Spatial changes and urban dynamics in Tuti Island

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Spatial changes and urban dynamics in Tuti Island

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Abstract

The objective of this article is to identify the key spatial, environmental and socio-economical challenges facing Tuti Island and to consider them in the context of past, present and future planning policies.

The methodology underlines this article is of two folds; 1) critical literature review of both published and unpublished literature related to Tuti Island; 2) and in-depth interviews with local citizens, public officials. The interviews designed to explore their concerns regarding current planning challenges and their proposals for addressing them. Information from local and international literature has been used to contextualize the findings.

This paper revealed that there is a territorial fragmentation and massive decrease of fertile agriculture land in Tuti Island. The latter observation is associated with that peoples became less attached to their homeland and therefore loosing their original identity.

This article also found that both the Government and private investors see Tuti as a crossroad and potential investment place. Local inhabitants on the other hand consider Tuti as their own inheritances. Such outlook generated a difficulty of integrating the newcomers in the very homogeneous community. In addition, planning attempts undertaken by both public sector and private investors focuses more on physical planning, while citizens’ proposal focuses on policymaking.

This article concludes by arguing that a hybrid, deliberative and communicative planning approach is the best option if Tuti urban future is hoped to be sustainable.

Keywords:
Tuti Island, Spatial Planning, Urban dynamics. Urban transformation,

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Urban planners, anthropologists, sociologists, geographers and historians have argued that urban transformation and contemporary urban settlement and social dynamics are the product of a long evolutionary process. Tuti Island is not an exception, as it displays numerous similarities to the general trends of urban transformation, but with specific, yet, contextually sensitive parameters that recognizes the interaction between the unique social structure of the island and the diverse forces and functions that shapes the culture and the spaces in Tuti. Urban changes and challenges observed in Tuti Island are thus a product of several intertwining factors that bids at various levels and scales to shape the future of this unique Island. Therefore, the objective of this article is to identify the key spatial, environmental and socio-economical challenges facing Tuti Island and to consider them in the context of past, present and future planning policies. Nonetheless, this article remains exploratory rather than critical. In this sense, it focuses more on documenting the recent challenges faced by Tuti rather than trying to critically evaluate the reasoning behind these challenges.

1 Introduction to Tuti Island

Tuti is an Island at the confluence of the White Nile and the Blue Nile in Khartoum city, directly opposite the northern side of the city of Khartoum, the capital of the Sudan. It can be described as a rural “eye” in the center of Khartoum conurbation (Davies, 1994). The Island is thus though at the center of Khartoum city, yet, its not part of it. This feature makes it unique and generates the island exceptional identity to the extended to be named as a “Surprising Place” (Ibrahim & Davies, 1991). While there is no clear evidences of the dates in which Tuti was inhabited, (Arkle, 1961) Argues that the island is the first settlement in the capital region and it was established in 1840. By that time, none of the three towns that compose the capital region was even existed. Several studies tried to investigate about the original settler in Tuti Island (See Merghani and Yousif Fadl ), yet, most of these studies agree that the Island seems to have been historically occupied by Mahas people from Nubia.

The total area of the Island in 2012 is about 472.3 Hectare. Tuti is generally flat terrain with gentle slope towards the edges. The southeast part is slightly lower that the other parts, thus it is frequently covered with yearly floods.

Geographically it consists of village (locally named as Hilla) in the center of the island surrounded by vast agricultural land named as “ El-Fada” or “ El-sawagi (Singular Sagiya)” . The latter is originally divided into 88 farms to which more than 8 of them disappeared now due to flooding and soil erosion. Tuti is now divided into three-administrative area named as Tuti North, Tuti South and Tuti Central. Within this three Geo-settings, the Island is divided into five neighborhoods named as; 1) “Shawageer” ; 2 ) Neighborhood; ; 3) Shukurtab Neighborhood; 4) Al-Sara neighborhood; 5) Al-agalim, regions neighborhood.

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3 Arkell (1949) suggested that the earliest settlers might have been the shadowy Anaj group of fishers and hunters.
4 Plots, houses number or ownership records of the houses does not exist in Tuti
5 Sagiya is a farm land that is irrigated by traditional methods of irrigations (Water Wheel)
Unlike the urban village of Tuti island, now named as old Tuti, Most of the Island agricultural land is owned by freehold ownership. Old Tuti is generally considered as a village, thus, though it is registered as one spatial entity, locals living within that boundary have no ownership documents (a part from the customary ownership named as Hiyaza)

2 Spatial structure of the island

2.1 Physical structures of the island

Tuti is generally divided in to three distinct urban structures or fabric named as

a) Old Tuti, which is the traditional old settlements of Tuti. This area has a distinct urban structure of a very narrow roads and a high density of population. Recently this area is witnessing large improvement and rebuilding process by its inhabitant of which most of them inherited the place from their ancestors.

b) Central Tuti: this area is generally built on top of what is used to be a farmlands, it is characterized by having slightly wider roads that have a linear pattern.

c) The farm land of Tuti that represents what is left from the original farms in Tuti. Most of these farms are now less productive and the workers are from outside Tuti, notably from the west of the country share production with original landowners, in some cases they rent the land seasonally.
Each one of the former divisions has its own legal geographical, spatial and topographical settings Table 1 explains the spatial differences among three different typologies of streets observed in the island.

![Diagram of Tuti Divisions](image)

*Figure 3 The three Divisions of Tuti, A represents old Tuti, B shows central Tuti and C defines the farmland*

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Zone A</th>
<th>Zone B</th>
<th>Zone C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Street Pattern</strong></td>
<td>Irregular Street Pattern</td>
<td>Linear street Pattern West of Tuti Following Farmland morphological Pattern</td>
<td>Mixture of linear and check board pattern east and southeast of the island</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type of streets</strong></td>
<td>Narrow yet irregular pattern generally between 0.80 to 2.50 m wide</td>
<td>Linear street pattern vary between 2.5 to 5.0 m wide</td>
<td>Wide roads that are interconnected with the first two patterns</td>
</tr>
<tr>
<td><strong>Main Users of the street</strong></td>
<td>Mainly Pedestrians with few Rickshaws</td>
<td>Pedestrians, Rickshaws, Cart, small vehicles</td>
<td>Mostly vehicular traffic, carts, rickshaws and pedestrians</td>
</tr>
<tr>
<td><strong>Block structure</strong></td>
<td>Very small block that has a deep back and small elevation line. These building are generally having small inner yard. No room for parking cars inside this typology.</td>
<td>Slightly bigger plots. With a wide frontage and a front yard. There is quite small room for car parking in the front yard.</td>
<td>Plot sizes are large with a wide frontage that allows for several commercial activities. A single family generally occupies houses in this typology. The building typology is generally a house with affront yard</td>
</tr>
</tbody>
</table>

*Table 1 urban character of the island*

Source: Abdeltawab
3 Social structure of Tuti Island

The population in Tuti Island are mostly from Mahas tribe and its descendants. The household structure of Tuti Island is relatively high as compared to that of Khartoum and Sudan at large. For instance, Hassan, 2002 states that the majority of Tutian households have between 5-7 members. The majority of these families lives in extended family composition in which two or three families share the same house.

Ethnic group endogamy in Tuti Island is quite high, the Island records about 88 percent of all marriages within the ethnic group (Lobban, RA, 1979). Many newcomers to the island report that they don't feel welcomed by local residents. Yet, Tutians denies such claims 6.

In viewing the social networks of Tuti Island Tutians are very much connected to their counter parts of Mahas tribe resides in Burri in Khartoum, Hilat Hamad and Hilat Khogali in Khartoum North.

4 Economic Structure of the Island

While most of Tuti population used to work in agriculture and farming in 1963 during which Tuti sustained 80% of Khartoum’s vegetables needs and citrus fruits, the recent social changes have contributed to massive job change. In 2002, less than 10% of Tuti population works in agriculture.

5 Tuti in Khartoum’s Previous Master Plans

5.1 Doxiadis Plan of 1959

Planned by the Greek planners Doxiadis, this plan focused on the three town of the capital region. In this plan, Tuti was considered as a recreation area for the whole capital region that is connected to other

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6 In a workshop organized by Coimbra Groups and University of Khartoum in Jan. 2014, Tuti’s Community leaders denies any allegations of being not open to outside community.
recreational zones in Khartoum North, Omdurman and Khartoum. Yet, it must be noted that 1959 plan was not implemented, thus it has not placed any spatial implications on the island itself.

5.2 Regional Plan for Khartoum and Master Plan for the three Towns of 1974

The famous Italian office Meffit Consultants developed this plan. The plan focused on the regional level of the capital region with details master plans for the three towns that form the city of Khartoum. Like previous plan, Tuti was not given specific importance in this plan as it was considered in term of land uses as an agriculture land. Nonetheless, the beautification program of Khartoum city, which was associated with this plan, suggested building a viewing tower at the Nile confluence facing the island.

5.3 Khartoum Structure Plan 1991-2000

The Greek planer Doxiadis jointly with A. Moneim Mustafa and his associates develops this plan. The plan focused on the structure level of the city of Khartoum. In this plan, Tuti was also considered as a farmland. A bridge that connects Khartoum-to-Khartoum North through Tuti was also suggested by this plan.

5.4 Khartoum Structure Plan KPP5

This is the most recent plan that has been adopted in 2008. The plan has several scenarios in terms of policy or land uses to Tuti Island. Those scenarios are in section 4.1.2

<table>
<thead>
<tr>
<th>Plan</th>
<th>Area of focus (Scope)</th>
<th>Consideration for Tuti Development</th>
<th>Type of Planning Intervention (Arrangement)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doxiadis Associates plan 1959</td>
<td>The three towns of Khartoum</td>
<td>- As recreational area</td>
<td>- Policy</td>
<td>Plan was not implemented</td>
</tr>
<tr>
<td>Meffit 1974</td>
<td>Regional level and Master plan for the three towns and a beautification program for Khartoum</td>
<td>- As agriculture zone - Beautification program suggested building a viewing tower in Tuti Area</td>
<td>- Spatial (Land use)</td>
<td>-</td>
</tr>
<tr>
<td>Khartoum Structure Plan 1991-2001</td>
<td>Khartoum Region</td>
<td>- As a farm land - Bridge to Khartoum North</td>
<td>- Law</td>
<td>-</td>
</tr>
<tr>
<td>Khartoum Structure Plan (KPP5)</td>
<td>The Whole state of Khartoum</td>
<td>- A youth city - Green Houses - Cultural and tourist space - Marinas and water based transport - Bridges to Khartoum North and Omdurman</td>
<td>Yes</td>
<td>The first plan to intervene physically in Tuti</td>
</tr>
</tbody>
</table>

In brief, apart from KPP5, most of the previous Khartoum’s plan does not really stresses on the importance of the island. Tuti’s importance is also looked at as an area that could serve to solve the transportation and mobility challenges faced by the city of Khartoum without considering its very special and unique character. In this regard, the plans that have apprehensively addresses Tuti’s challenges focus on land-use issues without tackling policy and legislation problems associated.
6 Urban development challenges in the island

Similar to many Sudanese cities, Tuti Island is challenged by several social, cultural and environmental difficulties and above all spatial challenges that are triggered by its prime location, and the fertile agricultural lands. While some of these challenges are inherited as being associated with its geographical settings and social structures, others were new and mostly associated with the vast economic development and escalating urban growth in the city of Khartoum after the year 2000. For the purpose of this article, we will divide those challenges to; environmental challenges, social challenges and spatial and morphological challenges.

6.1 Environmental Challenges

Environmental challenges stimulate one of the main urban challenges in Tuti Island. While most of these challenges are directly related to the nature and pattern of human interventions and living in Tuti, some are related to the general context and urban governance of the island itself. Below are details of some of these challenges.

6.1.1 Solid waste management Garbage disposal

Like many Sudanese cities, Tuti lacks a decent system of solid waste management. This challenged is believed to have been aggravated by several factors includes but not limited to

a) The spatial organization of the street pattern that is too narrow in some areas, which will not allow for garbage trucks entry.

b) The continuous ignorance of public authorities to Tuti Island, in which the community itself introduced most of the public services and infrastructure.

c) Community attachment to the land is decreasing creating a challenge of people become less conscious and to the importance of having a cleaner Tuti.

d) Being an island had also contributed to this problem, yet, the bridge inauguration in 2006 has eased this challenge.

Figure 5 solid waste management challenges in Tuti

Wastewater disposal is also a major challenge observed in Tuti. 73% of the island population uses Septic tank as solid-waste disposal system. A minority of about 8% of the island population also uses Soak away (master report 2013). Bearing in mind the low level of ground water in the island, the risk of ground water pollution and contamination is quite evident.
6.1.2 Flora and fauna

Urbanization has substantial and multiple influences on biological communities. Tuti is not an exception. Luckily, enough Tuti was considered as one of the richest areas in the capital region in terms of flora and fauna. A recent study on the flora in Tuti island suggested that the island is favored with rich vegetation content (Abdelmageed, 2008). In Tuti Island, the flora is much more diverse and complex, containing variable trees, shrubs, grasses and herbs. This difference implies that Tuti have a wider range of microhabitats for different species of birds and hence the higher species richness. Because vegetation cover is known to have a strong influence on the fauna (Scott Mills et al., 1989), another study found that the bird diversity at Tuti vary following the habitat difference (Salah & Idris, 2013). The vegetation coverage of the area is threatened by several human activities including overgrazing and agriculture, change of land use in favor of built forms aggravated by the bridge erection and increasing population (Eltayeb et al. 2012) (Abdelmageed, 2008). In this regard, Eltayeb, 2012 documents a decrease in number of the tree (horticulture) from 36.934 in 1960-1969 to about 12.536 between 1990-2002. That is about 30% decrease of vegetation cover in about 30 years time.

6.1.3 Soil erosion

Tuti has always been suffering from extreme floods as well as soil erosion. While the former has been historically recorded as a major challenge in the island, the latter, until recently was never been recorded and traced. So far, soil erosion is responsible of losing about 11 farms (Sagiya) from the Northeast side of the island. This area is estimated 84 hectare (200 Feddan). Yet, the Nile has given back almost the same area due to sedimentation in the Southeast side. A recent report by UNESCO Chair of water resources recorded three pattern related to soil erosion and sedimentation in Tuti Island (source). The report divided the island into three distinct zones (Figure 6); 1) Zone A in which an extremes level of soil erosion is happening.; 2) Zone B which shows a high level of sedimentation in the island and Zone C which is Recent, urban development project along the riverside, i.e. Mehsrib housing project, Mek-Nimier bridge and the new extension to the Nile avenue are believed to have contributed to aggravates the problem of soil erosion by narrowing the blue Nile runoff, and therefore increase its flow speed.
Tuti suffers from frequent floods occurs during the rainy seasons (June -October). The vast urban agriculture areas boarding the riverside though act as flood control zones that absorbs and delay floodwater progress, Most of those areas are prone to both sedimentation and soil erosion. In this regard, soil erosion in Tuti Island is responsible of loosing about 11 farms out of the original 88 farms that constitutes Tuti farmland.

6.2 Urbanization and Spatial challenges

Urbanization trends in the Island are rapidly increasing, yet, it comes at the expenses of the fertile agriculture land in the area. For instance, in 1910 the inhabited area in Tuti was restricted to the old center of Tuti. In 2012, the invasion of the agriculture land by housing activities contributed to the loss of and area estimated as equal to almost 98 Hectare. That is almost more than one quarter of the very fertile land in the island. Island population on the other hand growth from some 5851 inhabitant in 1956 to 23039 inhabitant in 2010. From 2002 to 2010 the population had nearly double as tremendous population increase is observed. This phenomenon was associated with a massive decrease of the fertile agriculture land associated with households. For instance, in the 50th land allocated to each family was about eight Feddan. That figure drops in 2002 to less than one Feddan. Considering the high number of household observed in Tuti (average is 7 inhabitants/household) it is obvious that the agriculture land can not be efficiently utilized with all household member and the community at large work together to utilize it.
Table 3 Urban Changes in Tuti Island from 1910 to 2012 based on Aerial Photography

<table>
<thead>
<tr>
<th>Year</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>1910</td>
<td><img src="image1" alt="1910 Image" /></td>
</tr>
<tr>
<td>1962</td>
<td><img src="image2" alt="1962 Image" /></td>
</tr>
<tr>
<td>1975</td>
<td><img src="image3" alt="1975 Image" /></td>
</tr>
<tr>
<td>1995</td>
<td><img src="image4" alt="1995 Image" /></td>
</tr>
<tr>
<td>2012</td>
<td><img src="image5" alt="2012 Image" /></td>
</tr>
</tbody>
</table>

From 1962 to 1975 island growth was significantly towards the north part, slightly extending to the south area. The major invasion of the agriculture land happen between 1975 to 1995 as seen in Figure 7. During this period, the island growth was towards the southeast side. In 1983, about 76% of the island land was open and farm lands. This change to about 35% in 2009 subjected to soil erosion issues (Abdeltawab, 2011)

7 The Future of Tuti Island

Having a prime location and a very fertile land for both agriculture and investment, Tuti is becoming a center point for future urban development. There are three different forces bidding to shape the future of the island. These forces are; 1) Public sector and the government; 2) Private investors driven by the market forces and; 3) the local community initiatives and Tutians Technogarts. The relationship among these forces is rapidly changing from being cooperative to neutral and sometime to being hostile. Below are details of the three forces

7.1 Public Sector approach to Tuti;

The state attitude towards Tuti Island is very vague and unclear. While it sometimes supports local communities, it tends to envision Tuti as a large-scale crossroad (roundabout) that would possibly solve the traffic problems of Khartoum. The two examples that support this argument are; 1) the widening of Nile avenue project and its extension and; 2) Khartoum New Structure plan (KPP5).
7.1.1 Nile Avenue Widening project and its extension in Tuti

This project is designed by China Harbor Engineering Company\(^7\). The project is designed in two stages: 1) a long-term plan, which foresees Tuti as across road, see Figure 8, and a short-term plan. The latter focuses on completing the bridge between Tuti and Khartoum North and Tuti to Omdurman and providing a connection between these bridges through the main aces street that passes right at the heart of Tuti.

![Figure 8 Nile Avenue Widening project and its associated bridges as Planned by Harbor Engineering](image)

7.1.2 Khartoum Structure Plan (code name as KPP5)

The Khartoum Structure Plan (code name as KPP5) is generally considered as one of the plans that have thought about Tuti in slightly different way\((\text{Ali, 2014})\). Several scenarios at both policy as well as spatial arrangement were introduced to Tuti as part of this plan. Such arrangement includes but not limited to;

a) The Planning of a Corniche line along the riversides of Tuti Island. This line is suggested to be not less than 20m wide with a building coverage area of 5\% and a maximum of 3-meter height. The suggested zone consists of public parks, restaurants, kids playing areas and sailing clubs. \((\text{Meffit and Centics, 2008})\)

b) An urban park at the Nile confluence area that contains a viewing tower.

c) Planning of a low-density Garden houses.

d) The planning of the youth city that contains sport, health, socio-cultural clubs, swimming pool and amusement park.

e) Domination of cultural and tourist activities i.e. cultural clubs, theatre, libraries, and wedding halls.

f) An integrated tourist and cultural areas that serve the city of Khartoum \((\text{Meffit and Centics, 2008})\). KPP5 also proposes two water based bus station to the east and south of the island along with the completion of Tuti –Khartoum North Bridge and the erection of new bridge linking Tuti to Omdurman. Bearing in mind current planning practice and culture in Khartoum, KPP5 envisions the outer side of Tuti Island as a playground and cultural activity center for wealthy Sudanese. Replacing the Mangoes, lemon groves, and the wetland with new luxurious garden houses, recreation activities and green houses.

\(^7\) The same company that designed the Nile avenue widening project

7.2 Tuti Island Investment Company Proposal (Private Sector)

Tuti Island Investment Company develops this proposal\(^8\), which introduces radical changes to the island spatial as it assumes the island as, and empty land that has no social, cultural, but economical value as a pace. The proposal, which is shown in Figure 10, is planned includes three marinas, several hotels that border the southern side of the island (Khartoum side), and high-density residential areas. A central administrative zone and stadium were observed as part of the components suggested by this proposal. Tuti Investment Company had already started buying several lands in Tuti in preparation to implement their proposal. In fact, Abouda claims that he owned 15% of the island real-state, this will make him the biggest real-state owner in the island brining his proposal which he call as “a new Tuti” closer to reality (Sander, 2007)

\(^8\) A private company owned by a Sudanese business man named as El-fatih Abouda
7.3 Local Peoples Vision (Twata Proposals)

Local Tutians have developed several proposals by themselves to envision the future of their island. Examples includes but not limited to

a) The proposal developed by Tutians Engineers in Oman in 1990. This was actually the first proposal that was developed by the local communities. It is argued that this proposal shapes the bases of all proposals that came from the community afterwards ⁹.

b) The proposal developed jointly by Peoples Committees and local engineers

c) Eng. Abdeltawab proposal

At this point, we will present one proposal that has been developed by Abdeltawab a local engineer from Tuti. The reason for selecting this proposal is that it has gain mush attention among Tutians as well as interested practitioners and planners.

Abdeltawab proposal envisions Tuti as both a city of heritage and a tourist attraction place (Figure 11). The proposal call for revitalization of Tuti old center, develop a series of ring roads that are interconnected with radial roads originating from Tuti old center.

Regarding policy measures, this proposal calls for exempting Tutians from the fees of land conversion from agriculture to urban uses, which is generally equal to 75% of the value of the land being converted. This proposal also called for a new extension housing project for young Tutians and those who will be affected by the re-planning process. The proposal calls for the development of the farmland to support tourist activities through a joint venture projects with landowners. Last, but not least, the proposal suggested the introduction of Tuti development authority, which will be responsible of managing all urban interventions in Tuti Island as well as coordination with local residents

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8 Conclusions and recommendations

The dilemma in Tuti is expressed in several continuously changing debates. The majority of these debates are centered on: 1) Land issue and housing development that persist at the expenses of the farmland; 2) the very high value of land that is owned by relatively poor families, thus, the tendency of selling the land is very high; 3) changes on social structure and social synergy, this is aggravated by both the bridge and the low level of service allocated in Tuti, resulting in that many outsiders, i.e. people from Darfur Region, students and Ethiopian settles there.

At present, the speed of change in Tuti Island is rapidly accelerating. Factors and patterns of transformation and change are very dynamics and interchanging. It is not easy to predict or to imagine how Tuti will look like in twenty years from now, yet we hope that the challenges addressed in this article would allow planners and policy-makers to maintain the sustainability of the Island as an integral part of the capital region without Impeding Tutians rights to settle in the land of their ancestor.

In conclusion, an article such as this one raises more questions and concerns than it answers, and it is hoped that the challenges addressed here will lead to a greater understanding of the key issues of Tuti’s urban environment and the spatial challenges its facing. Yet, it must be stated that although this article had explored various elements that shape the challenges matrix in Tuti, its nature remains exploratory. Thus, we conclude by urging researchers, practitioner and policy maker to go into in-depth multi-disciplinary studies that address the challenges addressed in this article.
References


