status of children, and whether cattle are more important than grain (1994: 16).

That is certainly true. The Pedi village at Groblersdal shows a protective clustering facing the cattle kraal, while the open compound at Watamu is indicative of small-scale vegetable and fruit farming, supplemented with fishing.

The transitional examples are probably the most flexible types. The two Nigerian examples are especially noteworthy because of their urban nature, with the Zaria case showing the effect of rapid and unplanned urbanisation. Of special significance is the location of contemporary informal settlement at the transect of both axes. The example shown is a mud-walled house on the rural-urban edge in Montshiwa, outside Mmabatho, South Africa. It demonstrates the

robustness of vernacular rural technologies and the adaptability of indigenous forms in an urbanising situation. In the big cities over-crowding and unavailability of rural materials force squatters to adopt the ubiquitous shack technology of sheet metal over a timber frame.

4. Art and science

The 'art' and the 'science' of courtyard architecture are intrinsic-ally related – the customs and social systems that make courtyard configurations so necessary emerged from a way of looking at the world that is heavily influenced by the climate and geography of the particular place. Referring to art and architecture, Risebero writes (1982: 11) that culture in general is "dependent ultimately on the way a society earns its living", and that is inevitably determined by climate and natural resources. The categorisation below is, therefore, artificial and the divide blurred.

4.1 Art

What are the main differences between the ways Arab and African courtyards are experienced and used? Talib writes that the enclosed courtyard, as found in arid regions, "which forms the core of the house not only acts as a climatic moderator but generates a unique private lifestyle of cultural as well as spatial significance." In Arab countries, therefore, courtyard houses respond equally to cultural and climatic demands (Talib, 1984: 45). Oliver agrees (1987: 118):

> Desert settlements tend to be clustered together and urban forms of compact housing are common throughout the Middle East, as well as in many parts of the dry, savannah regions to the south of the Sahara. Muslim preference for domestic seclusion, particularly of women, plays an im-portant part in the organization of villages and towns, but the climate exerts powerful constraints on building.

Lamu houses are enigmatic. The fact that the stone houses are cli-matically uncomfortable seems to confirm Rapoport's theory that traditional societies might have ceremonial and religious needs that are more important than climatic requirements. This situation could actually result in 'anticlimatic' solutions (1969: 20-22). Early Swahili existence seems to have been in a state of very precarious equili-brium. It worked, and the houses were part of the 'magic'. They were symbols and inherent to the Swahili culture. To change them

would mean changing the entrenched values and perceptions of the society.

The African homestead consists of a scattered layout of separate huts around an open living space (Talib, 1984), and a village consists of a scattered layout of such homesteads, sometimes with an enclosure wall. While each hut is simply an enclosed room, the open spaces – courtyards – are outdoor rooms, which are the settings for daily activities. The climates of eastern and southern Africa allow year-round outdoor living, and enclosed space is used for cooking in inclement weather and sleeping only. This settlement form might seem 'haphazard' to the uninformed, but it is ecologically responsive and according to strict farming rules and cultural beliefs, which developed over centuries. Even superficial examination reveals considerable order. Units are certainly not randomly scattered, but organically arranged around a central space. Spaces and paths in an African village are hierarchically organised, from public through semi-private to private. Sleeping arrangements are also based on a strict age, gender and kinship division, and rarely require large spaces, even for the needs of extended families (Figure 5). The fundamental concept is that a hut is not a home – the whole ensemble is (Frescura, 1981: 162). In fact, Walton writes (1956: 52): "The 'lelapa', enclosed by the reed screen, was actually the real home, the hut itself serving only as sleeping quarters and store room."

The bilobial dwelling with its front and rear courtyard is a significant type (Figure 6). Generally the front courtyard is a semi-public outdoor space used for cooking, eating and entertaining, while the rear courtyard provides the family with private outdoor space (Mönnig, 1967: 208-209; Frescura, 1981: 154-157).

Marc suggests that "African villages are usually planned in a circle around a central area, a garden for everyone", where the individual psyche prefers a communal rather than isolated setting (1977: 116). But, as Crouch and Johnson write, "The courtyard in all its guises is one of the most satisfying of these gathering places" (2001: 272). Another authority adds that "The courtyard is a place of contemplation" (Polyzoides et al., 1982: 55) and Norberg-Schulz declares that it has served as the 'inner world' of the private dwelling since ancient times (1985: 98). It is clear, therefore that a courtyard has physical as well as symbolic and psychological significance.

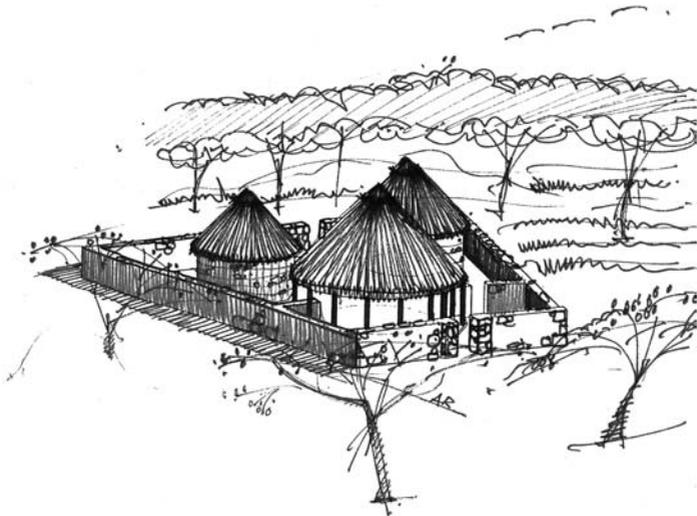Figure 5: A Tonga homestead in Zambia
Source: Roodt, 2003: own drawing

Figure 6: A Pedi bilobial homestead
Source: Roodt, 2003a: own drawing

4.2   Science

Talib suggests that both the African and Middle Eastern courtyards demonstrate ancient but lasting solutions to the problem of settlement in extremely hot climates (1984: 47) – hot-dry and hot-humid, respectively. Whereas houses in the Middle East became more complex with many rooms aggregated around courtyards, Africa retained the pattern of a number of separate single-room units around an open living space. Also, Middle Eastern houses were clustered on narrow, winding streets that ultimately created dense urban precincts, while African homesteads are only loosely related to communal paths. Both types of settlements grew organically and incrementally, but, significantly, they developed over centuries and are particularly responsive to the extreme climates in which they exist. As a matter of fact, while Rapoport suggests that climate is a modifying rather than form-determining factor (1969), Talib argues that climate, rather than culture, was initially the dominating influence in both Arab and African settlement (1984). The dense Middle Eastern settlement provides protection against the sun and dust in a hot-dry climate, while courtyards allow airflow and daylight. In hot-humid climates, however, cross-ventilation is the major concern, which the dispersed pattern of the African homestead addresses. In both climates, therefore, courtyards are not only settings for outdoor living, but are also climatic moderators.

5.   Relevance

The spread-out African settlement seems more suited to a rural environment, while the compact Middle Eastern settlement is arguably primarily an urban type. Its biggest advantage is the ability to achieve relatively high densities with a high level of privacy – very much a contemporary concern. A significant consideration is that the 'classic' courtyard houses of antiquity have changed very little since the earliest times. They are still found and inhabited all over the Mediterranean, Middle East and Africa, and in South American countries colonised by Spain; in fact, in most regions where the climate allows outdoor living.
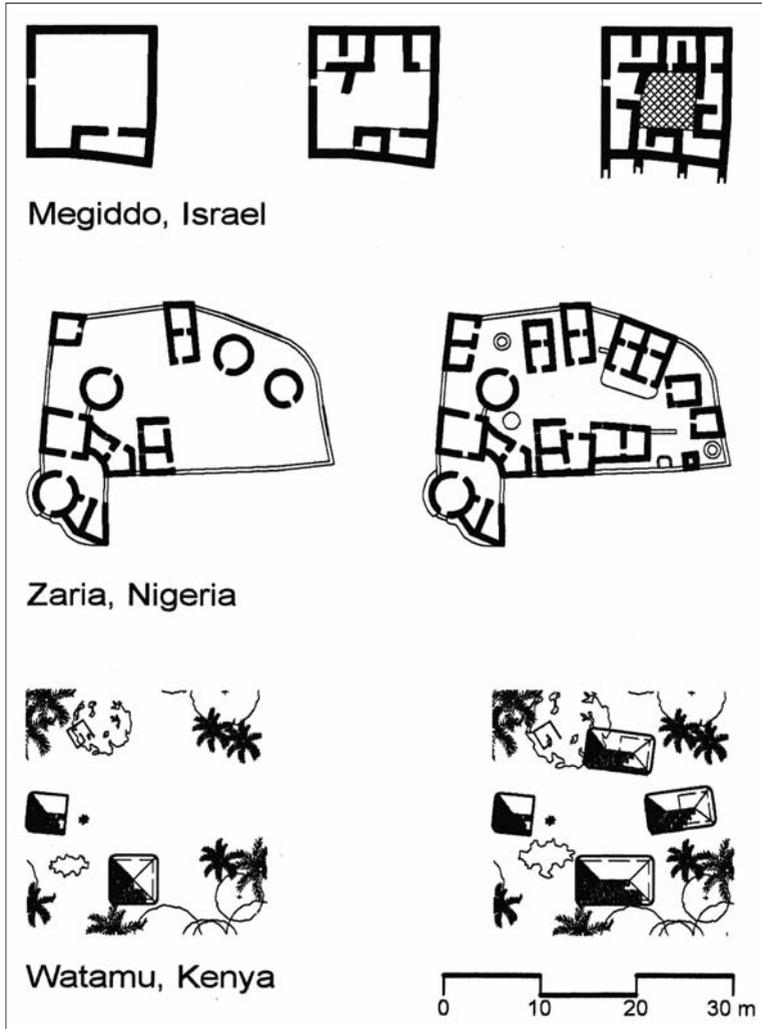
Figure 7:   The growth of different types of courtyard houses
             Source: Steyn, 2005b: own drawing

Since the traditional African courtyard dwelling is essentially a rural model, could it be reconfigured to suit contemporary urban demands or are there other appropriate models? Both options are theoretically feasible. The compounds of Zaria, Nigeria, convincingly demonstrate how a dispersed dwelling could be enclosed, compacted, aggregated and incrementally developed inside. The transition from round plan form to rectangular is noteworthy. This allows for better integration of the single units into compact houses and thus paves the way for densified urban structures (Bianca 2000: 59). As Denyer points out, in parts of Africa, for example, the Chad Basin, rural houses were traditional thatched round huts, while urban housing was cuboid. The risk of fire in a dense urban situation could, of course, explain this transition to a flat-roofed configuration (1978: 159-165). In South Africa most huts have traditionally been rondavel types (also known as cone on cylinder), but rectangular units have been built since the 1870s (Frescura, 1981: 81) and both forms are commonly found in the same homestead.

But there is another option too: adopting the 'classic' courtyard pattern (Figure 7). The characteristic irregular plan forms of sites in Zaria were probably the result of the need to create privacy in an urbanising situation by enclosing the originally rural compound with a surrounding wall. The 'classic' courtyard house also develops incrementally, but within a predetermined site, usually in a four-sided form, growing organically and incrementally into a distorted urban grid. It remains debatable whether Mapungubwe and Great Zimbabwe were large villages or small towns. The only pre-colonial urban precedent in eastern and southern Africa is, therefore, the settlements of the Swahili city-states, of which Lamu is the only surviving and functioning example. But it is inappropriately modelled after an Arab-Islamic city in a hot-dry region. Stone Town in Zanzibar, on the other hand, was rebuilt by the Omanis in the 1800s and is also a functioning historical city with a labyrinthine topology, but its layout reflects the demands of a hot-humid climate with much looser planning and wider alleys. Unique for Arab houses, windows to the street allow cross-ventilation (Figure 8).
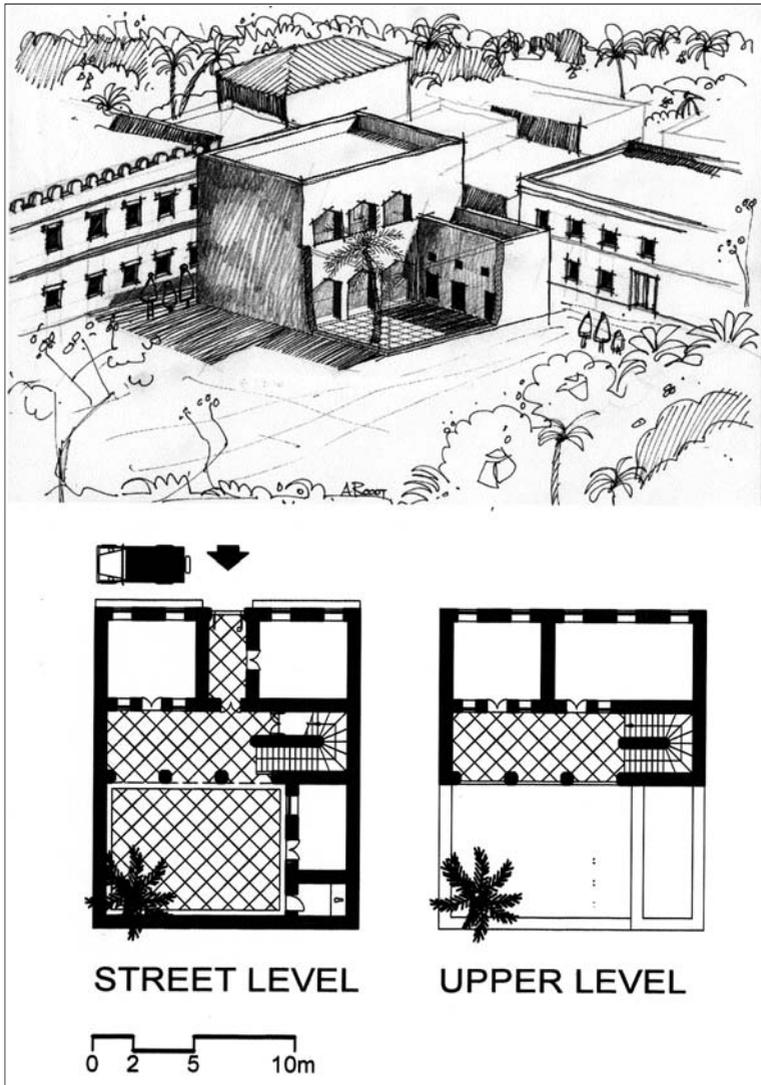
Figure 8:   A typical 19th c. Omani house in Stone Town, Zanzibar
Source: Roodt & Steyn, 2002: own drawings

Zanzibar offers the exact antithesis of urban sprawl – the neighbour-hood is eminently compact and walkable. Alleys are punctuated with small, intimate public squares. Barazas (built-in seating) allow easy socialising and conversation at street level. These, together with small, intimate squares and places where people meet in-formally for coffee, keep the Stone Town streets alive. The streets are generally only two to three metres wide and shield walls and people from direct sunshine, adding to street-level comfort during most of the day. Typical of Arab-Islamic cities, central streets form the spines for narrow alleys, which lead, labyrinth-like, into the various quarters or wards (Petherbridge 1978: 195). Called mtaa in Swahili, they allow groups with different cultural and economic backgrounds to co-exist (Allen, 1993: 224).

A comparison between the Omani and Pedi models reveals fun-damental differences but also a number of elemental similarities (Figure 9). Their typologies reveal three very similar features that seem relevant from a contemporary perspective:

• the hierarchy of spaces;

• the value of outdoor living spaces, and

• verandas.

The veranda is typologically identical to the loggia found in Omani houses. It protects against sun and rain, creates a transition between inside and outside and expands the area of an enclosed space. Apart from the veranda, other ways to provide open but roofed outdoor living space include retaining trees for shade and con-structing gazebos.

What is the relevance of all this? While squatter settlements and previous and current formal mass housing schemes have been causing massive sprawl, functioning historic towns such as Stone Town on Zanzibar Island, Tanzania, and Old Malindi, Kenya, offer appropriate and proven settlement and land-use patterns which should be seriously explored for ideas to create an African Urbanism (Figure 10). From such patterns and the synthesis of historic prece-dent and custom, a paradigm of courtyard houses could be de-veloped that would contribute towards much more compact, low-energy and socio-economically equitable neighbourhoods in the region (Figure 11).
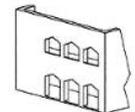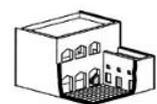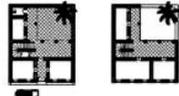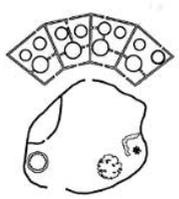
Figure 9:   A comparison between Pedi and Omani settlement models
           Source: Steyn, 2005c: own drawing

SOUTH AFRICA	Informal settlement	Model township
BUILT-UP	19	10
COURTYARD	63	67
RIGHT-OF-WAY	18	23
COMMUNAL		

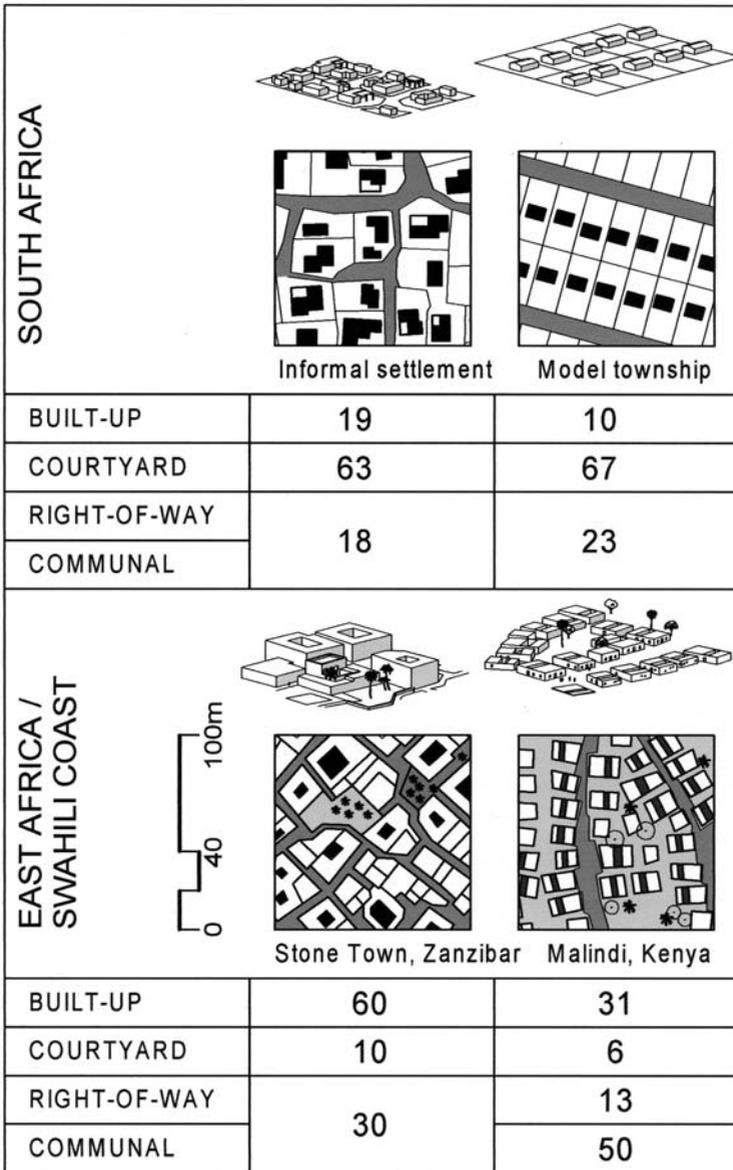| EAST AFRICA / SWAHILI COAST	Stone Town, Zanzibar	Malindi, Kenya
BUILT-UP	60	31
COURTYARD	10	6
RIGHT-OF-WAY	30	13
COMMUNAL		50

Figure 10: A comparison of land-use patterns showing percentage cover
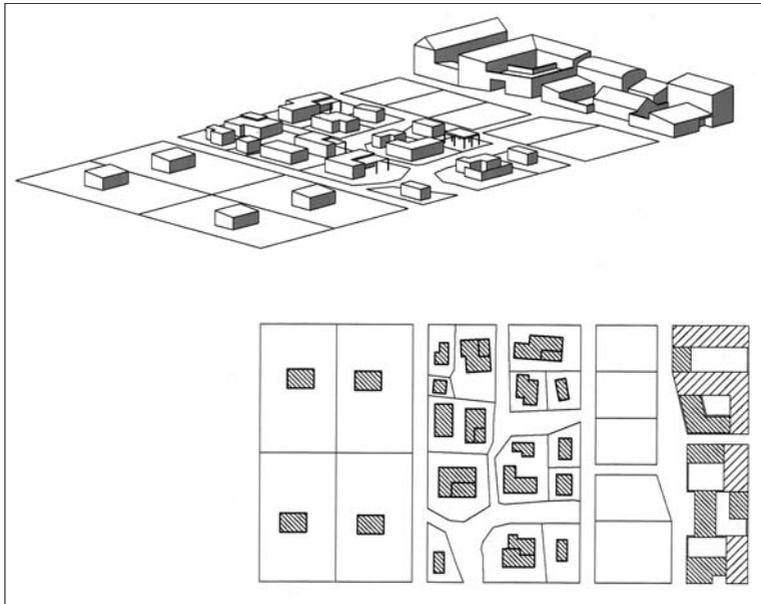Source: Steyn, 2005d: own drawing

Figure 11: A new courtyard paradigm
            Source: Steyn, 2005e: own drawing

6.   Conclusions and recommendations

This cursory review of the typology, art and science of traditional sub-Saharan dwellings seems to substantiate that many are court-yard configurations, a concept eminently relevant to current thinking on higher urban densities. Just as the Arab-Islamic Renaissance resulted in a revival of interest in traditional building forms, so the introduction of courtyard housing could reinforce the African Re-naissance with architecture with an African identity and character. The African – Afro-Arab Swahili – Middle-Eastern Omani Arab settle-ment paradigm seems to offer the historical justification, the theory and the built examples from which contemporary solutions could be evolved.

This was essentially a baseline study and focused on simplistic spatial issues. It revealed a number of themes for further investigation:

- The history of African settlement – who built what, where and when, with relationships between them and external influences, where applicable.

- The expansion of the morphological matrix into a three-dimensional model in order to include a larger number of representative examples and to also classify them in terms of style.

- The spatial hierarchy at settlement and building scales, intimacy gradient, and functional and gender separation.

- Response to climate.

- The continuum from rural compound through urban shacks to alternative forms of housing.

- Frameworks for the integration of urban structures and sub-cultures to eliminate the prevailing fragmentation.

- The nature of an appropriate African Urbanism and its coding.

The low densities of South Africa's residential areas offer tremendous opportunities for restructuring. In particular, many of the older apartheid-era townships and the more recent informal settlements contain coherent community structures and vibrant informal economies that could be enhanced by lessons learned from traditional courtyard architecture. There now is clearly a need to develop an Afrocentricity in the way we shape the built environment, which should not be ignored!

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