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Africa: Roots and Architectures

Hossam Aboufotouh, PhD



Roots and Architectures is the theme of the regional congress for the International Union of Architects-UIA, African Union of Architects-AUA, and Society of Egyptian Architects-SEA that was held at Bibliotheca Alexandrina-BA from 23 to 24 May, 2008. Thanks to Dr. Ismail Serageldin, Director, BA, for his continuous support to the architectonic activities of the SEA and his great efforts to consolidate and empower the intellectual thoughts up to the level of excellence. As director of the UIA Work Programme Architecture and Heritage, Region-V (Africa), I have been asked by Mr. Seif Al-Naga, President SEA, and Vice President, UIA and AUA, to write some words on the theme of this congress that he had proposed. The prime images that came to my mind when I heard it are the roots of plants in the field of botany and the roots of words in the field of etymology. I thought also about the great novel by Alex Haley that titled 'Roots,' the saga of an American family, and recently, we heard about the new American campaign in the field of mathematics that called "return to roots", i.e., using the early methods of math. It seems that any thing has roots even the basic sciences. But afterwards the mind started, therefore, to think about other notions that you may call them "the realms of the human roots" or whatever you like to phrase it based on your justifications. If one thought about the answer of, what the term roots might imply in our life? One might think of, and relate it to, many things, e.g., geography, water, race, type of food, language, ideology, religion, believes, way of living, profession, the national

dress, architecture, fine arts, system of writing, literature, science, and you might add other things to this array of natural and developmental realms. I tried to put them here following the hierarchy of development; let us say starting from the dawn of any civilization; and all together contribute in the formulation of the identity, the culture and the utopia of man and his society or his nation. No matter where or when he, she, or they lived or are living; and no matter if they are, or aren't, the descendents of any great civilization, or they are currently wishing, and/or they are in the road of, to establish a new one here on earth or to continue in elsewhere in our solar system, following the recent call of the known physicist "Steven Hawking" during his lecture that was the third in the NASA's 50th Anniversary lecture series. In fact, I never heard about a theme like this, i.e., linking roots with architectures. During the last three triennial periods of the UIA, we did speak about other themes, e.g., heritage conservation, architecture identity, global ideology, and heritage education. But the term "roots" never was part of any international or regional talk on architecture; a quick online search on the old endeavors, would not show the opposite of this postulation. However, one might argue, it was there all the time, in its physical interpretation, as one may see it hidden in other terms that the architects, the planners and the intellectuals use, e.g., the authentic physical patterns, the indigenous spatial dialogues, and/or the local architectural characters; denoting the physical, and some times the non-physical images of the human settlements in which the roots of societies still intact. Taking into consideration, we as human beings, have diverse backgrounds, and thus our opinions may not be the same; however, as Plato said, any "diverse" is part of, and follows the "domain of the same", i.e., he meant, it is part of the master but unified law of nature, emphasizing that in our world, the so-called the concept of entropy and disorder is an illusion, and there is always unified master roots even for the realm of opinions of the conscious minds. (Will be continued in Turin; see the invitation in page 4)

Continuity and Change: Conservation of the Old Town of Mombasa, Kenya

Mugwima Bernard Njuguna



The city of Mombasa has been for centuries a leading trading town on the East African littoral. Its old town bears an architectural legacy of historic buildings and spaces having Arabic; Indian; European and Swahili heritages. Its old town has ornately carved doors, covered balconies, narrow streets and alleyways rendering it a truly unique area. Various studies carried out by the National Museums of Kenya and its sponsors culminated in 'A Conservation Plan for the Old Town of Mombasa' in 1990 which led to its gazettement as a conservation area in April 1990, under the Antiquities and Monuments Act (now repealed). The conservation plan and the legal and institutional mechanisms notwithstanding, the Old Town Mombasa has continued to deteriorate at an alarming rate.

Due to the long span of its existence, Old Town Mombasa is a collection of historical buildings dating from the early part of the 19th century and the early part of the last century (i.e. 20th century) that combine African, Arab, Indian, and European influences. Many of the buildings still have beautifully carved doors as well as elegantly styled balconies attached to the turn-of-the last century facades. Nevertheless, due to increase in population growth and

globalization in recent years, there has been a marked deterioration of the Old Town's buildings and streets character as unchecked development of new modern idiosyncratic buildings emerges. These transformations are threatening the special character of the historical core of Old Town Mombasa. The above threats called for a need for conservation.

The gazettement of Old Town of Mombasa as a monument followed the successful completion of a conservation plan for the area. The conservation plan was a technical exercise. It established guidelines for and control on future development which would encourage growth while preserving the natural environment, important architectural features, and the historical character of the town. The conservation plan set out to: determine the permitted uses of land and buildings which will be compatible the special character of the old town;

indicate buildings, architectural features and other streetscape elements in the Old Town of Mombasa subject to protective measures; regulate with a set of bye laws building activity in order to encourage orderly development and structurally sound development and limit changes that are unsympathetic to the character of the old town; provide the planning framework for more detailed schemes to improve the infrastructure and spaces in the old town.

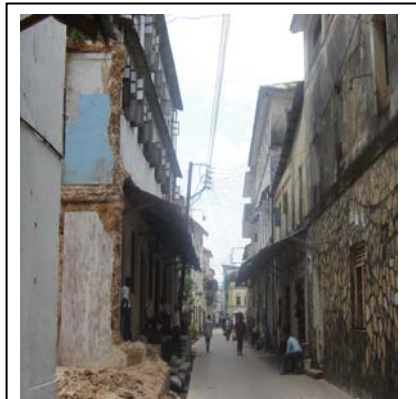
The conservation plan is a part development plan prepared under the then Land Planning Act, and the Antiquities and Monuments Act. It is prescriptive of solutions and does not promote the elements of public interest. These are health, safety, order, amenity, convenience, and general welfare of all its inhabitants well as efficiency and economy in the process of development and improvement of communications. The components of the conservation plan constituted building regulations, plans, a land use map, a development plan, a traffic map for the conservation area, along with a technical report.

The major concerns or challenges in the conservation of Old Town of Mombasa also emerge in a certain degree of

apathy of the people towards planning standards, rules, and regulations. It is clear that the community needs a sensitization campaign.



A street in Old Town of Mombasa



Dilapidated and collapsed building in Old Town of Mombasa



Imitative and discordant buildings coming up in Old Town of Mombasa

The land registration legacy and the politicization of the land question at the

coast is also another hindrance. This creates a case for absentee landlords. Further more, various dynamics of growth, coupled with limited resources is also putting enormous pressure on land use in Old Town of Mombasa. Changing living standards are compelling residents to radically alter their urban landscape. Modern built forms in Old Town of Mombasa have created new spatial patterns, leading to both visual and functional contradictions, such as inappropriate scale and colour. This offends the traditions and cultural heritage of the community. The cultural consequence of this is that the new artefacts tend to discredit then replace the local older forms and concepts by their sheer prestige of being modern. The imitative new architecture coming up in the Old Town of Mombasa is not contextual and certainly blurs the visual distinction of the growth of the historic area. Neither are some of the new buildings in these zones, which are be forced into old moulds that are not always appropriate to the functional requirements of today's buildings. The result is that the city silhouette and its social fabric are continuously being undermined.

Lack of a comprehensive legal and custodial agency has made the task of managing Old Town of Mombasa difficult, if not impossible. The legal and administrative measures in place are intended to protect the remaining buildings against destructive alterations or demolition. But these protective measures, important though they are, do not take cognisance that these historic areas organic in nature. On the contrary, they simply deal with formulation of legal provisions and special building regulations for historic urban centres. The legal framework does not recognize the role played by the custodians of these cultural properties and for practical purposes they are excluded from the design process. As such the laws do not cater for the historic areas as living tissues but treat them like museum piece. The planning process adopted in the conservation of historic areas has failed to incorporate social process and emphasis has been on the technical

aspects of master planning. The elements of public interest that is health, safety, and general welfare are largely ignored.

A proposed Framework for Sustainable Urban Conservation of Old Town of Mombasa

It has already been identified that part of the reason for failures conservation efforts is lack of comprehensive custodial agency, making task of managing the Old Town difficult, if not impossible. Although the Old Town of Mombasa is gazetted as a conservation area, the gazettement does not incorporate all key elements of the historic city as well as sufficient interconnecting space to allow for comprehensive and meaningful urban design in terms of land use, transport, infrastructure, facilities and the economic base. The Old Town of Mombasa conserved zone should be large enough to capture the extent of the area needing conservation but small enough not to threaten its consideration as a special case. This essay recommends that detailed studies be undertaken to so as to work out a boundary for the conservation area that is not arbitrary as is the case today. A buffer zone would be necessary around the designated conservation area to ensure its continued sustainability.

This essay further recommends the creation of a 'Conserved Areas Development Authority (CADA) that would function within the boundaries of the defined area as a conservation area. It would have sweeping powers and should function as an independent government parastatal. It would also represent a public- private partnership and would give a voice to the local residents as well as to outside investors. The CADA:

- Would ensure the participation of the community in the identification of values in the conservation area from time as these are bound to change.
- Would have the responsibility of planning in all the historic areas.
- Would have the responsibility and authority for conserving all historic monuments.
- Would define and enforce building codes and regulations to

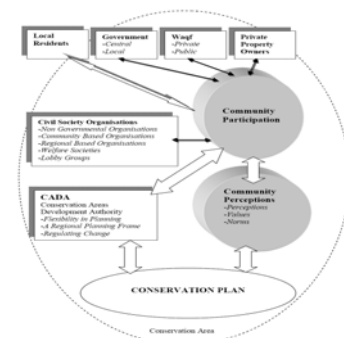
conserve the historic character of the conserved area

- Would undertake the mandatory review of all new construction within that area.
- Would undertake the bulk of the infrastructure and commercial development within the designated area.
- Would be responsible for the financial aspects of all these aspects that aim at integrated land use
- Would have financial authority to borrow and use some of these borrowing to provide working capital.
- The CADA should be audited by the government and be responsible to the legislature and executive so as to check these sweeping powers which can lead to corruption.

Assuming that CADA has been duly constituted and empowered with the legislative framework, the proposed strategies in this article can be implemented. Raising funds to undertake the physical work can be through CADA. CADA would ensure flexibility in planning; have an open ended framework that is not prescriptive in nature. Active participation of the inhabitants must be sought. The process of conservation should involve the community so that they can influence development in response to their needs and aspirations and perceptions. This will ensure that only the home-grown values are used in conservation and the planners.

The heritage area will therefore be able to provide emotional security and a sense of belonging to those who live in it. This is because it is a place with a unique urban morphology and identity. Sustainable continuity and change can be assured if CADA adopts a bottom-up approach to conservation where community participation is paramount.

Proposed Conservation Model



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The Islamic Roots: on the Hidden Grids of the Decagonal Girih Patterns

Hossam Aboulfotouh

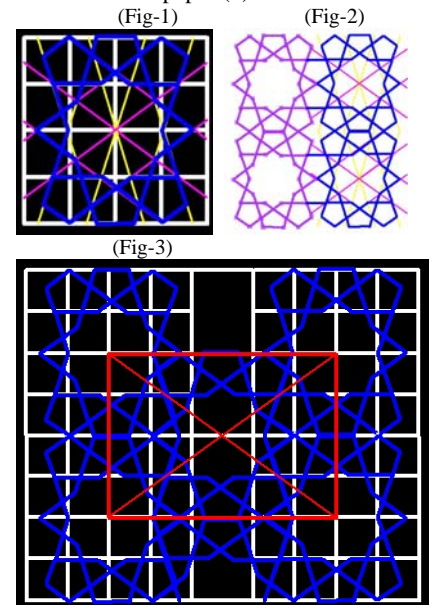


Darb-I, Imam Shrine, Asfahan, Iran

Peter J. Lu et al, in their report (1), suggest that the decagonal girih patterns on the Darb-i Imam shrine are quasi-periodic and were constructed by tessellation, using a set of five tile types. In my published letter to Science (2), I

said, contrary to the approaches of the mathematicians towards understanding the process of designing and implementing these patterns, architects design them manually; using only a scale, T-square, and various types of triangles, and produce its working drawings on 1:1 scale for the artisans. Since these patterns don't include circular curves, they draw them swiftly without using the slow-compass. For the decagonal stars, two triangles were used instead: $18^\circ/72^\circ$ and $36^\circ/54^\circ$, which are not produced today, but the triangle of various angles is an alternative. To draw a decagonal-star (fig.1), if x is the radius of its inner circle that the ten sides of the inner decagon are its tangents, we draw a square that its side equals $4x$, and draw the perpendicular grid $4x*4x$ inside it. Using the triangle $18^\circ/72^\circ$, and starting from the "center of the square", we draw the second but inclined grid on x intervals, and its tilt equals 72° on both sides. Similarly, using the triangle $36^\circ/54^\circ$, we draw the third but inclined grid on x intervals, and its tilt equals 36° on both sides. Then, we can observe the perimeters of the decagonal-star and its surroundings, i.e., one of the multiple design outputs of the three hidden-grids. If we repeat the $4x*4x$ unit vertically, we produce a vertical strip of repeated stars, every $4x$. On the horizontal direction there are various options. While the horizontal grid repeats on $4x$ intervals, the vertical grid may follow various continuous rhythms, e.g., $4x-1.5x-4x-1.5x$ or $1.4x-2x-1.4x-2x-1.4x$. The rhythm $4x-1.5x$ generates a fifth decagonal-star in the middle of each four stars, creating the stagger-shape (fig.3), within the repeating thematic-unit of $8x*11x$. The rhythm $1.4x-2x$ generates the grid-shape (fig.2) and the repeating thematic-unit of $4x*3.4x$. The shown girih patterns are small portions of repeated thematic-units that its vertical but hidden grid-sides were rotated, inclined, and/or located outside the domains of the design-motifs, and the inner-grids were subdivided in order to design the second and third level of inner-details. Therefore, designing and implementing these patterns without tessellation were and still are not difficult tasks; and architecturally the term quasi-periodic is valid only within

the hidden domain of the thematic-unit of the decagonal girih patterns. See Aboulfotouh's paper (3).



References:

- 1- Lu and Steinhart (23 February 2007) Decagonal and Quasi-Crystalline Tilings in Medieval Islamic Architecture [\[Abstract\]](#)
- 2- Hossam M. K. Aboulfotouh (17 April 2007) The Hidden Grids of the Decagonal Girih Patterns <http://www.sciencemag.org/cgi/eletters/315/5815/1106>
- 3- [Paper on: Retrieving the Design Method of the Islamic Decagonal Girih Patterns](#)

Invitation: UIA XXIII Congress, Turin 2008

To attend the UIA WP Architecture & Heritage-RV's Seminar on "Africa: Roots & Architecture" in Madrid Hall on Monday 30th' June 2008: (9:00-11:00 AM)

- Chairperson: Dipl. Arch. / Seif Allah Alnaga - UIA VP RV. (15 minutes)
 Speaker 1: Dr. Arch. / Hossam Aboulfotouh Director, UIA WPAHR-V (15 minutes)
 Speaker 2: Arch. / Leon Jacques OTRO (Cote' de Ivoire). (15 minutes)
 Speaker 3: Arch. / Hechem Meehdi (Tunisia) - COAT Vice President. (15 minutes)
 Speaker 4: Prof. / Jean Bosco Todjinou (BENIN) - AUA Council Member. (15 minutes)
 Key N.Speaker 5: Prof. / Tarek Naga (USA / Egypt) - UIA RV Scientific Committee. (30 minutes)
 Commentator: Prof. Dr. / Ali Raafat - Cairo University. (15 minutes)