CITIES TO BE TAMED?

Standards and alternatives in the transformation of the urban South

SECTION 4

SHIFTING PARADIGMS IN DESIGN AND PLANNING
FOCUS: CAIRO

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Section 4. Shifting paradigms in design and planning. Focus: Cairo

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Abstract Section 4

The new urban landscape which the Revolution of 2011 initiated and rendered fluid with the breaking of that age-old balance between space, society and power, has brought up a thousand considerations on how to reinvent Cairo's city planning and its contrasting "globalized" urban condition.

The impressive informal processes that led to the urban growth of recent decades, and have made of Cairo a megalopolis of 18 million inhabitants, are focused in this multidisciplinary investigation that explores the shapes and significance of this multifaceted urban space, its relations with the formal city, and the enormous contrasts it has generated between modernity and tradition, between "modernistic" and neo-liberal urban policies and a society that on its own has built its living environment, and is now claiming new urban citizenship rights and participation in urban policy-making.

The papers explore this conflicting urban landscape from different points of view: the morphology of informal settlements and the language of self-built architecture imbued with 'local knowledge' and vernacular tradition; the processes of spatial segregation and social exclusion and the informal practices of re-appropriation of public spaces; the institutional definitions of informal settlements and related policies for their up-grading; the new informal urban practices generated by the Revolution that spread in the formal city. They all share the objective of reframing Cairo's informal features and the search for innovative design and planning paradigms as well as practices in order to acknowledge and promote the City's vast marginalized areas and their communities.

Text by P. Bellaviti

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Insurgent Spatiality in Informal Cairo. Recovering Vernacular Patterns in the Contested Metropolis

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Since the 1970s, in Cairo, the mainstream planning tried to cope with growth and overcrowding by strengthening spatial control. The governmental centralization of power and resources resulted in a substantial deficit of governance. The spontaneous reaction to social polarization and segmentation of the urban space is the informal occupation or re-appropriation of the urban space, generating new relationships between the city and citizen's behavior. By exploiting bibliographical sources and morphological analysis of the informal built fabric, the paper offers a cognitive support for alternative approaches to the insurgent spatiality generated by informality, showing how the contemporary morphology and customary use of shared spaces rely on traditional patterns once underlying the historical urban layout. By integrating citizen's participation, recovering vernacular patterns can provide solutions to several issues: housing, waste management, water supply, employment and entertainment.

Keywords: Segmented city, Informal settlements, Insurgent spatiality, Vernacular tradition.

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Cairo: the Contested Metropolis

Cairo is among the most populous metropolises in the Arab world, absorbing about 40% of the Egyptian population. Over the 20th century, the urban management policies have had to face the continuous growth in population and the issues related to the huge geographical area gravitating on the Cairene conurbation. This resulted in ineffectiveness and generated severe problems (La Greca: 1993, 1996): the spread of informal housing solutions; the overcrowding in historic areas; the transformation, gentrification and deterioration of ancient urban fabrics; and the use of monuments, burial sites and marginal areas of the city (such as the Nile banks and islands) for residential purposes.

The administrative system inherited from the Mubarak epoch was hallmarked by weak decentralization and a constrained context that affected planning and financing processes. According to law, local units were fully autonomous to manage community affairs; actually, executive chiefs controlled popular Councils, while local entities and other agencies were completely subordinated administratively to central entities. Planning capacity was weak at the local level, due to the rigid budgetary system and to complex administrative structures and fiscal regulations. Community involvement was limited, due to a lack of channels of communication and to the inability of the community representatives to influence the executives. (Mve Unit of the Egyptian Environmental Policy Program, 2004). In the field of urban policies, the substantial deficit of democracy and popular participation led to an almost total centralization of power and resources and prevented citizens and their associations the access to the management of their habitat.

As a reaction to these unsolved issues, the impressive urban and demographic expansion produced a huge proliferation of informal settlements and rapid changes in the social structure, once strongly connoted by a traditional Islamic organization. The "informal city" far exceeds the official one in spatial size and population: the Zones of Spontaneous Urbanization (ZSU) cover 52.8% of the built surface and host 62% of the inhabitants of Greater Cairo Region (more than 18 million), usually middle-class (Sims, 2004). With the gradual worsening of the economic and social disparities in the Country, the tensions accumulated over time were bound to explode when an external impulse, aimed to vindicate democratic rights, had lit the fuse of rebellion. On January 25, 2011, the unique group of demonstrators who manage to occupy the central Tahrir Square started marching from Bulaq al-Dakrur, as reported in a WSJ's popular article (Levinson and Coker, 2011). The organizers chose this informal urbanization because of the greater chance to involve a huge mass of protesters.

Segmentation and Segregation

Today, Cairo appears as a juxtaposition of several smaller cities, different in urban design, economic role, cultural level and social sphere of inhabitants. We can identify three main modalities of formation of the urban fabric, characterized by the diversity of time and conditions underlying their origin (fig. 1).

The historic city results from the consolidation of urban structures over centuries. It incorporates the walled traditional city, al-Qahirah, coinciding with the urban surface represented by the *savants* in the *Description de l'Égypte* of 1798; the constellation of rural villages, which in the same period were around al-Qahirah; and the so-called City of the Dead, monumental cemeteries today informally occupied and inhabited.

The formal city includes the planned developments since 1798 until today, all linked by the western cultural matrix: the districts built in the colonial period and in previous decades; the public housing, paradigmatic of the Nasser epoch, persisting in the policy of acquisition of foreign urban models; the districts planned and realized mostly by private initiatives in the next decades.

They are complementary to public housing because of the formal similarity but with an opposite social-economic symbolism due to the high quality standards.

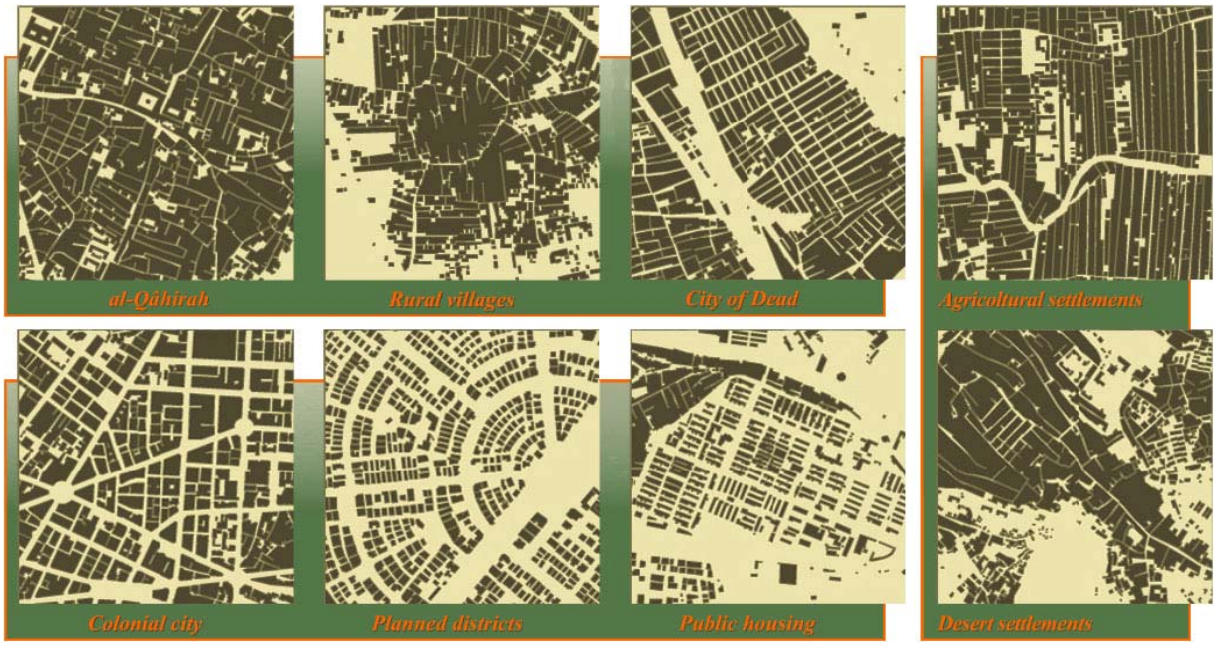

Figure 1. Urban fabrics. Different typologies belonging respectively to the historic city (above), the formal city (below) and the informal city (on the right). Source: Authors, 2006.

Finally, the informal city collects two types of ZSU: settlements on ex-agricultural land are illegal districts built on private-owned land by residents with an economic condition sufficient to build urban-type dwellings; settlements on state-owned desert areas are poorer, sometimes with a rural inspired architecture. They share common urban issues: lack of services, poor roads, high-density housing.

Urban areas with different fabrics are frequently separated by physically structured and well-recognizable boundaries. Some of them arise from the legacy of the ancient city's organization: the sub-rectangular area that encloses the historic city is still limited to the north and east by the Saladin's walls, with very few doors, and by the Citadel complex; to the west, the route of former Khalig channel, buried in 1897, is now replaced by a broad avenue for motorized vehicular traffic. The reorganization of the Azbekiyya square and the *perchées* designed by the Haussmannian *Plan General* of Pierre Grand Bey (late 19th century) pursued the intent to make permeable the ancient city on the western side, but were insufficient to integrate the old city to the new colonial city and excluded it from the more productive and representative functions.

Other barriers are been produced by the 20th century planning choices. The inflow of foreign capitals generated considerable speculation in land and building: then was the attempt to control the sprawl through contemporary international planning models. The 1970 Master Plan tried to limit the urban area through two concentric beltways and the decentralization of some residential households to alleviate population pressure. Requirements related to the transport efficiency also characterized the 1982 Master Plan, with the design of the Cairo Ring Road and several major highways cutting through the urban fabric. In the Nasser period, some social housing districts, such as 'Ain al-Sirah, and two districts to house the bureaucracy class (Mohandessin and Nasser City) have been built.

These planning decisions produced a social division, by creating separate habitats intended for different classes, with very different construction quality and service levels. However, strongest segregation is suffered by the informal settlements, whose origin and development clearly has gone beyond all expectations of the planning tools since the mid-twentieth century. ZSU therefore have occupied the sites, which primarily should be protected from the built expansion: on the west side, agricultural land beyond the Nile (Bulaq al-Dakrur); on the east side, the slopes of Mokattam (Manshiet Nasser).
Despite its central location, the district of Bulaq al-Dakrur is a relatively isolated community of over half a million inhabitants. The corridor composed by the railway line, the metro and the ancient al-Zumur channel is a relevant barrier to the pedestrian and vehicular crossing towards the neighbouring bourgeois districts, Agouza and Dokki, and to connecting with the centre (fig. 2). There are only two roads and five pedestrian bridges crossing the canal and the railway. The southern boundary of the district, marked by the King Faisal Street, offers only three entries, while the Cairo Ring Road to the west has only one exit giving access to Bulaq al-Dakrur. On the north side, the 26 of July Street is a barrier between the district and Imbaba. A metro station and two bus lines connect with the downtown, but do not penetrate into the district, that is served by private minibus and collective cabs.

Figure 2. Bulaq al-Dakrur. Access points (left) and physical boundaries.
Source: Authors, 2006.

The informal settlement of Manshiet Nasser is surrounded by the Mokattam desert hills, while on its western side, the El Nasser Road separates the district from the rest of Cairo; over a 3 km length, there are only three crossing pedestrian bridges, connecting Manshiet Nasser to the northern Mamluk cemetery of Qarafa al-Kubra. Moreover, many waste collection areas are located on this front of the settlement, contributing negatively to the image of the district and to the community segregation.
The location of the ZSU depends on the social-economic subdivision of the city: they stand on the edges of the legal city, separated by physical, natural or artificial, barriers. Furthermore, the population tends to come together in homogeneous groups according to geographic origin, economic status or religious affiliation, by meeting ancient criteria of land division. In the late 1980s, however, it was noted (El Kadi, 1988) that the fairly homogeneous class of the inhabitants with medium-low social and economic conditions mainly composed the Egyptian population.
This has resulted, to date, that the physical segregation of ZSU doesn't correspond fully to social segregation: often they have the size and characteristics of inland cities with their own social stratification, where bourgeois and illiterate people are sharing the same habitat and enjoying the same facilities.

Instead, the members belonging to the extremes of the socio-economic ladder are housed in highly segregated but small sized and exclusive areas. This is the combined effect produced by the encounter of an overall coherent population structure with settlement and planning models belonging to exogenous models. The genesis and spread of spontaneous urbanization phenomena lies outside of and in response to these models. The city appears as a flawed and distorted reflection of the settled society. This is understandable assuming that

"The segmentation of the city originates in the same moment in which decisions concerning the production of building space and allocation of fixed assets to urban land are taken, decisions to which the processes of anticipation of active realtors come" (Alfonso and Óscar, 2005).

Only relatively recently the Egyptian urban economy has really entered the liberal global market; the choices of development in specific urban sectors through private or state investments in real estate are able to trigger segmentation in the production of built space. The result is the spatial segregation and amplification of the dynamics of social differentiation and exclusion, which in recent years are intensifying (Yousry and Aboul Atta, 1997).
The road metropolitan infrastructure designed to give easier circulation to vehicular traffic is a glaring evidence of the overlap of a quite abstract planning model on the real land. Fast freeways are able to isolate entire inhabited areas, and sometimes radically transform the urban fabrics, which are the legacy of the past. The 26 of July Road axis crosses the Nile connecting the downtown to the Cairo-Alexandria Desert Road. In 1998, its implementation operated a cut in the ancient rural village of Mit Okba, an enclave absorbed by the expansion of Mohandessin. It caused the contextual demolition of nearly two acres of historic fabric and the relocation of the residents; then the split of the original settlement in two residual areas on both sides of the road, now connected by only a few pedestrian bridges (fig. 3).

Figure 3. Mit Okba. The cut opened by the 26 of July Road through the former rural village.
Source: Authors, 2006.

Segregation has another clear manifestation in the allocation and quality of collective spaces intended for fun and relax, especially parks and green spaces. In 1980s and 1990s, with the 'infitah' policy, the *Belle Époque* gardens and the Corniches of Nile have become property of luxury hotels and restaurants (Rabbat, 2004).

Nowadays, the residents of lower income districts are excluded from the free use of the few still non-built spaces (fig. 4).

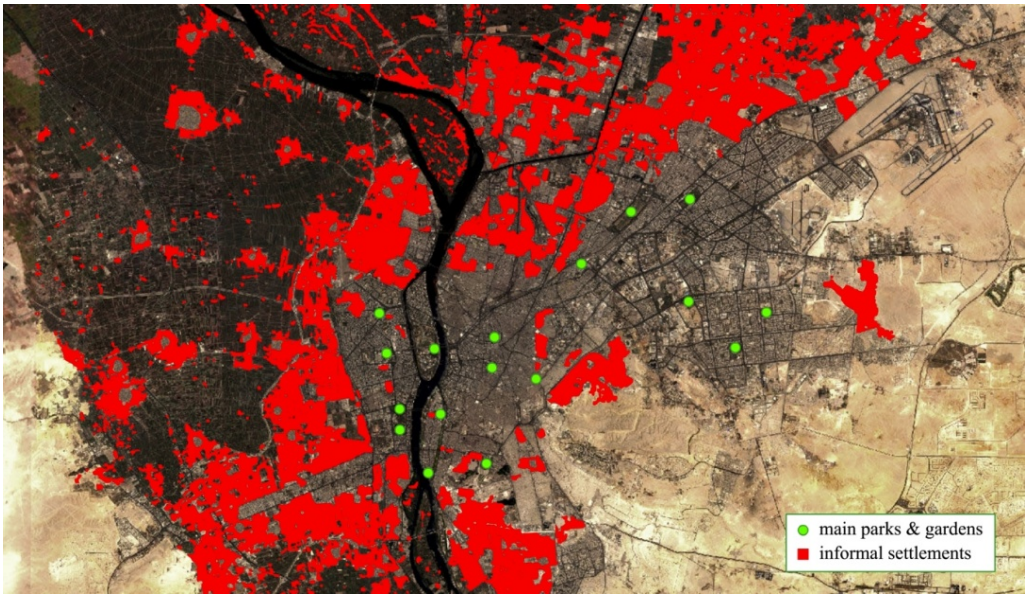

Figure 4. The location of main public parks and gardens compared to the spread of informal settlements in Cairo. Source: Authors, 2011, partially adapted from Séjourné, 2009.

Parks and public gardens, for reasons of decorum and conservation, are often fenced and assigned to specific administrative offices. They are financially supported by the proceeds of the entry tickets and inside commercials. Only 30% of them are placed in the poorest districts. While the cost of tickets affects the enjoyment by the wider public, the élites avoid mingling with the lower middle class preferring the exclusivity of clubs and private pleasure sites. Small district gardens are in poor condition or are simply closed and intended for merely ornamental purposes (Amin, 2002; al-Messiri, 2004).

Urban segmentation is the cause of a metropolitan life as a summation of patterns of use and daily routes, which each citizen, individually or together with its restricted community, carves out from the available motion range, only occasionally interacting with the rest of the population. So, a hypothetic resident in Wust al-Balad, the city centre, rarely has motivation or opportunity to visit Bulaq al-Dakrur or the City of the Dead.

Similarly, a citizen from Manshiet Nasser could never in its life have a chance to reach the Giza pyramids and mingle with the thousands of worldwide tourists who visit the site daily. This fact contributes largely to the distortion of the mutual understanding between different communities.

From a Lynchian perspective, the imposition of physical boundaries, artificial edges, forced paths and the overlapping of urban patterns alien to the local ways of settlement can indirectly alter the traditional relationship between the space and its perception.

A weakening in the 'imageability' of the urban elements is produced, and then a constrained limitation of its collective image. The possibility/need for a reference system identifying individual or community membership gradually disappears, leaving the field to the plethora of globalized signs and meanings, mainly with advertising purposes.

Re-appropriation of Urban Space

The metropolis is managed offering imperfect and simplistic solutions to very complex issues, as housing, transport, waste management, services and public spaces. Governance and participation in the formal mechanisms of metropolitan life are limited: however, while the most disadvantaged social groups are marginalized, the urban management is strongly supported by their contribution. As an example, the international companies holding the solid waste management are unable to perform the service in historical districts and suburbs, where only the co-operation with the *zabaleens'* corporations makes it possible. Despite their absurd life conditions in ghettoized living spaces, along with the enormous distances to be covered everyday, the garbage collectors offer a recycling up to 85% of the collected materials (Fahmi, 2004).

The disadvantaged social groups react to this imbalance with a set of informal spatial re-appropriations, that can be classified in two main categories depending on the kind of transformation of the urban space: structural and permanent or occasional and temporary.

Permanent transformations

In the first category, we can find changes made in order to provide housing solutions: the occupation of public land or the illegal building on private plots with former different land-use. The production of buildings follows the specific rules of the informal market, which includes the involvement of professionals specialized in lotting and construction (fig. 5).

Figure 5. Bulaq al-Dakrur. A non-built sector let see the typical concrete skeleton on the buildings' backside. Source: Authors, 2006.

The informal builders shape the urban space according to patterns derived from the self-organization of the local community and clearly related to the vernacular origin of the settlements. This is especially noticeable in the design of roadways distributing the houses; in the relationship between public and private spaces; in the spontaneous insertion of collective functions, as commercial, entertainment, or prayer places.

In the past, the Cairene road network was strongly hierarchical and specialized, different morphologies corresponding to different functions. Today, in informal areas on desert land (such as Manshiet Nasser), the roads follow the site orography sinuously and organically (fig. 6). In ZSU on ex-agricultural land (such as Bulaq al-Dakrur), the road layout has a rather firm regularity, replicating the former irrigation network (fig. 7). In both cases, the hierarchical organization persists evidently.

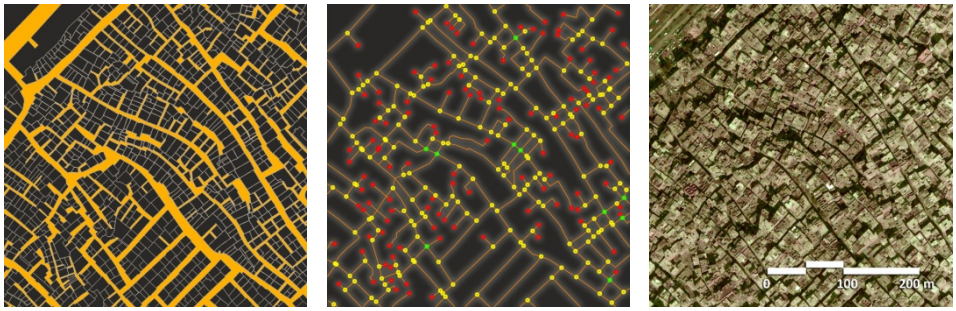

Figure 6. Manshiet Nasser. Urban fabric and street network layout. Source: Authors, 2011.

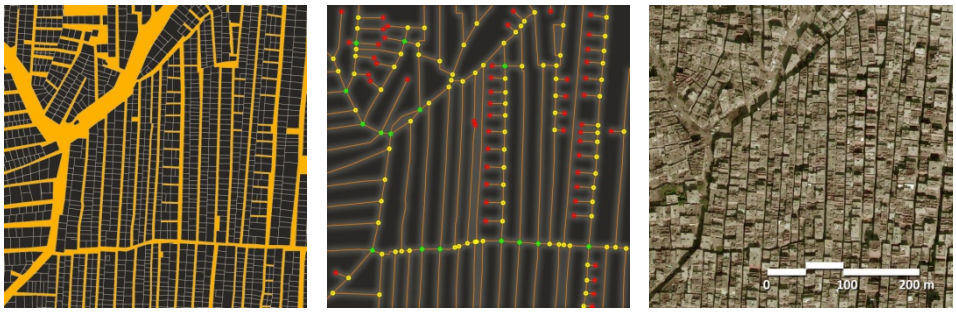

Figure 7. Bulaq al-Dakrur. Urban fabric and street network layout. Source: Authors, 2011.

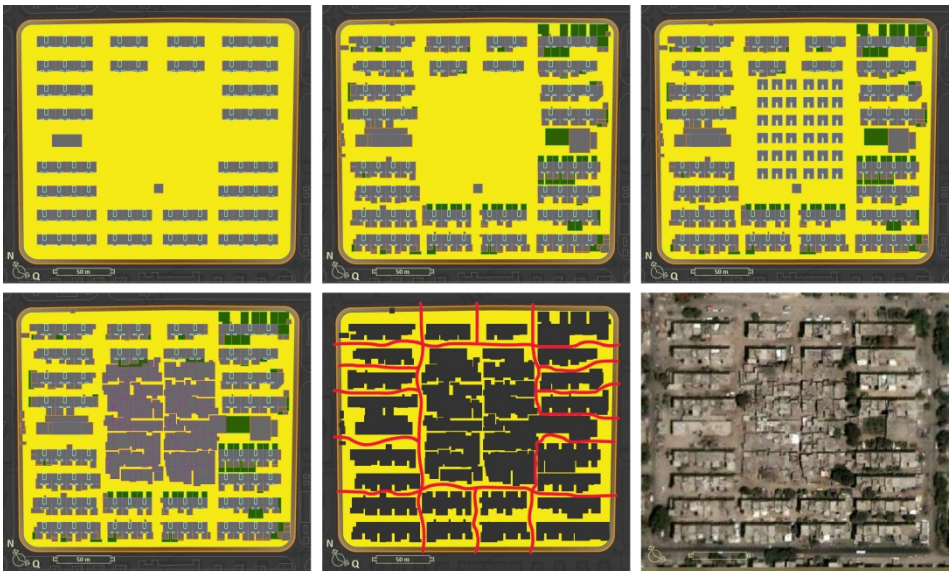

Figure 8. 'Ain al-Sirah Phases of the spontaneous process of space occupation, generating a complex paths layout. Source: Authors, 2006.

Moreover, some distinguishing features, such as the impasse or the *sqifa* (zigzagging entrance path), away from an idea of modern efficiency of the street layout, occur more frequently than in the historic city. In the colonial city and in planned districts (e.g. Downtown and 'Ain al-Sirah), the accretions added to the original buildings, hosting extension residential or commercial space, leave a residual system of inland streets.

Such twisted passages reproduce the originating mechanism of the ancient road network: a progressive land occupation based on the relationship between private property and boundary expressed by the traditional legal concept of *fina* (fig. 8).
The plan and section of the streets point out the typical shapes present in the historical area. Climate is one of the main factors determining the characteristic appearance of the vernacular urban fabric: the intensity of the solar radiation determines the narrowing of the street section respect to the height of lateral buildings, helping the almost total coverage by a wide range of shadowing devices.

Figure 9. Bulaq al-Dakrur. The urban sections show the peculiar space morphology generated by the system of secondary roads between two ranks of buildings. Source: Authors, 2006.

Today, very small street sections in Bulaq al-Dakrur; buildings with projecting upper floors in Manshiet Nasser; shields, made of recovered materials, protecting the windows and balconies in planned districts, perform the identical function (fig. 9).
The settling model is directly related also to the relationship between public and private spaces, which in the traditional city influenced the organization of the urban fabric (Raymond, 1989). Such relation is resolved in different ways determining the use of shared space, through specific architectural and urban solutions.
We can distinguish a functional distinction between a mainly public area, where the major business, cultural and religious activities are concentrated; and a more reserved area, corresponding to the interior of the traditional neighbourhood (*harat*). With a range of subtle shades, this relation is repeated within the *harat*, where inner space is subjected to a collective control and the privacy allows the customary family life. The architectural elements historically marking the transition between different areas (city gates, neighbourhoods gates, *sqifas*, inconstant road section) are replaced today by ephemeral and less encoded signs, however designed for the same protective and identifying purpose.

Spiritual, cultural, social, economic and health relationships existed between the traditiional *harat* and the city, relating the neighbourhood community life with surrounding communities first and the town community life then (al-Messiri, 1979; Berardi, 1979; Raymond, 1980). The arrangement of the contemporary urban fabrics doesn't allow urban structures physically equivalent to the *harat*. Nevertheless, there remain vernacular ways to use and to organize the local spaces borrowing their basic social characters from the traditional neighbourhood.
The hierarchical and functional subdivision of space is repeated in the organization of businesses and crafts. Caravanserais and other representative buildings hosting old mercantile activities are disappearing, often replaced by city malls that, in some ways, inherit their original function. The distribution and morphology of the historical commercial structures (*suk, wakala*, *qasaba*) are repeated, by organizing the informal economy activities along the streets of neighbourhoods according to prestige and specialty.

Figure 10. Bulaq al-Dakrur. An irregularity in the continuity of the street pattern emphasizes the presence of a little mosque, providing some outdoor space and an optical cone targeted on the loudspeaker-minaret. Source: Authors, 2006.

Another strong analogy with the fabric of the historic city lies in the role played by mosques and prayer spaces. The traditional spatial organization focused on buildings related to the cult (al-Harithy, 1993). The mosque was used to gather citizenship in prayer, to manage political and administrative issues, to impart scholastic education. The mosque continues occupying a significant position, with outdoor spaces for prayer and fountains for ablutions, and benefitting pockets and optical cones in the road network to emphasize the entrance or the minaret (Grabar, 1979) (fig. 10).
In the informal city, the mosque continues to attract and concentrate the faithful regularly, so it is still a catalyst point identifying the local community. Although limited to little surfaces and volumes, the religious sites frequently coincide with the points of greatest visibility and vitality of the districts; the combination of mosque and nearby market, typical in the historic city, is often repeated. Sometimes, far and away from the major hectic streets, the mosque and its outdoor spaces create a break in the dense built tissue, suited to relax and meditation.
In the unplanned districts, those quiet places are very important due to the unavailability of public parks and entertainment venues.

This fact triggers also the spontaneous emergence of smaller expedients intended to offer play and recreation equipment: coffee shops, political or sporting clubs, children playground hosting swings and roundabouts built with reuse materials. Other informal activities are present in pleasant places, as the Nile Corniches. Normally, the wider audience is deprived of such meaningful spaces, reduced to being a coated frame for luxury hotels lined up on the Corniches. So minimal abusive cafeterias and eateries are scattered along the riverbanks or invade also the smallest spaces, as the pedestrian outbuildings of the bridges. These improvised facilities make more pleasant the evening stroll in the large cut opened by the Nile in the compactness of the built environment, where the atmosphere is cooler and less smoggy.

Figure 11. Wooden pigeon house towers on the roofs of the informal and formal city. Source: Authors, 2006.

The erection of pigeon house towers represents a meaningful appropriation of the airspace (fig. 11). Pigeons' breeding poses a relevant additional income for many Cairene families. The towers are generally made of reuse wood, with a lattice structure supporting the breeding room that is accessed by a ladder. The practice of rearing pigeons is well established and over time the towers' builders have improved construction techniques and decorative styles. Although the towers can be found more frequently in ZSU, they often are erected informally on the roofs of historic and modern buildings. The spread of the pigeon house towers shows how a spontaneously organized activity, with the implicit collective consensus, can characterize the cityscape with encoded elements, by restoring the identity of marginalized sites.

Temporary transformations

In the category of temporary spatial appropriations, we can list the effects of behaviours adopted during special moments related to religion and neighbourhood life. During the Ramadan; the Eid ul-Adha; weddings and funerals; electoral and political events; the common area of the neighbourhood streets is occupied by dedicated structures and activities.

The Ramadan month is emblematic: urban space is thoroughly reviewed by local communities to fulfil several functions. Large green carpets, carefully kept in small warehouses, are deployed on the ground along the sidewalks or in the halls of buildings to accommodate the crowd engaged in collective prayer. Just before sunset, the common refectories for the interruption of daytime fasting are basted. Residents and passenger diners have free access. Shared spaces and premises are provided to cook meals and to store tables and chairs.

During the great festival of Eid ul-Adha, for the sheep sacrifice, the roadway is filled with benches for slaughtering, meat distribution and sale of skins. Animals' blood is collected in pools on the ground or used to mark with the blessing *Hamsa* homes, cars and aprons of children.
On those events, big colourful tents with traditional décor cover the streets; other private tents are reserved for families and groups (fig. 12). Textile structures are also used to define and indicate spaces reserved for specific activities, such as celebrating a marriage with singing and dancing or visiting relatives for a funeral. The same folkloric appearance is adopted in historic districts, in planned areas and in ZSU: spaces offered by very different urban fabrics are readjusted to patterns of ancient origin, conserving the original city image in popular imagination.

Figure 12. 'Ain al-Sirah. Celebrative tents in the streets. Source: Authors, 2006.

The official transportation network, unable to cope with the enormous sprawl of the metropolitan area, is cause of another kind of temporary appropriation. A parallel informal network of collective transport, privately managed, is required to reach anywhere in the city at any time, by using vehicles suited to each kind of trip (minibus, pick-ups, jeeps, taxis). This is particularly due to the conditions of roads in ZSU, where narrow sections, lack of pavement and steep slopes prevent access by regular bus or taxi. Generally, the unofficial bus stops are created spontaneously in high demand points, such as the outputs of the informal settlements and contact points with the public transport network. They are not indicated: but, by being commonly known and daily used, they rapidly consolidate, resulting in permanent or periodic road occupations. The final destination of the vehicles is easily recognizable by paying attention to the information shouted by the drivers' assistants. The prices are not arbitrary but regularly depend from travelled distances. This network could be seen as an evolution of the traditional system of the medieval and Ottoman guilds engaged in transporting goods and people.

Spontaneity and tradition provide options for urban management

Since the founding until the 19th century, the Cairene urban structure was made by a slow sedimentation process, adapting previous urban models to population growth and surface expansion (Raymond, 1993). The French conquest marked a turning point, starting the period of interference of colonial powers and giving way to the urban transformation, which resulted in the creation of a new city separate from and opposed to the original one.

In the 20th century, population growth and the import of exogenous cultural and economic models have given to the development dizzying acceleration (Serageldin, 2000) producing, in a hundred years, a metropolis made up of heterogeneous urban realities, placed side by side and intended to sub-integrated communities.
In this frame, the traditional urban fabric is threatened, and its progressive disappearance involves the risk of permanent destruction of behavioural patterns related to it. In the exemplary case of the *hammam*, the physical preservation difficulties and the current availability of sanitation in modern houses have limited the people attendance at public baths to the more rooted festivities (Escudié, 1992).
However, while some aspects of the traditional city life are on the brink of oblivion, informality offers to others the chance to consolidate. The re-appropriation of urban spaces generates new vernacular relationships between urban context and citizen's behaviours, by improving the everyday habitat and facing the needs of the poorest population. The links with the dynamics of the historical city are strong: the traditional and Islamic cultural matrix plays a key role, correlating the informal vernacular with ancient settling patterns more than with today's internationalized dimension of Cairo.
The intensity of these actions is likely to change morphologically spaces, which prove inappropriate because thought and designed for an alien way of life (Salama, 1994; Sibley-Behloul, 2002; Rahman, 2004). Also the planned districts, such as the downtown or the public housing, undergo a physical change of the built environment to adapt to initially unforeseen needs. Morphological transformations are accompanied by functional changes: the hawkers crowd the trade hubs between districts; shops occupy the basement and the ground floor of buildings; portions of streets are subtracted from normal use with ephemeral fencing and reserved to prayer by local users; informal markets and recreational places arise everywhere. Moreover, some elements of urban management, which in Western cities are a prerogative of the public, in Cairo are organized spontaneously on the basis of ancient customs. Finally, the urban space assumes new meanings belonging to a not recognized, but highly recognizable, system of shared rules, in many respects related to the traditional symbolic structure.
An insurgent spatiality creates new vernacular habitats: a whole new city, lying around the official one, is inhabited by thousands of people who no longer have access to a normality that has become a privilege. The informal city is self-regulated and self-organized, and appears as a Lefebvrian *contre-espace*. Here, the social identity is reaffirmed, finding new opportunities of expression. In these cases it is therefore a strong social structure that creates, in its own image, a new habitat or modifies the one in which it is embedded.
The inexistence of a formal urban management system is a constant in Cairene history. Cairo never had a public administration before the modern epoch, and the rulers were supported by the capabilities of neighbourhood communities and craft guilds gathering the whole population (Baer, 1964). Today, the formal urban management is unable to recreate the synergy of the past, continuing with the top-down transfer of globalized planning models and trying to exclude the spontaneity from the production of urban space. Despite the expansion of informality seems unstoppable, until now government bodies didn't considered the deep assessment of its potential; it contributes to wasting resources in disappointing urban programs (Ghannam, 2002) and to hindering the possibility of an integrated action by the associations. Instead, the management capacity of public agencies should join the abilities residing in the spontaneous social organization. Cairo offers many examples of NGO's aiming to enhance the action of small communities forced to act retrospectively on consolidated problems (Oldham et al., 1987; Déboulet, 1994). A phase of knowledge and involvement of citizens should support the interventions in informal urbanizations, lowering the efforts and costs necessary to improvement.

Some *zabaleen* groups were recently integrated into the official solid waste collection, providing them with special recycling plants (Dollet, 2002). This example could lead to resolve other problematic issues, such as the difficult and costly implementation of water supply networks in ZSU, by strengthening the distribution points connected to mosques and by reorganizing the work of informal water vendors. Similarly, the *sabils*, that are monumental fountains-tanks with a strong social significance (Raymond, 1979; Mostafa, 1989), could be returned to their original distribution function, through technological update and the empowerment of local communities for their management. This will appear not utopian, considering that only forty years ago, several *sabils* structures were still active and currently certain *hammams* are still used by people if their conditions permit. Effectiveness and operability depend on the possibility to disengage from the dynamics of powerful economic interests on the historic areas, and the launching of pilot projects could be important.

The inhabitants of Cairo have inherited a strong sense of community from the traditional social organization: local identity and self-management capability should be seen as a resource to face the challenge of the globalized metropolis (Paloscia, 2007). Hence, through participation, informality could acquire not only practical, but also cultural, value on which strategic guidelines can be defined for the heritage preservation and the upgrading of informal settlements.

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Can Vernacular Help the Urban Poor? Dimensions of Urban Poverty and Future Directions Using Vernacular Solutions

Marwa Dabaieh[1]

We name the urban character of slum areas urban poor. Governments demolish or evacuate those informal areas without a keen sense of dwellers demands. Is it locals' responsibility that governance is corrupted and economy is collapsing so they don't have proper services, housing and living conditions? Do we blame them for migrating to capital cities to form ad-hoc settlements that breed crime and rancour? This paper is discussing the dilemma of urban poor and how citizens can create vernacular solutions to overcome harsh living conditions and how the policy makers and governments deal with such problems as a cancer tumours or time bombs in cities urbanscape. The aim of this paper is to fill in the gap between how informal settlements dwellers' act to fulfil their needs in real life circumstances and how the policy makers react and perceive such problem from their ivory towers. The paper will reflect this argument on real situations in informal settlements in Egypt.

Keywords: Urban poor, Vernacular vs. ad-hoc, Informal settlements, Participation, Egypt.

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Introduction

The world is suffering from great housing problems. Towns and cities in developing countries are unable to provide housing, infrastructure and services in pace with their population growth (Tannerfeldt, & Ljung, 2006).

Recently research, strategies and action were conducted, planned and implemented to accommodate and cope with the demand for housing services (Nomdo & Coetzee, 2002). Egypt is one of the countries suffering from such problems.

Despite the decreased population growth rates in Egypt from 2.8 % from 1976 – 1986 to 1.99% currently (Egyptian censuses unit), they are still considered amongst the highest internationally. Egypt's population is expected to reach at least 96 million in 2020, with a 13 million increase on current population which is 83 million, which will in turn leads to the aggravation of the increased urban expansion issue and the spreading of informal settlements phenomenon.

Access to serviced urban land has been a major challenge for the Egyptian government and I claim it is not only in Egypt, the same in the majority of other developing countries in Africa and Latin America. Informal urban development and urban poor results from the combination of a range of reasons and causes. One of the main causes is economic factors in addition to lack of vision and effective rural planning policies. The rate of informal development in Egypt is higher than the rate of urban development.

It is argued that the government of Egypt's housing policy contributed in making the informal sector the predominant channel for providing shelter to the urban poor. There are two paradoxes when dealing with informal settlements in Egypt. The first is the massive growth of informal settlements (40 % of housing in Egypt is informal) which took place in a situation of oversupply of formal housing units. The second paradox is that spontaneous urbanization occurs mostly on scarce and precious agricultural land while large stretches of desert land located in the immediate vicinity of urban centers remain mostly undeveloped.

This paper is trying to meet the challenges facing informal settlements by introducing a practical approach in using the dynamic nature of vernacular thinking and building practice. It is a way attempting to apply an incremental construction process inspired from vernacular process. It is learning from vernacular research experience to solve urban poor current challenges through involving locals in a design and construction building experience. This paper is discussing an ongoing research work and is discussing what is achieved so far.

The causes of informal land development

More than two thirds of today's urban population lives in developing world, it should come as no surprise that urban poverty is growing from day to day (Musterd & Ostendorf, 1998). The main reason of informal land development is the failure of the government to provide affordable housing units that cope with people's needs and desires.

Another main reason is the centralization of services in capital cities and poor basic services in small cities, towns and villages which force people to migrate seeking for better living conditions. Logically lack of good services and basic shelter leads to illegal migration, slums areas and shanty towns. It is important for policymakers to understand the causes of the phenomenon of informal development to wisely be able to confront it, as the lack of such an understanding often leads to the formulation and implementation of public policies that end up reproducing and even worsening the phenomenon.

Unplanned growth of the built up area causes an excessive pressure on existing infrastructure and major traffic and transportation problems within mega cities.
Urban poor living in inner city slums often lack the resources to reverse the trend towards poverty, and need outside assistance to improve their environment.
Providing a decent, affordable and access to serviced lands is a mandate and in the same time a burden for governments suffering from economical problems. It is also argued that causes of informalities in cities is that informality should be understood as a particular social and historical process and as a mood of urbanization that is connected to different types of spaces and norms not as parasitic formation that is formed against formal settlements and urban regulations (Pinard & Sy, 2012, May & Reid, 2010 & Myers, 2011)

Vernacular as a tool to help urban poor

One can observe different building patterns in slum areas. Those who migrate from small towns and villages to mega cities carrying with them the vernacular building culture and habits. They try to build by themselves using available building materials. Sometimes the building product is kitsch and shanty due to lack of economical resources and sometimes the building product is creative in using the available limited resources.
The problem is always with basic urban services from sanitary and pluming those locals can't provide themselves with. When they try to use vernacular methods for such services normally it does not work in urban areas as it used to work in rural area. That causes a kind of urban illness symptoms and unhealthy living environment (Dalrymple& Opolot, 2002). As Oliver and Glassie defined Vernacular as a building product that is built by locals for locals to cope with their needs. (Oliver,1976 & Glassie,2000).Vernacular also is a building product that is harmonious with the surrounding natural environment due to using natural local materials (May & Reid 2010). If we apply such definitions in slum areas we can deduce that the source of inspiration is a non-harmonious urban grid even if it is planned by the government according to strict building rules and regulations but unfortunately it lacks a lot of human and aesthetic values.
I argue that the building product in informal settlements lacks the aesthetic values and the inspiration from the natural surrounding environment which almost does not exist in an urban setting differs than a rural setting.
One can also argue that poor living conditions and economical standard are one of the main reasons that turned the notion of establishing vernacular dwellings as an initiative from locals to solve their housing problems into slum dwellers. In rural areas locals can get the building materials with almost zero cost from the surrounding natural environment (Dabaieh, 2011) but in cities everything is at a cost. In addition to that they don't have the knowhow of the building techniques in cities and they can't afford to hire a builder and that what makes the product not only kitsch but also unsafe.
There is a potential that vernacular self-help buildings can be in a way a solution for solving the housing problems if it is regulated and supported by the government. The most expensive services the government had to provide is the basic infrastructure, however if the basic infrastructure is provided using vernacular sustainable methods that will reduce the cost. Regulating the building outcome will solve the issue of non-harmonious shanty building product. As Hamdy argues that we need to find ways of crossing boundaries between building knowledge and building know-how (Hamdy, 2011 & 2012). Moreover I claim that self-help vernacular methods can solve the weak connectivity between existing built-up area and new urban communities and go a long way towards limiting the growth of informal settlements.

Transdisciplinary in participation and vernacular mainstreaming

Dealing with urban poor challenges and problems needs a trans-disciplinary methodology to make it possible to deal with the complexity of the factors affecting housing problem. Trans-disciplinary research, as explained in the Handbook of Trans-disciplinary Research, provides a way of perceiving the complexity of problems and of investigating them from a diversity of perspectives (Hadorn & others, 2008).

It has been argued that trans-disciplinarity is an intellectual space where participants from diverse disciplines can express their views and provide input of different types (Somerville & Rapport, 2002). Lawrence & Després stated that trans-disciplinarity deals with problems which are complex and related to several disciplines; it is context-specific and implies intercommunicative action (Lawrence & Després, 2004).

As trans-disciplinarity necessarily have a participatory component applied the concept of community participation, which is broadly defined, as a social process in which groups and individuals are assisted in order to help them communicate and decide about the future of a specific issue (Gramberger, 2001). Lawrence explained that many tools can be used to assist participants including conventional simulation methods and new information technologies that enhance communication (Lawrence, 2004). Applying trans-disciplinary approach in this research will give the chance in the present study to bring together scientific research with the everyday experience of field practitioners, engineers, the local authorities, local investors, local NGOs and small local business owners together with members of the local community in informal areas.

That is to give all the chance through their participation to define problems and express their views on the future of the complex informal housing problems, which the majority of the inhabitants considered to be a major priority. The main concern is to empower local inhabitants.

Participation is an essential tool to create dialogue between the informal settlements inhabitants and the policy institutions.

This dialogue is intended to enable all concerned to express ideas about their current needs, share in problem-solving as well as articulate their future aspirations. Generally, involvement of the local community increase the possibility of developing better understanding, especially in problems related to social uses. The trans-disciplinary approach is also a useful way to put into effect the proposed vernacular construction ideas.

Using vernacular solutions

In this research project a pilot trial of building a house model started in one of the vernacular settlements in Egypt. The locals were encouraged to contribute their ideas so that the method process could incorporate their specific cultural and traditional beliefs; that is, the main concern of this phase was to include their sense of belonging to their community.

The need for the involvement of locals was especially clear both in the design and in the physical building steps, where it is necessarily to benefit from their knowledge and insure a high level of acceptance to the final house model product.

Rapoport described vernacular architecture as possessing an open-ended nature which gives it a special quality in enabling inhabitants to accept changes and make adaptations (Rapoport, 1969). The suggested approach to deal with this urban poor informal situation is to formulate vernacular traditional knowledge in terms that satisfy inhabitants' current needs and aspirations.

Such a reformulation will allow mapping the future of informal settlements expansions. Once vernacular is not seen as a static building form, but as one that is constantly evolving and reacting to changes in the communities that shaped it, then future of informal sprawl can be manageable.

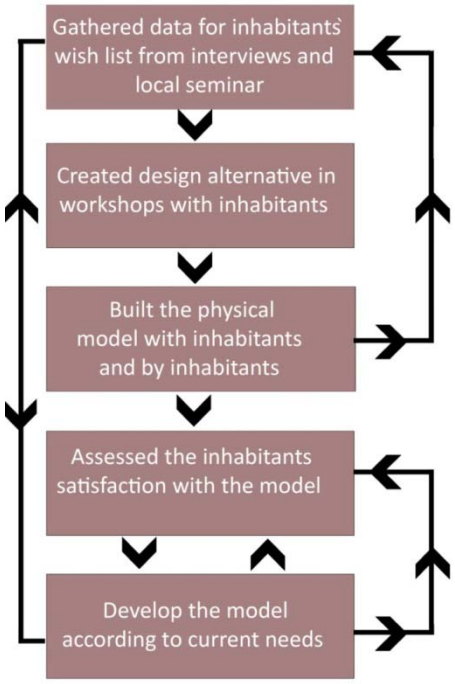

Figure1. The figure shows the process followed to reach the phase of implementation for the physical trial house model. It started with gathering information related to locals' needs and aspirations. Applying the wishes in a design alternative for a house was the next step; it was designed by the locals as well. After that came the building phase, which will be followed by the assessment of the trial model, hoping that the vernacular way of continuous developing of needs and aspirations continues in that way. Source: developed after (Dabaieh,2011).

The project started with conducting intensive walking interviews and questionnaires with sample of 30 local inhabitants in two informal settlements in Cairo. That is mainly to lay hands of problems and lack of services, reasons of migration, squatting on state owned land and investigating current housing conditions. Then the next phase done was working with locals on a design proposal for a house model. As it is still ongoing research the current phase is the building process of a model house built by locals for locals to locals as a trial for applying vernacular building methods. The fund of this building process is supported by a local NGO in one of those informal settlements.

The role of researcher in this project is mainly providing technical support. The house model idea also aimed at installing some basic low tech solutions for heating and cooling. From the site investigations natural gas for stoves appeared to be a critical issue in informal settlements together with sanitary and electricity. A Bio-gas unit will be installed to solve the problem of gas and a compost toilet method will be used to solve the sanitary one. Solar photovoltaic were thought to be used to solve the issue of electricity but the cost will not be affordable for locals if this house model idea will be replicated.

Also the house roof top will be planted with domestic plants for household use or as a source of income. Some simple environmental solutions were feasible to be applied to the building materials to solve currently faced structural problems. The technical and environmental solutions used for enhancement of traditional building technology were results of literature study together with advice from experienced locals.

Challenges in this experiment

This sort of participatory building experiment had led in many projects to frustration and annoyance among community members, as researchers gave advice about their problems and then left without showing practical solutions for how to solve them (Stokols, 2006). Sommer has pointed out that a researcher cannot tell people that they are mistaken and run away and expect them to change their actions or behaviors. He insisted on the necessity of working with communities to assist in the transformation process (Sommer, 1977).

Involvement and participation of the locals was essential since the aim was that any decisions within this model house should favor their long- term interests and should never go against them. Another aim was to give youth a central role so that they could contribute actively beside the seniors whose role was to guide the building process and share their wisdom about building procedures.

This research idea is not based on just creating and supporting a process that produces dwellings resembling traditional houses. The concept is deeper, it is meant to learn from urban poor experiences and trials. The model house was seen as a means of incorporating current informal housing needs in ways that respond to contemporary locals' demands. The aim was thus to build on the traces of the old vernacular tradition and map them onto the future of urban poor. Building a model house is based on collaboration with inhabitants. It prioritized their ideas, desires and needs and used the accumulated knowledge of many generations together with technical assistance from the researcher to solve current problems. Hinds argued in his research around this point that the approach to the past only becomes creative when the practitioners like architect are able to go into its inner meaning and content. He added that it can be dangerous when vernacular is reduced to resembling pastime architecture and just focusing on form (Hinds, 1965).

The majority of informal settlements in Egypt are built with concrete. Using concrete and other industrialized building materials cannot today be claimed to be a local available material; however, in a few years' time it might be claimed to be part of the local building tradition. Inhabitants will have developed a tradition of building with concrete, just as they used to build with local materials in their native settlements before they migrate to capital cities and start forming informal settlements. Inhabitants living in informal settlements although they know the benefits of using local materials like earth blocks but they wanted to live in houses built from industrialized materials like concrete. For them that fulfills their aspirations of a modern look for their settlements. So the choice of building materials in this house model is a real challenge because the acceptance of locals is one of the main concerns.

One could argue that the new houses built in informal areas in Egypt either with concrete or fired bricks are manifestations of current contemporary means to satisfy modern needs. I claim that this product cannot be called vernacular.

Vernacular is a continuing and sustaining intellectual building process. It is the brilliant use and adjustment of local materials. It is the urban patterns and the configuration of buildings that have emerged from the interaction with the physical environment. It is an ageless and timeless way of building. It is the fusion of culture, tradition, religion and inherited beliefs reflected in the building product.

It is the accretion of human knowledge and the continuous loop of accumulative experience of reacting with the environment. It can be concluded that it is all the above factors cannot be found in the recent building informal housing product. However in many cases some of those above mentioned factors can be seen clearly due to the influence of the rural roots of the inhabitants.

In Building without Borders the authors justified the importance of using natural local building materials and building methods in contemporary vernacular buildings rather than costly imported materials such as steel and concrete. They mentioned that local natural materials such as earth, timber and stone are easily obtained, energy efficient, low in toxicity, safe and durable (Kennedy, 2004). It is also argued that the advantage of using local material and methods is that it allows the use of existing work force of craftsmen and skilled locals and that it also reduces costs compared to procedures using imported building methods and materials (Dabaieh, 2011).

One more obstacle is that the informal settlements are either state owned landed or private lands for agriculture not for building. Encouraging locals to build for themselves using vernacular techniques will be in both cases squatting on private or state own landed. The proposed solution is a kind of collaboration with the state for putting a legal framework for this building model experiment.

Conclusions

Government in general should work at all levels to confront the phenomenon of informal urban development, aiming at least to minimize the causes and work on the serious problems resulting from them. The bureaucratic and fragmented urban management policies together with the concentration of public services and facilities in big and capital cities had encouraged land grabbing and fraudulent which caused this informality status. Civil society also had a rule to act as a pressure force on the government and propose grass root applicable solutions based on bottom up approaches. Adopting only top down approaches had proved its failure especially when it comes to forcing locals to move and re-locating them in other settlements.

People know how to build for themselves. Vernacular architecture in Egypt had proved by examples spectacular forms of architecture that had lived for centuries providing local with their needs. Informal urban poor is the symptom of ambition to better life standards that people lack in their vernacular or rural settlements. That is why they migrate and had to live in indecent and inhumane circumstances because they have access to better educational and work services in big cities. Studying the social needs is a major clue when planning or designing housing projects for urban poor.

Effective solutions are needed with full involvement of locals in all action and implementation steps to make sure that any intervention or decisions favor their needs. In the same time parallel solutions should be introduced in providing proper housing services that cope with locals social and culture concerns and economical situations which the latter is often ignored. I believe any interventions in informal housing should make a difference to peoples' livelihood and any new planned or designed projects should be affordable and equitable.

This paper is an attempt to begin thinking of the gap between political pressures on the urban poor, and their ability to build for themselves and maneuver in their everyday urban poor practices in Egypt. It also investigated the potential of approaches of using the dynamic nature of vernacular building into a form of vernacular building practice to provide a better future for informality situation in cities. The flexibility of vernacular solutions and harmonious integration with the environment can suit best with the practices of urban poor.

The paper started with can vernacular help urban poor? The question is still open and the results should be evaluated. It is a trial and experimental wok to solve the informal settlements problems. It is a trial for investigating possibilities in using vernacular thinking and building practices to provide a solution for informal housing problems. Vernacular housing tradition can be a kind of practices that can help in a better housing outcome to cope with the rapid economic and societal changes in the urban transformations in mega cities in Egypt.

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Urban Form Rehabilitation of the Informal Settlements in Egypt

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Slums is a big problem facing Egypt. This paper is focusing on the investigation of illegal constructions by individuals on legally-owned or state-owned lands, which in turn has led to the creation of informal settlements in Egypt. It analyzes the land use distribution (land use budget), the tissue, and the form; these three components reform the urban fabric and the visual form. Two approaches were adopted in response to this problem, demolishing or enhancement. The first was very coast and the second concerned only the individuals without take in consideration the built environment. This paper gives unconventional solutions to address the problem of slums in Egypt. It depends on capacity development approach. The main objective aims to improve image and legibility of informal areas and integrate it in the formal urban context. We try to identify new tools, mechanisms, policy, legislation, and visual studies in the informal settlements in Egypt.

Keywords: Informal settlements, Rehabilitation, Building capacity, Urban form, Egypt.

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Introduction

Informal development has been, and continues to be, the dominant mode of urbanization in many developing countries, including Egypt. 'In Greater Cairo, these phenomena began just after the Second World War (and later in the following decade for the rest of the country), when migration from Upper Egypt and the Delta caused housing pressures to become critical' (Sims & Sejourne, 2000 cited in Séjourné, M. 2008: 016, Shahayeb D. 2010: 28).

This phenomenon was result of increase migration of individuals from rural to urban areas seeking Job opportunities. It was of greater extent during the decade 1956-1973, and continued more rapidly following 1980. It is estimated that during the period 1956-1973 about 800 informal settlements were created in Egypt. Until 1986, statistics show that approximately 40% of the urban population lives in informal settlements. The informal settlements occupy 62% of Greater Cairo area.

The government withdrew from the housing market in the mid seventieths. The private sector provided only new luxury housing. Families with limited incomes have no choice except to build their houses as available possibilities. 'Figures about the number of informal settlements in Egypt and their populations differ significantly among different government authorities, as well as within the individual offices and ministries. Accurate and consistent data and information about informal areas in Egypt does not exist' (Sabry, S. 2010: 29).

"The latest figures include 1171 areas with 15 million people in 2007 by the Information and Decision Support Center (IDSC); 16-21 million people in 2008 by the World Bank; and 1 210 areas in 2006, up from 1174 areas in 2004, by the United Nations Development Program (UNDP) and the Ministry of Economic Development. These considerable figures seem to finally acknowledge the large-scale of informal areas" (Sabry, S. 2008: 29).

According to the final statistics of the Central Agency for Public Mobilization and Statistics in 2006, the total number of slum areas in Egypt is about 1221 areas. 'The total urban population in Egypt is about 31 million people. Slums' population is around 12 million people, about 38% out of total urban population' (census, 2008: 28-29). But in fact there are large numbers of random areas that were not included within the previous classification. Many of the Egyptian cities at all categories has huge areas grew up outside the urban formal framework. Informal settlements in some cities reached 77% of city's urban growth (Bani Mazar – El Minya). They have even reached 87% of Giza city urban expansion. Informal settlement population in cities to total city population is around 25% in Assyout and 62% in Giza.

There are several types of informal settlements in Egypt, the most common is construction on small, legally-owned land parcels or state-owned land, in areas having no formal urban plan, which is often accomplished simply by proceeding without building licenses. This type of informality has two types, Informality within or outside the formal settlements and informality within the city influence zone.

The existing informalities in Egypt resulted from various causes, among them insufficient spatial planning, old and complex legislation, lack of housing policy, bureaucracy, significant rise in property prices, and outdated public administration structure. 'We could define informal settlement as building in an area where housing is prohibited for legal reasons because it is agricultural land, State-owned land, unplanned land, land not subject to road plans, etc.' (Afify, A., 2000). The "first generation of informal settlements" grew mainly in the periphery of major cities, or close to industrial areas.

This paper is focusing on the analysis of the morphology of the informal settlements. It concentrates on the land use distribution (land use budget), the tissue, and the form; these three components reform the urban fabric and the visual form.

Main characters of informal settlements in Egypt

The most common informal settlements in Egypt are the housings which were accomplished simply by proceeding without building licenses from the local authorities. Buildings were conducted in areas having no formal urban plan. 'They lack basic infrastructure, which in many cases means no electricity or water supply, no schools, nursery schools, parks, sport installations, transportation' (Central Agency for Public Mobilization and Statistics, 2008: 9). The main steps of this process are: purchase of agricultural land, its subdivision into smaller parcels, and illegal conversion of the land use from agricultural into housing. There are architectural and urban features characterized these areas.

Urban morphology

Most of the informal settlements have begun by substandard commercial subdivision with small dimensional plots, construction on the whole plot without leaving any outer open space, Narrow streets do not achieve traffic functions or proper ventilation, Buildings are constructed with solid materials (Concrete structures and walls bearers). Some of the land owners and land entrepreneurs illegally convert their land-use from agricultural into residential simply by constructing orthogonal road networks within their territories. The small land parcels are approximately the size of 100-150 m^2 at the periphery of the cities, outside the formal urban plans. Those informal cities were built according to the customs and the collective thinking. All these informal settlement were built under the pressure of need without any prior plan or conception.

These informal settlements have some weakness points that affect the urban environment as: The streets are very narrow and not straight, most of the roads network are inaccessible by vehicles and don't provide a healthy conditions for the habitant, open space areas are rarely found, plots areas are very small, there aren't grids for areas distribution or roads network, and the land use budget is unbalanced.

There isn't any urban hierarchy at the urban or administrative level (cluster, neighborhood, and district). There is no coordinating system for the streets and no baseline information. This leads to the hard access for health services, such as fire fighting, ambulances and law enforcement personals.

In these areas, there is a great disruption of the land use budget. Residential areas are the dominant use. Proportion of the road network and open areas are extremely low. There are not areas of services, but there are some few scattered buildings. There are no areas of trade services, but there are some marginal commercial activities. The urban fabric is very compact. Most of infrastructure services are very sub-standard in terms of performance and efficiency, and some of them are not available, as sanitary drainage. These areas are deprived of all sorts of public services, schools, hospitals and social institutions. Informal settlements rely on its services at the surrounding formal areas.

The small spaces of plots made it difficult to provide basic living spaces in the houses. Room sizes and numbers do not often fit with the numbers of family members. Services spaces such as bathrooms and kitchens areas are very small and often not found. Buildings are attached on three sides by neighbouring houses and often no skylights. Very bad ventilation threatens public health and result in many diseases that spread in those areas.

Social morphology

In this underdeveloped urban environment juxtapose very different social classes. 'In these areas live segments of middle classes of government employees, doctors, engineers and lawyers who could not afford to rent apartments in planned areas since rental rates exceed their earning ability along with segments of the lower classes of street vendors, artisans and seasonal employees' (Shehayeb, D. 2010: 35).

'Hence the informal settlements start with the involved political, environmental and mostly social problems by which the administrations are confronted' (Malusardi, F. and Occhipinti, G. 2003:1).
In the most Egyptian cities there was no centralized concept to guide the development process from the top down. Urban historian Lewis Mumford describes this process in his 1961 book; the informal settlement is a growth sector. But it's more than that, it offers choice, it gives people what they want, it enables individual creativity and it is affordable. It is also simple to build and easy to use. But the problem is a decrease of housing and planning quality leads to a decrease in land and social values.
Most of buildings in these areas are private homes. Parents and their sons who marry live in separate apartments in the same house. Each area is characterized by a population almost had come from the same geographical area. Often families came successively from Upper Egypt and Delta. Their customs and traditions are often ones, but the problem is that they remain isolated from the external communities. These people still remain with their negative habits such as high school dropout rates and early marriage rates for females.
Compared to other urban areas informal settlements are highly populated and have high density and growth percentage. 'Residents of informal settlements are likely to experience poverty, ignorance, disease, negative customs and traditions, early marriages, and the effects of quickly deteriorating housing and lack of infrastructure' (Afify, M. 2000: 3).

Previous experiences in the development of slums

In the past years, the state developed some slums by a new approach in collaboration with foreign donors such as United State Aid (USAID) and German Technical Cooperative (GTZ). 'This approach relied on new concepts such as, dialogue, partnership and sustainability of urban development. This approach has been applied on several areas nationwide' (Claudio, Jr., 2002: 16). It usually focused on two issues, the individual and providing a package of basic services: clean water supply and adequate sewage disposal to improve the well-being of the community. Those experiences have succeeded, but their impact has been limited. It was difficult to apply the model based on the same mechanisms in all slums; each area has its characteristics and its own circumstances. 'Those experiences focused only on providing some services, but the urban environment remained bad and highly dense. The streets remained narrow, making it difficult to implement sewage and water supply'(Alkady J. 2009: 56).
The government, represented by the Ministry of Housing has prepared master plans for the development of some areas in Cairo such as Manshiet Nasser and Duwaiqa, two of the largest slums in Cairo, with total area of about 357 hectares. The concept of development based on two axes: the first, removing random buildings and establishing new residential communities, as well as establishing other communities in the desert next to the back area. The second axe is the upgrading areas that will not be demolished through connecting the public utilities of water, sewage, electricity and roads. 'Areas that have been removed and re-planned are very few due to the high cost. The rehabilitated areas were abundant, but the result was weak' (Saleh, M. 2008: 138).

"Many developing countries pursued the repressive 'bulldozer' eviction policy approach until researches and the international experience started to give evidences about the failures of the eradication policies, its shortcoming and the perverse effects it had on the urban poor" (Claudio, Jr. 2002: 9).

These two approaches (demolition and rehabilitation) are the main tendencies, which the Egyptian government and the international community have adopted in the development of slums.

The first was very costly and difficult to apply to many areas, and the result of the second was weak and only related to improving some of the life conditions.
What was done by the donor international organizations in addressing slums is to provide some of the life necessities. They focused on, providing a source of drinking water, paving a road, removing rubbish dumps, establishing a social services building, sports arena or establishing places to teach crafts. These aides supported the slums' communities to continue surviving, but they did not change the bad circumstance. The bad condition of urban environment is still under human acceptable level.
Slums development projects carried out by the government through demolition and rebuilding still very limited. The physical environment of these projects is acceptable, but there is a shortage in the social and economic building capacity.

Toward a new approach for capacity development of informal settlements

The creation of equitable towns and cities that provide dignity and quality of life for all inhabitants is not an option it is a necessity. It may be very difficult to improve the area after an anarchic development, then, how could we make the habitant enjoy better environmental conditions. How could we decrease the early death of dwellers in informal settlements areas due to unhealthy housing? We must detain non-conventional planning skills and participatory tools which will assist to launch meaningful actions and result oriented processes at the settlement level.
'Since the 1960s, there has been ongoing debate regarding the role that the design disciplines may play in addressing the development issues facing informal settlements of the developing world' (Lindsay, M. 2008: 12). There was a problem existing between those who see architecture and urbanism could promote development and shape social relations and who think that administering financial aid to individuals in need, development problems would resolve themselves.

"The modernists viewed the informal city as a set of disordered urban elements whose problems could be solved through application of modernist order. These schemes saw the process as black and white, problem and solution. They relied on bringing change through formal overlay of a set of spatial rules rather than any attempt to understand the existing condition" (Lindsay, M. 2008: 12).

'Studies of Christopher Alexander and Team X gave value to the systems that appeared unplanned, yet had their own order. This process began to see the 'informal' as having its own values and rules' (Lindsay, M. 2008: 4). Some commentators have argued that formal planning may actually exacerbate the problems of informal developments by imposing requirements that cannot be met.
In this part we suggest proposals for interventions that can become part of an open discussion and design process involving community. Our main goal is to put a new physical design vision for informal settlements in Egypt, The possibilities of what could be; and the idea of producing a design framework. Informal settlements were established only to provide a shelter. What we are looking for through this paper is to provide a better environment for life. 'Informal settlements could be our cities of the future' (Milles, G. (2012: 2).
The main objective aims to improve image and legibility of informal areas and integrate it in the urban context. How could we find the best way for applying the norms and standard of urban planning and urban design on the informal settlements to create a distinctive image? We need to identify new tools, mechanisms, policy, legislation, and visual studies in the informal settlements in Egypt.
It must be stressed that each informal settlement has its own special case. How to deal at the level of details varies from one region to another.

Perhaps some modification in the methodology could be made through the pilot projects. But there are some public policies that may serve as the basic foundations of capacity-building program. Each area must be divided into sub areas of intervention as the degree of diversity or consistency.
The demolishing process and changing the physical urban pattern should be kept at a minimum. Forced evictions must be avoided as much as possible and the person should have the right to choose between various alternatives for resettlement.
In a case study for reform the informal settlements Mark Lindsay define 'the practice of capacity development as a broad development framework within which pilot projects take place' (Lindsay, M. 2008: 4). We seek out a working method for urban design as a capacity building tool. Capacity-building method depends on some Progressive steps.

Promote integration with adjacent communities (Albonico,M. 2011:3).
Although the spatial proximity, there is a break in communication between slums and the planned surrounding areas. These areas are isolated islands inside and on the outskirts of cities. The first step toward rehabilitation is the integration. The isolation makes the economy of those communities fragile, because it depends at the locality only. At the beginning of reform we need a fort connection and penetration. There are physical and moral impacts of this linking. The physical impacts are, continuity of the movement system, overlapping of trading activities, and proximity of physical appearance. The moral impacts depend on soft moving process, which mean that the passenger do not feel the great gap between the urban morphology of planned and informal areas.

"In 1994, the Favela-Bairro programme emerged in Brazil. It is one of the most interesting recent examples of the designer's possible role in the capacity development process. To date it is the largest and most comprehensive squatter settlement upgrading programme in Latin America" (Lindsay, M. 2008: 16).

The first step in developing a strong network of community infrastructure will be increasing connectivity and permeability. One of the important stages of Favela Bairro programme was looking at improving connectivity with the city both physically and with its organisations and institutions. The aim is to connect informal to formal and builds community cohesion. The dweller of informal settlements have to encouraged to build as a community, a place to dwell rather than simply take shelter and survive.

Building capacity of urban form
The informal settlements have its characters and urban fabric. Our goal is not to completely remove this pattern and re-planning the areas in accordance with the principles and rules of design and ignoring existent conditions.
As stated by Fiori and Brandao, Good design and urbanism can help create 'platforms' for other social and political developments in the city. Good design for informal settlements will depend on the rebalance of land uses, creating corridors of development and anchor projects, reshaping outer spaces, and adoption of new legislation. 'In 1994, the Favela Bairro programme emerged in Brazil. The basic informal structure of the housing layout of Favela Bairro remained intact, while the focus was on collective space and infrastructure' (Lindsay, M. 2008: 8). Rebalance of land use budget: The existing land use of informal settlement is very disturbed. The recreation uses, services, and green spaces completely non-existent. Commercial activities are still in primitive like. Proportion of the road network and open spaces are much less than the standard rates, which threatens the public health. We have to change the existing uses budget through the defining of the most degraded areas and converted it into service areas or open spaces.

Such as we can decrease the residential land use and density and improve the legibility of the visual image of the urban environment. 'There are times that upgrading also means the decrease in building and population densities' (Claudio, Jr. 2002: 8)

Movement system and main corridors for recreation, movement and trade: one of the most important problems of informal settlements is the compacted fabric. Road network of informal settlements does not have a clear grading. Axes of penetration are one of the important means of rarefaction within the urban environment and improve the level of movement. More formal commercial activities should be generated within these corridors.

Most of informal settlements are not penetrated by the public transportation lines, which makes entry and exit very difficult. The lack of connection with public transport lines reduces the efficiency of these areas due to the low incomes of the population. We could create a network of transportation main axis and relying heavily at pedestrian system. The resolution of accessibility through the improvement of main roads is often sufficient to launch regularisation processes and stimulate private investments. 'The total plan addressing the entire physical/spatial restructuring of the settlement is usually ambitious, costly and not reliable due to problems in topographic accuracy' (Claudio, Jr., 2002: 17).

The roadside market has the potential to fulfil such a landmark/gateway role, but needs to feel safer and more accessible to traffic passing by. The main spines will also have the potential to introduce public buildings such as police stations, market buildings, schools, childcare facilities and transport nodes near the main road.

Reshaping of the public spaces: Open spaces are an important functional and formal part in the built environment. As it mentioned before, the public spaces non-existent in the informal settlements. The provision of public space and community infrastructure impacts upon many people and offers the possibility for broad scale community capacity development. 'Residents should be proud of their public spaces, which contribute to their feeling of collective belonging' (Tiwari cited in Lindsay, M. 2008: 28). As Fiori and Brandao state 'It is understood that if the residents have a positive image of the public spaces they use daily, a sense of pride would arise which is crucial for the community to develop' (Cited in Lindsay, M. 2008: 28). Can you imagine that an area in the south-east of Cairo called Manshiet Nasser inhabited by 500,000 people is devoid from any public open space. Open spaces are the community's collective power and encourage social integration among the residents.

In the early stages of rehabilitation, the open spaces could be provided through small plots of areas to give the people the opportunity to meet and to children to practice recreational activities. The State can buy small tracts of dilapidated buildings and turn them into open areas.

'Pendalosa says: Pavements, bicycle lanes, plazas, parks, promenades, waterfronts and public sports facilities (that) show respect for human dignity and begin at least to compensate for inequality in other realms' (Penalosa 2007 cited in Lindsay, M. 2008: 28).

Anchor projects**:** The improvements in the urban environment by opening new axes of movement, formation of the open space and rebalance of land use is leading to attract new segments of the population and activities. 'In the case of Dikmen Valley to the south of Ankara in the Cankaya Municipality, Developers and builders have been attracted by increasing density and opportunities' (Malusardi, F. and Occhipinti, G. 2003:2).

New legislation: In situations that the land parcels of minimal size only co-ownership is allowed. The residents will take care of the individual housing improvement. Principals and standards urban planning must be applied with flexibly.

Social capacity building

'Upgrading is the start to becoming a recognized citizen' (Afify M. 2000: 5). Providing clinics and health education programs, school facilities and teacher training are needed to attack the lack of basic education, and lastly programs are needed to increase income earning opportunities and the general economic health of the community. The challenge is to move gradually forward by teaching local leaders a step-by-step approach to enhance the urban environment and building capacity.

Informal settlements must be addressed as a problem of people as addressed as a problem of housing. 'Neglecting urban problems leads to socio-economic issues of great seriousness, especially when more than half the poor population living in informal settlements' (Afify, M. 2000: 1).

In order to turn informal cities to formal areas, steps taken would provide a set of formal community attributes that qualifies a settlement as "formalized" starting with land tenure and the complement of urban infrastructure and health and education services. Social capacity building depends on provision of social services and gives attention to people through innovative attempts. Slum dwellers have to get the same level of services as in the formal areas. We need to design new programs for societal improvement, such as teaching children that their families cannot afford them the education not only for financial reasons, but for intellectual reasons also.

Economical capacity building

The main projects conducted by the government agencies to improve the urban environment such as movement axis, open spaces areas, publics' amenities, etc. will attract the entrepreneurs. Governments would not be able to intervene in the slum development processes at the plots level, but they can lead transformation processes. The land value is a key factor that will make landowners able to hold individual or communal partnerships with developers.

"The registered property with an official title allows owners to make an economic use these assets. Some argue that these properties can be used as collateral when applying for a mortgage or in any other real estate transaction. This means, they are now capable to participate and be an integral part of the market" (Claudio, Jr. 2002: 5).

Programs are needed to increase income earning opportunities and the general economic health of the community. Any development process of the slums areas will remain without value if it doesn't lead to improve the economic level of population. Urban areas are mainly economical environments. Residents must have the ability to fulfill the obligations of that environment. Therefore, one of the objectives of development of the slums is to make the resident able to. Shifting from informals to formals areas will charge the habitants additional expenses for maintenance, taxes, and services that the resident must be ready for.

Results

Conventional approaches of informal settlements development demonstrated its inability to deal with the problem.

Improving physical connectivity with the city is the first step toward upgrading the informal settlements.

The provision of public space and community infrastructure impacts upon many people and offers the possibility for broad scale community capacity development.

Create a distinctive public space in the informal settlements leads to a collective belonging (Pavements, bicycle lanes, plazas, parks, promenades, and public sports facilities (that) show respect for human dignity and begin at least to compensate for inequality in other realms).
Capacity building development at the public space level will raise the land value in informal settlements and attract entrepreneurs to invest in the development process.
The reforming of the individual plots needs a long term strategy and regulation to be made, this step could be accomplished through the people themselves.
Rapid interventions to manage development in areas that convert to slum settlements through urban plans legislation and impose fees help control the growth of slums.
Avoiding excessive fragmentation of agricultural land, legalizing the informal settlements together with the creation of alternative mechanisms for housing can control the problem.
The government should shift its vision of upgrading of informal settlements from the scale of individual and plots into community infrastructure supply.
The most important element for success of the rehabilitation of informal settlements is commitment by all: the city, the community, and the families.
The way of dealing with slums through removal rebuilding is very expensive and difficult to be applied, and the number of applied cases is very few.
Urban slums have its own character that cannot be ignored and has helped in finding a solution to the housing problem, but it needs an urban and a socio-economic approach to improve the quality of life.
The upgrading and regularization of informal settlements become strategically important and are now part of the urban restructuring menu in several cities.
The total plan addressing the entire physical/spatial restructuring of the settlement is usually ambitious, costly and not reliable due to problems in topographic accuracy.

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Brownfields in G.C.R.: A Neglected Potential for Re-development the Old City

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Brownfields are abandoned facilities available for re-use, Expansion or redevelopment. Traditionally they are considered as post-industrial sites with negative environmental impacts on- and off-site. Safety is another issue as neglected sites are a breeding ground for illegal activities. Uses in these areas have changed and left for a long time because of legal and economic impediments. However, they present an opportunity in any redevelopment plan especially; in highly populated areas as Greater Cairo region (G.C.R.). This research raises a question on how we could identify the Brownfields in G.C.R.. In addition to classifying them, and knows the role they can play in planning the old city. This research is an attempt to understand the Egyptian definition of the brownfield that accommodates the nature of the city, and analyzing types of Brownfields that can be exist in G.C.R.. The research advocates that analyzing these Brownfields will contribute in solving many urban problems in G.C.R..

Keywords: Brownfields, Cairo City, G.C.R., Urban Development

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Introduction

Brownfield redevelopment issues have been raised the attention worldwide in the past few years. Brownfields are frequently unused land or properties that would have been used as industrial buildings or at other uses that are now declining. They often exist in desirable waterfront lands, city centres and old industrial zones. However, redevelopment has become more common in the first decade of the 21st century, as developable land grows less available in highly populated areas, and Brownfields contribute to environmental stigma, which can delay, the redevelopment process. Greater Cairo region (G.C.R..) includes Cairo, Giza and Qalyoubia with population more than 20 million in 2010; faces a continuous increasing in population annually, beside a continuous migration from rural areas. Theses growing in population caused many urban problems in the city from traffic problems to the on-going development in the informal areas. In fact, Cairo is an old city where urban development started out in past decades and centuries, where the uses of urban areas have changed through time. Some old buildings exist, and others remain as vacant lands with no use. Some of these remaining sites are industrial, and others are old railways storage sites, and some of them are old marinas that were used in the Nile from years ago.

This research raises a question on how we could identify the Brownfields in G.C.R.., and how can be the problematic issue of the properties is resolved. The idea is to identify these Brownfields, classifying them, and knows the role they can play in planning the old city. This research is an attempt to understand the Egyptian definition of the Brownfield, and analysing all types of Brownfields that can exist in Egypt and G.C.R.. specifically.

Brownfields Background

The following section reviews some literature review on Brownfields definition and description.

Brownfields definitions

The blanket term 'Brownfield' is used to describe all abandoned, underused sites, or real property where redevelopment or reuse is complicated by the presence (based on the actual site testing) or perceived presence (based on information related to past use) of contamination. This contamination may include substances such as gasoline, diesel fuel, asbestos, heavy metals, solvents, lubricants, acids, polychlorinated biphenyls (PCBs), and a range of other hazardous materials (APA, 2004).

A Brownfield site is defined in New York State Environmental Conservation law as '...any real property, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant". Examples for sites which could qualify include: abandoned gas stations, old factory and mill complexes and foundries' (NALGP, 2006). In Canada the term 'Brownfield' refers to properties, often former industrial sites that are left underused because of environmental contamination concerns. There are about 20,000 to 30,000 of these sites across Canada, and many of them are located on prime land in this country's cities, ripe for redevelopment (CREA, 2007). The European Definition of Brownfields that 'It is a process of industrial change has resulted in the creation of so-called 'Brownfields' across Europe, Particularly in Urban Areas'. These sites present challenges to redevelopment actions. (Grimiski & Ferber, 2001)

Why Brownfields are existing

The industrial sector worldwide especially in industrial countries began shrinking in the mid-20th century. As many industrial areas were sent out old cities, they often left behind obsolete and contaminated properties.

The mid-20th century, also observed the start of population loss in older central cities, as residents moved into new homes on the urban fringe or relocated to newer population centres outside old cities.
Brownfields redevelopment is one of the major tools that widely acknowledged achieving development which is sustainable. Because the main reason for the emergence of these sites is economic, structural change and the decline of traditional industries, these sites are frequently coupled with a severe loss of jobs and, as a direct consequence, the decline of the neighbourhoods around derelict sites are even of whole cities. In addition, it is commonly recognised and documented that the presence of derelict land has adverse effects not only in the environment but also the economic and social health of the city (OECD, 1998).

Types of Brownfields

Brownfields sites can be classified based on Use, level of contamination and location and use. The following table represent the third type of classification that classify them based on their location and relative use to three main categories as shown in the next table.

Brownfields in traditional industrial area	**Brownfields in metropolitan areas**	**Brownfields in rural areas**
The massive decline in industrial jobs in the coal, steel and textile industries, at the beginning of the 1980s created a need for wider structural change in industry. This cause a lot of squared meters of Brownfields that are no longer used as industrial sites, and some of them classified as contaminated sites because of the precious industry that was there.	Cities are filled with large scale and small scales sites of unused lands. These sites were previously used for large-scale railway and harbour infrastructure facilities, small industries and buildings. Leaving these areas for years due to the change in use create these Brownfields.	Rural areas also contain individual Brownfields sites of a locally limited dimension, which may be hugely significant for the relevant local government authorities concerned. In the past few decades, the sites which were mainly connected with primary economic activities in agriculture, forestry or mining, have been undergoing a consolidation process resulting in the abandonment of many sites.

Table 1. Classification of Brownfields site according to location adapted from (Source: Grimiski & Ferber, 2001).

Benefits of Brownfields

Despite of the fact that many of Brownfields site are classified as contaminated lands, but they are vacant land inside the precious lands of the cities. Consequently, worldwide they have started to change their point of view towards Brownfields recently from being contaminated lands to assets for development of the city. (APA, 2004) The clean-up and reuse of Brownfields provides many environmental, economic, and community benefits. These benefits make many countries all over the world discovered that investment in Brownfields pays off in many ways. Some of these benefits are as follows:

Protection of public Health and the Environment: by encouraging and supporting the reuse of Brownfields, communities can facilitate the clean –up of contaminated land and avoid its negative impacts.

Location benefits: Brownfield location considered as asset itself, because Brownfields are often located in strategic places near waterfronts, railroads and transportation routes, and city centre areas.

Infrastructure advantages: Brownfields are places that have already been developed. They typically are served with existing infrastructure, which can be more efficient to upgrade when compared to extending new infrastructure into other new areas.

Economic Development/ Job creation: Brownfields clean-up and redevelopment can be a base for economic development and expand the jobs and taxes base of the government.

Negative impacts of Brownfields

Brownfields are sites that have, or are perceived to have contamination. They range in size from a single lot to a mighty lot post-industrial site. Brownfields impact communities in a variety of ways. Abandoned or dilapidated buildings on Brownfield sites signal neglect even in an otherwise well-maintained neighbourhood.

Contaminants found on Brownfield sites can pollute soil, air, and water resources on- and off-site. This poses environmental and public health threats. Safety is another issue as neglected sites are a breeding ground for illegal activities, such as dumping. Finally, Brownfields are a drain on the local economy and take a serious toll on community morale, especially in low-income neighbourhoods that suffer from a disproportionate number of Brownfield sites (APA, 2004). Yet, Brownfields are not hopeless places, and, in fact, they are often prime locations for revitalization as they considered as potential and constraint in the same time.

Obstacles and constraints of Redevelopment Brownfields Sites

Many contaminated Brownfield sites sit unused for decades because the cost of cleaning them to safe standards is more than the land would be worth after redevelopment. However, redevelopment has become more common in the first decade of the 21st century, as developable land grows less available in highly populated areas, and Brownfields contribute to environmental stigma, which can delay, redevelopment. Also, the methods of studying contaminated land have become more sophisticated and established.

Brownfield sites present a challenge to redevelopers because they have to be cleaned up before they are ready to be put to better uses. Contaminant levels vary between sites, and in some cases the full extent of contamination only becomes clear after builders start digging into the ground. For this reason, developers have historically been hesitant to develop these risky properties.

The obstacles consistently identified by the proponents of brownfield redevelopment can be summarized as follows (Paull, 2008):

- The land is extremely contaminated and present a highly pollutant area.
- Unacceptable from people owns the land or live by it to change, use or develop it.
- The requirement for large capital investment;
- Absence of adequate and consistently accessible expertise within government agencies dedicated to the development of Brownfields;
- Lack of a common vision, and a consistent system for development.

Greater Cairo Region

Overview of Greater Cairo Region

The importance of Cairo, the capital of Egypt, is highlighted by several names like Al-Qahirah (the Victorious), Umm Al-Dunia (Mother of the World). (Kipper, 2009) Al-Qahira, simply dominates most of aspects of national identity, the reason that everybody calls it Misr, as it is the microcosm of Egypt. (Piffero, 2009) Misr is the Arabic name for Egypt as a whole. (Kipper, 2009) Nothing best testifies its supremacy, and it reflects Egypt's balances and unbalances, social, economic and political pressures and cleavages. (Piffero, 2009) It is the largest city in the Middle East, with age that extended to more than 1,000 years old, with date back to the time of the Pharaohs at some parts of it. (El Naggar & others, 2006) Cairo also was the origin of various foreign eras in Egypt (Fatimids, Ayubids, Mamluks, Ottomans, the French occupation, Albanian Mohamed Aly, Khedive Ismail and the British occupation), and it was the container for their maternity concepts and deeds. (Safey Eldeen, 2008) It was praised as the main centre of heritage, culture, education, in addition to, style in the Arab world, with iconic status in the region and throughout the world (UN-Habitat, 2011).

Figure 1. Greater Cairo Region (Source: ElKhorazaty & Eid, 2006)

'G.C.R.' Greater Cairo region's current population reaches about 16 million; it is expected to reach 24 million in 2022. With an area of 850,000 acres, through connected urban form on the River Nile banks in (GOPP, 2009) "Greater Cairo Region" (G.C.R.) was defined by the General Organization for Physical Planning 'GOPP' in 1982, which is the urban agglomerate that consists of the whole governorate of Cairo. In addition to, the city of Giza and Shubra El-Kheima, nine rural districts of Giza and Qaliobeya governorates, besides another eight new towns located around Cairo. The presidential Decree of 17 April 2008 reorganized the administrative subdivision of Egypt by creation of new governorates of Helwan and sixth of October (Piffero, 2009). The administrative divisions of G.C.R. have been changed to encompass 5 governorates: Cairo, parts of Giza and Qaluobya, in addition to, 6th of October and Helwan, and after January revolution in 2011, the Decree was canceled. (Khalifa & Elshafie, 2008) Each governorate has its own administrative structure separately without administrative body in charge of the whole region. (UN-Habitat, 2011) Or macro administrative structure that covers G.C.R.. as a distinct entity. (Sims, 2003).
Greater Cairo region has been the main attraction point in the country, and the main terminus for internal migration from rural areas and small-size cities, almost 40% of job opportunities and major educational, health and other facilities exist in the region. (Madbouly, 2010) Two third of the country's gross national product is generating in Greater Cairo, and almost 25 per cent of the population occupies in G.C.R. governorates. (UN-Habitat, 2011) As the capital and prelate city of Egypt, the economy of Greater Cairo is probably contributing half of the Gross Domestic Product. (Sims, 2003).
G.C.R.. has a population of about 17.85 million people; Cairo is the most populous metropolitan in Africa and the sixteenth most populous metropolitan area in the world. (Khalifa & Elshafie, 2008) The region, has a relatively stable share of Egypt's total population (approximately 25%), the main agglomeration had a population density of extremely high density in 2006. (Koei CO., and others, 2008) That expresses the densest in terms of population per km2, with an average of 400 persons per hectare and peaks of more than 2000 persons per hectare (Piffero, 2009).
The global dynamics of urbanization has deeply transformed Cairo, which have increased the city's population six times in the past 60 years. (Vignal & Denis, 2006) The fast expansion of G.C.R.. agglomeration has not been met with effective use of limited financial resources allocated to the region. Besides, the governance of the agglomeration has been always an elaborated issue given the intervention between central ministries responsibilities with the local government roles (Madbouly, 2010). G.C.R. as one of the world's most densely populated areas, with one of the lowest road space per capita percentage and spectacular growth in the number of private vehicles; this was aggravated by constructing bridges and flyovers by the government. (El Naggar & others, 2006) The green area per capita is 1.5 m2 in the total agglomeration which is much bounded compared with other metropolitan areas, such as London (27 m2 in 1997) and Paris (12 m2 in 1997). In addition, a significant part of that green area is not allowed for public users as it comprises private facilities that have a closed membership. (Koei CO., and others, 2008)

Brownfields in G.C.R.

G.C.R. represents a fascinating case study of "urban upgrading", as it is radically transformed massive urbanization process that have increased its population in the last decades, ensuing in plucking of informal settlements in its outer boundaries (Piffero, 2009). It has also come to represent urban chaos, typified by areas of privation, rising crime, contamination and congestion (UN-Habitat, 2011). The life is characterized by extremes, both of tradition and modernity (Kipper, 2009). It is facing significant challenges in terms of urban texture and most importantly the potential, various lifestyles it offers to its habitant (El Khorazaty & Eid, 2006).

G.C.R. was already endured as an amalgam of various cultures (and nationalities) waiting for guidance and/or melding. (Safey Eldeen, 2008) It had entered a long period of decline; it was only in the mid-19th century, when it began to reassert itself politically and to enter into a process of economic growth and modernization, dependent mainly on European enterprisers and technicians. (Sims, 2003) So it became a focal point for most modern manufacturing. It also has a vast informal economy besides the formal one, made up of hundreds of thousands of small and microenterprises which absorbs over half of the city's labour force. (Sims, 2003) Factories and industrial zones occupy 10% of the total land area; some of these are the source of environmental pollution and inapplicable for their place inside the agglomeration. The Ministry of Trade and Industry has identified 21 environmentally unfavorable factories that are to be resettled away from the main agglomeration so as to improve the land use efficiency, and rejuvenate the living environment (Koei CO., and others, 2008). According to the final results of the census for year 2006 about (Housing and establishments) issued by the Central Agency for Public Mobilization and Statistics (CAPMAS), no statistical data represent the areas or numbers for Brownfields.
However, only numbers of unoccupied buildings and other category which is (Unused) that can be defined as occupied buildings without activities practiced like military campuses or deserted lands that contained old infrastructure buildings used in the past as shown in table (2). (CAPMAS, 2012)
When the survey was done, Greater Cairo Region was consisted of the five governorates. Statistics for Helwan and 6th of October were included, for Cairo, about 0.5 % of the total number of buildings are regular buildings occupied without activities done inside that made from stable structure (Steel - Concrete structure), while about 0.3 % are Permissibility buildings that made from temporarily structure. The percentage in urban locations of Giza is lower: (0.3, 0.2) % respectively for regular and permissibility buildings, while the urban locations (Helwan, 6th of October and Qaliobeya) acquired the higher percentage for regular buildings.

Governorate		Regular buildings				Permissibility building				All
		Unoccupied	%	Unused (Occupied without activity practiced)	%	Unoccupied	%	Unused (Occupied without activity practiced)	%	
Cairo	urban	26434	6.2	2103	0.5	424	0.1	1183	0.3	426392
	rural	0	0.0	0	0.0	0	0.0	0	0.0	0
Helwan	urban	20344	16.3	1409	1.1	278	0.2	372	0.3	124879
	rural	11439	11.9	945	1.0	29	0.0	88	0.1	96250
6th of October	urban	32823	30.8	1016	1.0	126	0.1	183	0.2	106648
	rural	50624	17.7	996	0.3	437	0.2	417	0.1	286375
Qaliobeya	urban	18121	10.0	1752	1.0	196	0.1	196	0.1	180673
	rural	59479	14.8	2187	0.5	189	0.0	360	0.1	401511
Giza	urban	14563	6.9	619	0.3	250	0.1	331	0.2	210936
	rural	2897	11.5	46	0.2	30	0.1	18	0.1	25135

Table 2. Unoccupied and Unused buildings inside Greater Cairo Region (Source: CAPMAS, 2012).

Example for this type is the railway sheds and depot in Ramsis street, which occupied large areas in a highly distinctive location inside G.C.R. agglomeration, and storage, ship industry uses, and old ports that exist in the western bank of the Nile River in G.C.R. as shown in figures (2) (3).

Figure 2. Infrastructure brownfields. Railway depots in Ramsis square - Cairo downtown. (www.panoramio.com, 2012) (Google Earth, 2012)

Figure 3. Depositories and infrastructure brownfields. Warehouses in Qorsaya island and old ship industry centres in Embaba waterfront at Nile River inside G.C.R. (Researcher, 2011)

Definition of Brownfields in Egypt

There is no definition specifies the term (Brownfields) in the Egyptian laws, and even after the issuance of laws through the Ministry of Housing in 2008 which is the Unified Construction Law no. 119, however, the law identified areas to be renovated and developed through the strategic plan of the city. Article (64) identified re-planning areas that maximize the benefits to both city and region's population, and amendments contribute to carrying out the overall strategic plan and its outputs (MHUUD, 2008).

In order to build a common understanding of the meaning of Brownfields in Egypt a structured interview was done with different planning experts and academics. The aim is to collect not only the definition but also their classification of these areas.

According to Prof. Ghada Farouk (The head of technical office) in General Organization for Physical Planning (GOPP) the "Brownfield" term had not been used before in any of the previous governmental studies or plans work except in the physical survey for (Cairo 2050) that was previous regime's 'national urban scheme'. According to Ghada Farouk the definition "Brownfield" used to identify the sites that are not optimally used according the poor utilization of the land. According to Prof. Mohab El-Refaie' (The head of the Information Centre) in General Organization for Physical Planning (GOPP), while the definition "Brownfield" used before in the survey of (Cairo 2050) project, yet, there was no common agreement on the criteria that can be used to define the relevant sites or buildings. However, it was known between the members of the survey as "ignored / unused lands or buildings", and the best use of it can be determined according the location specification. From the academic perspective; Brownfield is a planning terminology that is used recently in city planning Courses, the term is explained as an international definition that refers as mentioned before to contaminated land. But locally this term is identified as; a vacant land or unused building inside the boundary of the city which properties might be known or not. Cairo as an old city that as mentioned before had a long development history contains many vacant and abandoned lands, these lands were used in the beginning of the century or older than that and due to many circumstances it is closed and remained for years as it is a vacant land within the city.
For most of experts; Brownfields can be vacant lands, the abandoned buildings, with ownership varied from case to another. Most of them found that the huge Brownfields areas in Egypt are located on river banks, old industrial areas, train station old storage, residential buildings. They are not fully destroyed building but some of them are fully existed but only left after the uses were decline. Most of them don't connect between the Brownfields and contamination of the land; they found that most of these lands are not industrial lands only. They differ in use as mentioned above. Furthermore, it is impossible to prove whether this land is contaminated or not without measure the amount of pollution in land or underground water, as there is no studies or current measurement of this.

Statistical analysis of Brownfields in G.C.R. / classification of Brownfields
In 2009, the latest survey contained all parts of G.C.R. made by GOPP and sponsored by UN-Habitat, where the "Brownfield" term was identified for the first time. According to survey the total areas of Brownfields inside the region are about 2,484,305 meters squares, with land values range between 1,000 to 40,000 Egyptian pounds per meter square.

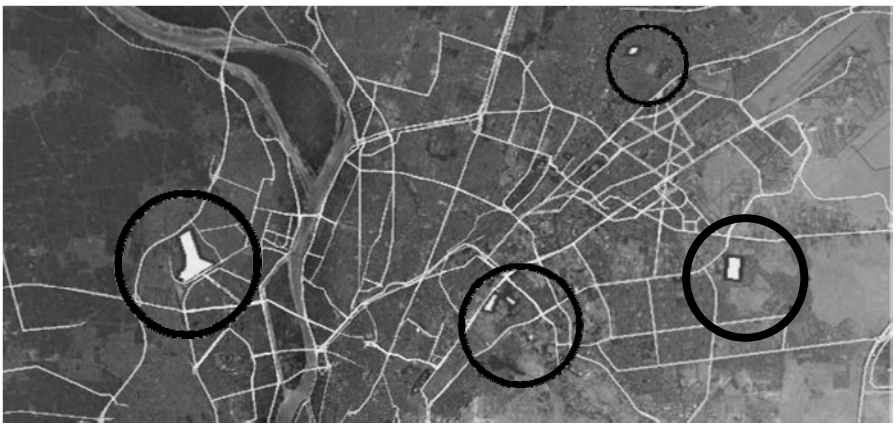

Figure 4. Some Brownfields inside G.C.R. (Source: GOPP,UN-Habitat, 2009)

Original use	Area (meter square)
Residential	273,620.70
Commercial	39,442.80
Industrial	588,843.00
Utilities	158,328.50
Educational	315,432.40
Transportation	982,044.50
Storage	125,457.00
Mixed Use	1,136.10
Total	2,484,305.00

Table 3. Classification of Brownfields according to original land use inside Greater Cairo Region (Source: UN-Habitat, 2009)

Ownerships	Area (meter square)
Ministerial	702,897.90
Local Governorate	872,071.00
Associations	96,857.40
Private	812,478.70
Total	2,484,305.00

Table 4. Classification of Brownfields according to ownership inside Greater Cairo Region (Source: UN-Habitat, 2009)

land Price (L.E. / meter square)	Area (meter square)
Between 500 / 1000	205,415.10
Less than 2000	927,877.80
Less than 4000	325,478.10
Less than 6000	578,479.40
Less than 8000	29,122.10
Less than 10000	294.4
Less than 20000	395,489.90
Less than 40000	22,148.20
Total	2,484,305.00

Table 5. Classification of Brownfields according to land prices inside Greater Cairo Region (Source: UN-Habitat, 2009)

From the above analysis it is clear that Brownfields in G.C.R. is a real potential, because they are located in lands which are inside the city, have infrastructure and near to services. The area according to ownership inside Greater Cairo Region (UN-Habitat, 2009) is 2,484,305.00 m2 divided into different uses and properties, and varied in land prices. These Brownfields cannot be neglected anymore because they represent opportunity for the future development of the city.

Classification brown field in Cairo

Based on the previous definition Brownfields in Egypt can be defined as; a piece of industrial or commercial property that is abandoned or underused and often environmentally contaminated, and considered as a potential site for redevelopment**.** The uses of these areas can be classified by use and by property.

The uses of Brownfields in Egypt are varied between industrial areas, commercial areas, and the ownership of these Brownfields is varied between governmental bodies, private sector and associations. The governmental bodies represent the most percentage among other areas, as it represents more than 60% of the total areas of Brownfields in Egypt. This is can be explained in the light of the political shape in Egypt starting from 1952 revolution which issued the concept of Nationalization of private buildings to be owned by the government. In the last years the government strategy was to empower the Privatization strategy which aims to transfer most of public ownership to private ownership which cause in many cases that these building abandoned with no use.

Concluding Remarks

From the discussion above, G.C.R. is an old region that is currently full of urban, social and economic problems. The appearance of Brownfields in G.C.R. is not only an urban problem but it extended to cover many other problems. Leaving Brownfields areas away from any development will cause many social, economic and environmental problems as well. The solution is to merge these lands in the development plans, because they are not only presenting a problematic issue but additionally the value of the land is a potential for attract investors and developers.

Developing Brownfields is a necessary issue, Instead of leaving them in the centre of the old city without any contribution from the government or local authorities. Developing them under the national developing plans of the G.C.R. is a must. This will not happen easily; there is a great demand for certain changes in many fields to make planners capable to merge them in the planning process.

These changes will be done in different disciplines, starting from changing in the legislation itself. There must be a section in the Unified Building law to define what is meant by Brownfields, and how we can classify them. In addition to that there must be a solution for the property problematic issue, as one of the major constraints of developing Brownfields in Egypt are the Lack of clarity in the ownership of these lands. Additionally most of them are owned by the government and this is not only mean one ministry or authority but it might be different authorities that owned Brownfields inside the capital and completely neglecting them and leaving them without any maintenance or future developing plan.

In order to merge brownfield in the planning strategies of the G.C.R. the following points must be achieved;

- Conduct a detailed survey on all Brownfields land in G.C.R.
- Establish an organisation responsible for brownfields in G.C.R. can adopt all future projects and manage the public participation with the residents.
- Update the planning law (unified law) to identity what is meant by this term.

- Classify Brownfields by use and level of pollution and contamination in order to have an action plan of how we can solve their environmental problems and the best ways of contribution.
- Merge the Brownfields with development plans of the city; this can be happened by Compensate landowners' amounts by money for abandoned state.
- Involve public participation with the government in the planning strategies of Brownfields especially huge areas like; old rail ways in Cairo.
- Facilitate the cooperation between planning authorities and local authorities through establishing the mentioned organisation body.
- Encourage developers and investors to develop project in Brownfield areas in G.C.R.

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Cairo the Combat Land. The City Layered

Mohamed Alaa Mandour[1]

The expansion of Cairo's informal areas is due not only to rising poverty levels, but has been fostered by the permutations of series of deliberate policy choices and market dynamics which were not properly dealt with. The idea came from the dense fabric of our cities, the community of layers. The 4D space-time modeling as a manifold in space of large number of measurements provides a real possibility of constructing a way for large-scale cities of a four-dimensional physical space-time for decoding all cities intersected harms. Focusing on planning to produce space using the temporal relations to spatial transitions will describe the impact of changing spatial structures on temporal patterns. The research will discuss the proposed method from all of its fringes and the new gesture values which will be shaped for city formation, both hypothetical and initial applicable model done in practice to serve in upgrading or rehabilitation of informal settlements and weave the city patches.

Keywords: Informal housing, City patches, Culture layers, Deconstruction, Space-time.

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Introduction

The needs for 3D city models are growing and expanding actively in various fields includes urban planning and design, architecture, environmental visualization and many more. The efficient generations of the 3D city models are improving the practice of urban environmental planning and design. For example, planning authorities will be able to illustrate explicit photo-textured information of what the city environment will look like after a insinuated change. Photo-textured and three-dimensional models enable easy understanding. It is relatively easy to layer abstract phenomena over a detailed model. User would be able to distinguish particular elements, spatial position, scale, and to relate plan details and other information within the area under reconnaissance. The computational power of this technology to transform and instantly compare alternative representations provides decision-makers with unprecedented flexibility. When and if visualization tools and good data are widely available, one will be able to propose changes to a city without a dialogue that includes a systematic investigation of the visual implications of a design (Eran S., et al 2009).

There are various terminologies used for 3D city models such as "Virtual City", "Cyber town", "Cyber city", or "Digital City". 3D city models are basically a computerized or digital model of a city contains the graphic representation of buildings and other objects in 2.5 or 3D. The term 2.5D is used for describing models where there is only one unique Z-value (elevation value) defined for each pair of XY-coordinates (M. Sinning et al, 1996). 2.5D ("two-and-a-half-dimensional"), 3/4 perspective and pseudo-3D are terms, mainly in the video game industry, used to describe either: 2D graphical projections and techniques which cause a series of images or scenes to fake or appear to be three-dimensional (3D) when in fact they are not, or gameplay in an otherwise three-dimensional video game that is restricted to a two-dimensional plane.

However, some type of objects like CAD models or solid models can be represented as 3-D. The most important characteristic of 3D city models are the possibility to navigate through the model by walking, flying and examining (Bourdakis, V.1997). Walking means moving on the model surface, flying has three dimensional freedom of movement and examination is a view where the entire model is visible in the view port and the user is free to rotate the object in three dimensions. 2.5D visualization and 3D visualization have static predefined viewpoint and users only move the object rather than engage into the environment. The highest form of visualization is using virtual reality (VR) technology. VR offers new technique for visualizing 3D city model. This is the reason why virtual 3D city model term is used instead of just a 3D city model. By using the VR technology, navigating through the model so easy. The environment where this model consists is known as virtual environment (VE). A virtual 3D city model can be viewed on a computer screen, projected on a large screen or with head mounted displays (HMDs).

Virtual Reality (VR) is an interactive and immersive real time visualization technology that offers people the opportunity of visualizing, interacting with and manipulating complex data in a real-time 3D environment by means of the most advanced computer technology. VR is a cutting-edge technology and the interdisciplinary communication tool of the future. It allows users to evaluate planning results in real time and to compare alternative concepts. By using these technology decision-making processes are shortened, information and appreciation are improved and the identification with the city increases. VR applications include basically the following components: A three-dimensional visual database: the Virtual City Model, real-time software package to interact with, visualize and practically use the database, and an appropriate virtual reality hardware system (input devices, computer technology and image representation systems. (Bendinger, J. 2008).

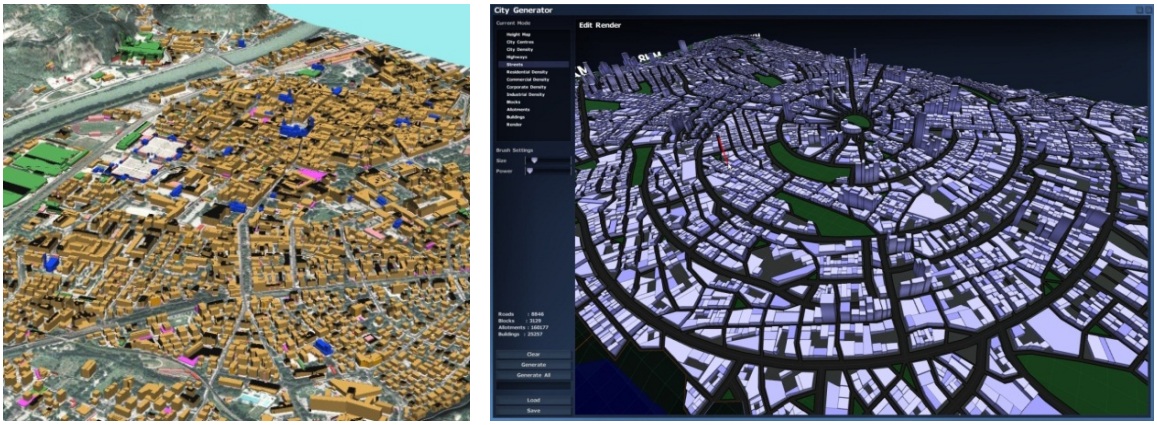

Figure 1. 3D City Visualization
Figure 2. City generator.
Source: http://forums.introversion.co.uk/introversion/viewtopic.php?t=1132

Virtual City Models are created by means of state-of-the-art technology. Basic digital geographic data, relevant information obtained from the city's Geographic Information Systems and three dimensional architecture models are used to establish a geo-referenced three-dimensional municipal database: land surveying geographical data (digital cadastral map), digital terrain models (DTM), digital surface model (DSM), digital aerial imagery, orthophotography, site plan, floor plan, cross sections, views, location photographs, model photographs, material and surface description (Bendinger, J. 2008).
4D expression describes the real-time software packages which allow viewers to interact the 3D model with the real time data. The software controls both interaction devices and output systems. Input data is computed in real time to produce at least 20 images per second. As Virtual City Models are of high complexity, they contain extremely large volumes of data and could be presented in the past only on high-performance graphics computers. Now, the software solution HYVE (Hybrid Virtual Environment) allows users to view the models on PCs, too. The resulting cost benefit is considerable: large data volumes are processed in less time, and costly hardware systems are no longer needed (Bendinger, J. 2008).
VCM offers planners, architects and stakeholders an effectual tool for plan regulatory and decisions making purposes. Incorporating urban development revelations and different planning alternatives, act out various stages of completion and viewing schemes in infrastructure and traffic engineering are useful tools to assess ideas and speed up decision-making processes. VCM may be used to check infrastructure, traffic engineering and ecological concepts prior to involving implementation costs.

Cairo

Cairo has been deeply transformed by the global dynamics of urbanization, which have increased the city's population by more than six times in the past 60 years. While the migration of rural populations has in the past represented one of the major factors fuelling this urban expansion, recent studies show that this is no longer the case. In 1960, an estimated 35% of Cairo's inhabitants were not born in the city. In 1996, only 12% were born elsewhere (Vignal & Denis, 2006). The capital's growth is now due mainly to natural increase and to the incorporation of surrounding villages and rural populations (Development Planning Unit & Urban Training College, 1999), while its growth rate of around 2% is not dissimilar to the one reported for the whole of Egypt (Piffero, E, 2006).

Cairo Informal housing now represents the dominant residential mode, there are very few shantytowns and proper 'slums' in Cairo.
Apart from some inner pockets and some of the more remote, recently urbanized fringes, the overall quality of construction in informal areas is reasonably good, especially where it has been consolidated. Nevertheless, because of their unplanned and 'random' construction—from which they derive their name in Egyptian Arabic, 'ashwa'iyyat, meaning 'disordered' or 'haphazard'—these informal areas suffer from problems of accessibility, narrow streets, the absence of vacant land and open spaces, very high residential densities, and insufficient infrastructure and services (World Bank, 2008).
Informal development has been, and continues to be, the dominant mode of urbanization in many developing countries, including Egypt.
It occurs especially on the urban fringes, on privately-owned agricultural land, rather than in desert areas, which would be considered squatting on state-owned land. Despite 30 years of attempts by the government to limit unplanned growth and urban expansion on agricultural land around Cairo, as it has in most Egyptian cities and villages, informal settlements around Cairo sheltered more than 7 million inhabitants in 1998 (Séjourné, 2006).

Methodology

An understanding of how the different layers of the city can be used as basis for design interventions, through rigorous exploration of the city from a regional and global context to smaller scale physical design; we developed the ability to reduce complex city systems into multiple interactive layers. By intensely researching the different system layers that underlie the city from human to infrastructure to ecological as well as examine the physical form of a neighbourhood they gained an integrated and systems-based understanding. In conclusion, we will come up with specific design solutions for various problems (fig. 3).
The four-dimensional space-time as a manifold in the space of a large number of measurements provides a real possibility of constructing a way for the large-scale structure of a four-dimensional physical space-time and, in particular, a mean for solving all cities intersected harms. Focusing on planning to produce space and using the temporal relations to spatial transitions will describe the impact of changing spatial structures on temporal patterns (fig 4).
Applying the layered dimension model of spatial transitions patterned will evolve patterns such as road patterns, social pattern, space typology pattern, transition patterns, etc., tracing changes and relations between space and time for each pattern will abridge the planning progression as a destructed layer. Then merging the new constructed layers all again in a whole map to form the new model. Respectively forming the city layered shape from the deconstructed layers, which has been well structured and studied one by one.
The points of intersections and interruptions will be clear in the merge process. That is to say working on each layer alone to fill up all the data and try to resolve all the problems and then work on the merged layers and locate the points of juncture come across solution to it. For example, the layer of roads to work on it and solve all the issues related to it, then during the merge process minimal intersections and problems as most of it is adjusted in the one layer process.
Since the Model can be linked with any kind of actual and planning data the VCM is a tool for acquisition and settlement discussions. Marketing relevant data like the economic potential, prognoses and site-related factors resulting from the working process of administration and economy can be made available easily.

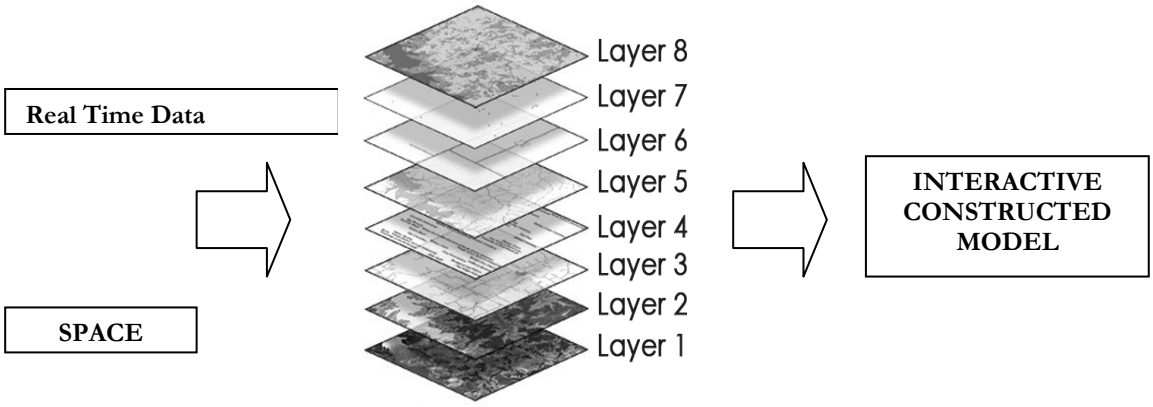

Figure 3. A conceptual diagram for the City layered and space- time Model

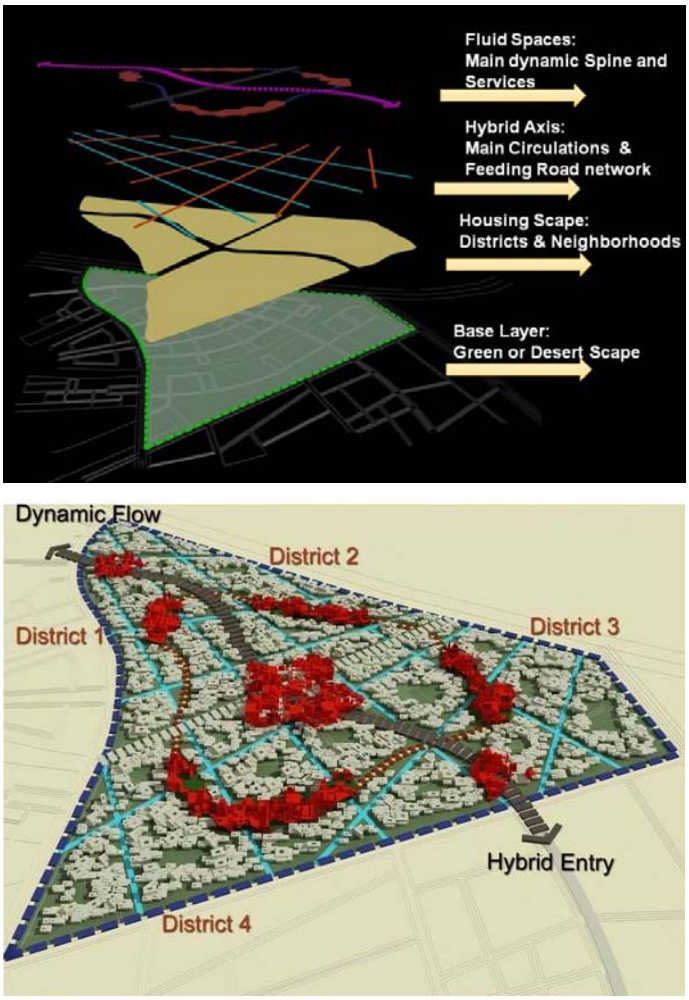

Figure 4. Application of the City Layered Model for new planned city

Case study I: A newly city planning process

The example shown is for a new city planning where we tried to solve the city components each one by itself. That is to say a way of deconstructing the layers and reshape it in a total way. We started the early concept also with a layering method which consisted of the following layers: Fluid spaces, Hybrid axis, Housing scape and a Base layer. Forming these layers in 3D and solving all its intersections and zones then overlaying all the layers over each other to form the whole. The next step is finding the harmed areas in the master plan and finds the suitable solution for it. Revaluating the plan standards to form the developed master plan and finalize its zones and components. Finally form the concluding 3D city or model with all the constituents of the master plan that comprises of: housing, roads, services, nodes and green spaces. Fig 5. The temporal model here was in the terms of the sales office management of the plots which reflected the client's needs so to modify the master plan plot areas according to the market statistics which was linked to the data base of the stock market. Where any raise or decline in the market values of developers, contracting companies and according to the indicators of the real estate market gave a representative data. Accordingly represented a new market need and is reflected on the master plan by pre-set queries or interactive solution link on the thematic map. For example if the market indicated a need of smaller plots the pre-set query will simulate the land division into smaller plots according to phases of the master plan. Again if the market needed bigger plots it changes it. Another example is installments percentages which is linked to the company position in the stock market where any gain or loss will be reflected on the amounts and percentages of installments for new clients.

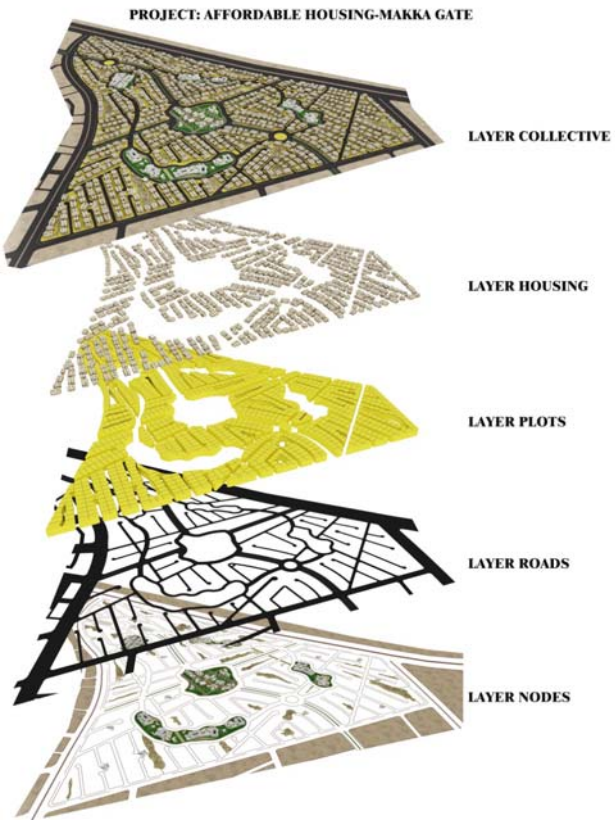

Figure 5. Showing the constituents of the city layers and final collective layer of the master plan

Case study II: An existing urban pattern

A sample was taken form a squatted area in Boulaq al-Dakrour, which is located in southern Cairo. Boulaq al-Dakrour, which has between 1 and 2 million inhabitants depending on the definition of the border of the district, is on the west bank of the Nile. The area stretches from Faisal Street all the way to Arab League Street. It is separated from Mohandessin and Dokki by the tracks of the Metro. The area used to be agricultural land. The farmers sold the land to people who started to build houses. Fig 6

The streets of Boulaq al-Dakrour are very narrow, straight, and extremely long. The pattern of the district follows the old pattern of the drainage canals of the former agricultural land. Houses are generally five to seven floors high. As there are nearly no open spaces in the densely populated area, lack of ventilation and light are an issue. The social fabric is more diverse than other districts. Many of the people of Boulaq al-Dakrour moved here from other districts within Cairo such as Saida Zaynab, Agouza, or Imbaba, all of which are popular quarters that started to become overcrowded by the end of the 1980s. Boulaq al-Dakrour is popular because it is quite cheap and its location is central. Many people work as employees in ministries elsewhere in the city. Even though there are the extremes of very poor and very rich people, most of the people are part of a broader middle class.

Figure 6. Showing the narrow streets of the district

The start of the project is to identify the study area and with a high resolution image we build up the 3D model and make sure that the layering system is working well and identified (Fig. 7). Layer roads is the main layer as it will have a lot of work on it, layer infra-structure which will include the water supply, drainage or sewage and power supply. Another layer can be done is for open spaces and also the layer block which will represents the housing tissue or pattern in the area.

The importance of the layer block is to see the overlay between it and layer roads when suggesting a new road. After the model is been constructed it can be worked layer by layer to form a rough solution.

In order to make the solution easily worked out we can divide the zone into smaller patches and then work out each patch and then assembly the patches together to form the whole map or layer. An over collective map will be formed to consist the solved map where we will trace the harm areas and intersection parts from the merge process.

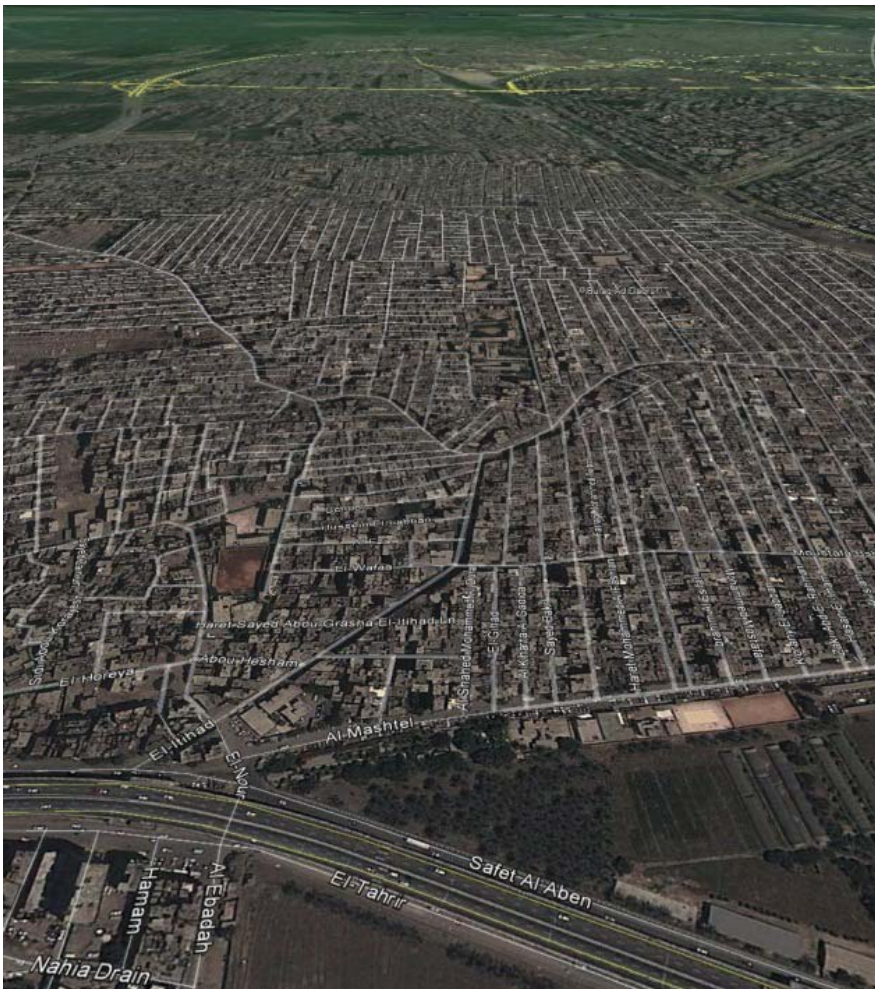

Figure 7. Boulaq al-Dakrour District as a study area

The temporal part will work in implementation of a pilot project and verify a sensor track to this area by radar or satellite imageries. Linking this sensory application to the map will create a real time working map which will monitor all the changes happing in the pilot project leading to second by second interactive map. This can be applied layer by layer on the GIS system to resolve the problems in Virtual Reality and monitor the change on the implication of any solution on the real work.
Below is a simple example of the layered map and the patch solution. The sensory part needs more information and applicable model (fig 8).

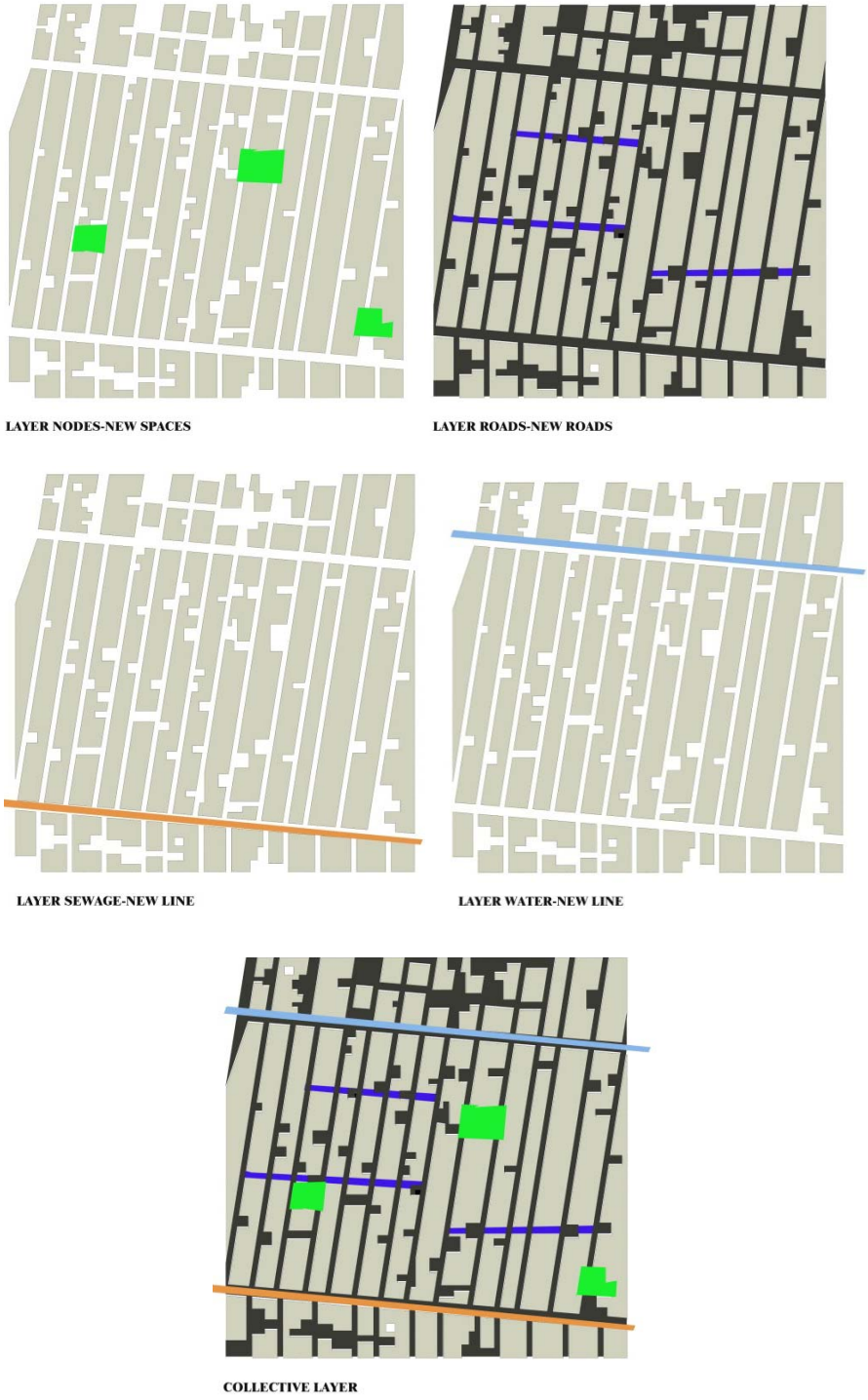

Figure 8. Patch layers as a pilot project area of the study area showing the propose new roads, spaces and nodes

The example explained is still in the experimental phase, the idea seemed in the beginning an impossible one but the commencing of the pilot zone gave some positive indicators. The start will be by the roads layer with a sensory indicator and monitoring cameras to perform the traffic impact assessment.

Understanding the demands placed on the community's transportation network by development is an important dimension of assessing the overall impacts of development. All development generates traffic, and it may generate enough traffic to create congestion and to compel the community to invest more capital into the transportation network, whether it is in the form of new roads or traffic signals or turn lanes. Traffic congestion results in a number of problems, including economic costs due to delayed travel times, air pollution and accidents. As one roadway becomes congested, drivers may use others not necessarily intended for through traffic.
All the gathered date from the sensors which measure the air and sound pollution also the statistical date of traffic and pedestrian trips and movement will also be shared with the other layers as open spaces and communal nodes.
The aim of this study is to come up with some guidelines to mitigate traffic congestion at the community level, encourage consolidation of trips by providing mixed use development, and encourage alternative modes of transportation. To be pedestrian friendly by including smaller set-backs, requirements for parking behind buildings, and building sidewalks—including sidewalks that provide connections from the development to residential areas.

Conclusions

Neighborhoods, cities and regions are complex phenomena. The way planners and urban designers think about and communicate their ideas about urban problems and their solutions is strongly, although not exclusively, visual. Visualization of urban planning and urban design is based on three premises (Dodge et al., 1998): To understand nearly any subject of consequence it is necessary to consider it from multiple viewpoints, using a variety of information; Understanding complex information about urban planning and urban design may be greatly extended if the information is visualized; and Visualization aids in communicating with others.
Communication and Visualization is at the heart of the planning system, the map and plan in two-dimensional form has been the norm, although extensions to the third dimension are important through urban design, which acts as the interface between planning and architecture. Other visual media such as photographs and statistical presentations through charts of various kinds also supplement the way such communication takes place. (S. T. Bhunua, et al 2010).
The potential of visualization in the planning and design of the built environment is very significant. The ability to represent, model and evaluate changes to the built environment on the computer desktop and over the Internet offers potential to enhance the planning and design process; and also help communicate ideas and developments to the public at large. Virtual City Models are designed for an interactive visualization and presentation by means of virtual reality tools and technologies. VCM may assist in the following fields: international, national and regional marketing and location promotion; decision making in choosing between various architectural planning options and in competitions for architects; preparing occupancy concepts; simulating infrastructure, traffic engineering and ecological concepts and furnishing information to the media and the public at large.
Further research is needed to study and evaluate current methods for generating reality-based 3D city models with the purpose to identify shortcomings and promising solutions. Also look into the problem of updating and maintaining 3D city models (4D city modeling), with the particular goal to find proper solutions for efficient change detection and modeling. Finally, a particular challenge will be the user specific visualization of the 4D multi-sensor data showing the urban objects and their dynamic behavior.

Visualization must handle spatially anisotropic data uncertainties and possibly incomplete dynamic information. It may also integrate some of the data fusion steps.

There is a growing need for novel ways to access the exponentially growing archives of historical imagery. It is imperative to go beyond cataloging, indexing, and keyword driven databases, to a paradigm where the computer at least partially understands the content of images. Pushing the state of the art in scene understanding and 3D modeling will enable radical new ways to view and experience historical and/or temporally varying imagery. The research described here aims at building time-varying 3D models that can serve to pull together large collections of images pertaining to the appearance, evolution, and events surrounding one place or artifact over time, as exemplified by the 4D Cities project: the completely automatic construction of a 4D database showing the evolution over time of a single city. (Dellaert F. 2007)

The research envisioned in this proposal will lead to a new kind of city models for monitoring and visualization of the dynamics of urban infrastructure and development in a very high level of detail. The change or deformation of different parts of individual buildings will be accessible for different types of users (geologists, civil engineers, decision makers, etc.) to support city monitoring and management as well as risk assessment.

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Ard al-Liwa Park Project: Towards a New Urban Order and Mode of Professional Practice

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Noheir Elgendy[2]

Since January 2011, Cairo and many Egyptian cities have witnessed a breakdown of security apparatus and the relative absence of state enforcement institutions. Such condition has enabled the exponential rise of community initiatives, in both measure and kind, rendering a fluid urban landscape in state of flux. This paper aims at understanding the new typological relations between formal and informal areas and modes of development within this period. It discusses the process of designing, legalizing and negotiating different authorities for a community park at Ard al-Liwa, an area lying on the margin between the formal and informal parts of the city. The paper is anchored in the specificity of the project and its strategic location, which lends itself to a broader framework for development. Through a community-based design process, it investigates the role of the architects and planners in the regeneration of the informal city, and suggests that new modes of professional practices.

Keywords: Separation, Integration, New urban order

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A Context and Introduction

For the past 18 months Cairo has been experiencing a process of urban transformation unparalleled in its recent history on two different levels: changes on the ground and a new mode of urban citizenship. Many Egyptian cities have witnessed since January 2011 a breakdown of security apparatus and a relative absence of state enforcement institutions, generating an exponential rise of community initiatives, in both measure and kind, and creating a fluid urban landscape in state of flux. And while 'informal interventions' have been a hallmark of Cairo public space for decades, new genre of informality has emerged taking advantage of state vulnerability and increasingly empowered communities.

In addition to the physical transformations resulting from marches, protests and street battles, Cairo's neighbourhoods and public spaces have all been subject to a process of informal encroachment, taking advantage of the absence of law enforcement. Individual and communities, on the other hand, have been empowered and emboldened by the overthrowing of the regime, challenging authorities and reclaiming their right to the city and public space. Both phenomena are interconnected and may best be illustrated by concrete examples, where local communities are taking the initiatives, changing their urban environments and reconstituting their meaning.

Building on the experience of Ard al-Liwa Community Park, this paper aims at highlighting the significance of an emerging urban order, redefining the role of professionals and academics amidst a fast-changing urban landscape. The paper suggests ways in which such model may offer an alternative developmental approach to informal areas in Egypt and other cities in the developing world, where states have become increasingly unable to cope, both economically and politically, with the magnitude of the informal urbanization process.

Types of Informal Initiatives

This project falls within a new typology of formal-informal interface, and has been recognized as a prime example among many other case studies being documented during the past 18 months.[3] They range from the simple encroachment on sidewalks and streets, horizontal and vertical extensions to existing structures and premises, building on state land or privately-owned agricultural tracts, to the construction of highway exits and other infrastructure projects entirely by local community effort.

To understand the significance and extent of such phenomenon, one needs to go back to the weeks and months immediately after the Revolution.

The so-called popular committees, which had been formed in almost every street or neighbourhood to defend their homes and properties when security forces had a total meltdown, had subsequently evolved into broader coalitions of youth and active citizens gradually shifting their focus and mandate from security questions to development and awareness-raising efforts. In the absence if active and transparent bodies of local governance, these coalitions or initiatives have become an alternative forum for debating and negotiating competing interests and often conflicting priorities in such communities.

A distinction could be drawn between two levels of interventions. The first include individual efforts and encroachments on public space, such as tea stands, food stalls, street vendors and informal parking regulations, whereby many shop owners and some residents 'reserve' the area outside their premises as their own, or at least for the exclusive use of their customers/guests.

[3] Reference to Nagati, O. and Stryker, B., 'Archiving a city in flux: Cairo's evolving Urbanism pre and post-Revolution'. Research in progress funded by Ford Foundation.

The second level, however, involves interventions by groups or communities, which entails higher level of collaboration and coordination, and often more complex network of fundraising and organization. In some cases, the type of interventions also involves more sophisticated construction or engineering systems, such as the construction of mega sheds, raised platforms or ramps. Two example of the latter are worth nothing.[4]

Lino's Café used to be a roadside tea stand similar to tens of others scattered on both sides of the ring road and many other major highways. During the months after the revolution, the two brothers Ali and Mutwally and their bro-in-law Hatem, began to construct a more elaborate "resting point" for truck and microbus drivers by offering a full coffee-shop services and snacks in a more elaborate seated and shaded area. The location, which is less than a 100 meters away from their residence in Izbit Khayrallah informal neighbourhood, was carefully chosen at the "bridgehead," where a locally constructed stairway leads up to an informally organized microbus stop. The station is, thus, a natural hub for both riders and drivers offering an excellent business opportunity.

The challenge the Lino's brothers faced was not only extending electricity and water connection to the new premise, something that was overcome by extending a cable from the nearest light post and providing small water tanks, but rather the sloped retaining wall flanking the ring road from both sides in this area. They devised a simple and affordable engineering solution to level it out, creating a raised platform accessible from the highway, which was later covered by a makeshift wooden shed (the latter gets elaborated upon every time I pass by it). The innovative 'engineering solution' was so successful to the extent that it was immediately copied 50 meters away, typical of the *modus operandi* of informal development based on the multiplication and optimization through trial and error.

The second example is *Al-Mi'timdiya Exit*—an informal on and off ramps constructed in the three months after the fall of the former regime. It is located in the stretch between two formal junctures: 26th July Corridor, about 1 km to its north, and Saft al-Laban Corridor, 2 km to its south. The informal area of al-Mi'timidiya had evolved from a rural settlement to a fast-growing residential area further west to the informal belt around the city's western and northern limits. It has, thus, 'fallen outside' the ring road when it was constructed at the turn of the twentieth-first century, in part to delineate a new city limit and contain further encroachment on fertile agriculture land by informal housing development. As such, the community of al-Mi'timidiya had no linkages to the city other than passing through the whole informal belt from west to east and then crossing the railway at limited access points.

The ring road, which literally over-passed the area for a decade, offered a rare opportunity for a vehicular access point. And while this idea, and probably a clear scheme has been percolating for a long time in the minds on the community leaders, it was only during the time when the security apparatus collapsed and the state was most vulnerable that the moment of execution arrived. The project, which costs around a million Egyptian Pounds (one quarter of the amount it would have cost if constructed by the government), required the mobilization of all resources al-Mi'timidiya community could muster.[5] Some contributed with cash, while others in kind, donating material, machinery, labour and know-how.

Once the piles of garbage and debris have been removed, four ramps were constructed copying the existing exits nearby and adopting similar techniques and 'adjusted' codes.

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[4] Some of these examples have been presented in Omar Nagati, "Informalization as an urban revolt: Reclaiming space, reproducing 'order'," as part of a Post-Graduate Conference: *Re-evaluating the Postcolonial City: Production, Reconstruction, Representation*, University of Leeds: 2nd -3rd of February 2012.

[5] Based on an interview with Abdel Nasser Abou Musa, community leader, key member of al-*Mu'timidya Baladna* NGO, and one of the organizers of the Mu'timidiya Exit. Personal interview with Omar Nagati, December 2011.

The process of construction was meticulously documented and edited in a epical presentation material, sent to the governor and police chief in Giza, inviting them to inaugurate the project—something that they did willingly, celebrating the heroic deed by the revolutionary citizens and assigning the area under the highway as a traffic police point, thus lending legitimacy to what would otherwise in a different time and place be deemed a criminal act.

The two cases discussed above are part of a whole range of other examples that illustrate a new mode of urban order, whereby individuals and communities are taking the initiative, imagining and implementing their dreams of a city, the making of which they had long been excluded. Not only do they challenge the urban status quo, offer alternative, but often invite professionals, architects and planners, and policy makers in subsequent stages to join them *on their own terms,* in what could be viewed as a process of public-private participation from below. The Ard al-Liwa Park project is yet another testimony of this inverted model.

The Project Context: Ard al-Liwa and the Park Site

Ard El-Liwa is a 'typical' informal housing development on the agricultural belt on Cairo western periphery. Dating back to at least three decades, it bears the characteristics common to many other informal developments: high density, substandard infrastructure, insufficient public services and poor connection to the city at large. One of the latest studies of Ard Al-Liwa estimates its population to about 300,000 inhabitants occupying around 470 acres, and rendering its density to an average of 638/acre.[6] The area is located to the west of al-Muhandisin District, an upper middle class neighbourhood that has witnessed a real-estate boom during the 1980s and 1990s, and is separated from which by the regional railway to Upper Egypt and al-Zomor irrigation canal. Up to the 1970s, as cadastral maps illustrate, the area has been predominately agricultural fields that began to rapidly transform into informal housing as a twin city, dependent on al-Muhandisin in both its economy and in terms of public services. In the late 1990s, along with the neo-liberal policies adopted by the cabinet then, the programs of new private development on the city's desert edges were gaining momentum.

A new network of infrastructure was constructed at the turn of the century, including two major freeways, the Ring-Road and 26th July Corridor, defining the boundaries of Ard al-Liwa from the west and north respectively. The intersection of both highways constitutes one of the major traffic junctures approaching Cairo from the west, defining the outer limit of the Ard al-Liwa and rendering it most visible for daily commuters as well as travellers to Alexandria and the Mediterranean Coast. Ard al-Liwa, in short, is delimited by three major urban transportation corridors, which have been drawing the city limits between the twentieth and twenty-first centuries. These corridors have also been paradoxically contributing to both Ard al-Liwa's misfortune and its potential development opportunities. On the one hand, they define its borders and limit its accessibility and connection to the city proper. Their close proximity, on the other hand, offers visibility and potential public attention, something that other informal areas are lacking.

The Site: Straddling the Gap

One of the only remaining undeveloped sites—partly due to the fact that it is owned by the Ministry of Awqaf (Endowments)—is a strip of 12-14 acre parcels parallel to a key transportation and irrigation corridor that defines the western limits of 'city proper,' while separating planned/formal districts to its east from informal districts to its west.

[6] Statistical data based on reports by GOPP 2009, ISFD 2011 and GOPP 2012 (ongoing survey).

The site remains a rare opportunity to accommodate lacking services and establish active interface between the increasingly segregated formal and informal developments on its both sides.
In the community's imaginative geography, the site has for years served as a potential container to accommodate many of the services lacking in Ard al-Liwa, as well as an untapped reservoir of open land for recreational facilities and green areas. Throughout the past few years, there has been a number of schemes, dreamed or actually charted on paper, to resolve some of the chronic issues surrounding the site, such as the congestion and traffic hazards at the railway crossings, the street vendors and informal transportation hubs, as well as environmental and sanitary concerns due to the piles of garbage dumped into al-Zomor Canal. Some of these community initiatives are to a large extent technically credible and have in fact been communicated with different levels of authorities, but were mostly stalled for lack of financial support and political will.[7]

Figure 1. The Awqaf parcel, an aerial view of the project site (Hamdy Reda, 2011)

The Ministry of Awqaf has designated this site to develop a large housing development scheme comprising fourteen blocks, including five affordable and nine upscale apartment buildings. By the end of 2011, all necessary approvals were acquired, and the site preparation process began in late March 2012.[8] Local community leaders, waking up to sounds of bulldozers, stood for what they viewed as their right to decide the fate of such precious land, which they considered to be hijacked by investors and state cronies.

[7] Throughout the process of documenting earlier visions for the site and its surroundings, the design team has identified a number of developmental projects that had been proposed by local individuals and associations, such as Hanaa Gad, *Fasil wa Nuwasil,* Graduation Project, Cairo University 2011, and Abou Farouk, *Proposal for the Railway Crossing Area,* unknown date.

[8] Egyptian Ministry of Awqaf, Projects' Depratment (2009), *Housing project on Waqf Mohamed Sinan, Ard al-Liwa.*

Empowered by 'revolutionary spirit,' they not only stopped the construction process, but also managed to escalate their demands through media and local MPs, who helped arrange a meeting with former Prime Minister, Kamal El-Ganzoury. The latter acknowledged the failed purpose of such housing project and endorsed their demand for an alternative vision of recreational hub and service facilities.

The success of this community initiative could thus be ascribed to their persistence on two parallel tracks. On the one hand, it has been a result of a cumulative process of developing visions for this parcel over the past few years. This envisioning process, on the other, was compounded by organized efforts to confront government plans to build more housing blocks.

Such dual process of resistance and alternative proposals, which is situated within the context of the rising urban citizenship, culminated in an approval on the highest official level, bypassing conventional bureaucratic procedures and classic institutional frameworks necessary for similar projects of the same size. The next logical step was to turn their vision into a blueprint—a master plan according to professional standards and planning codes.

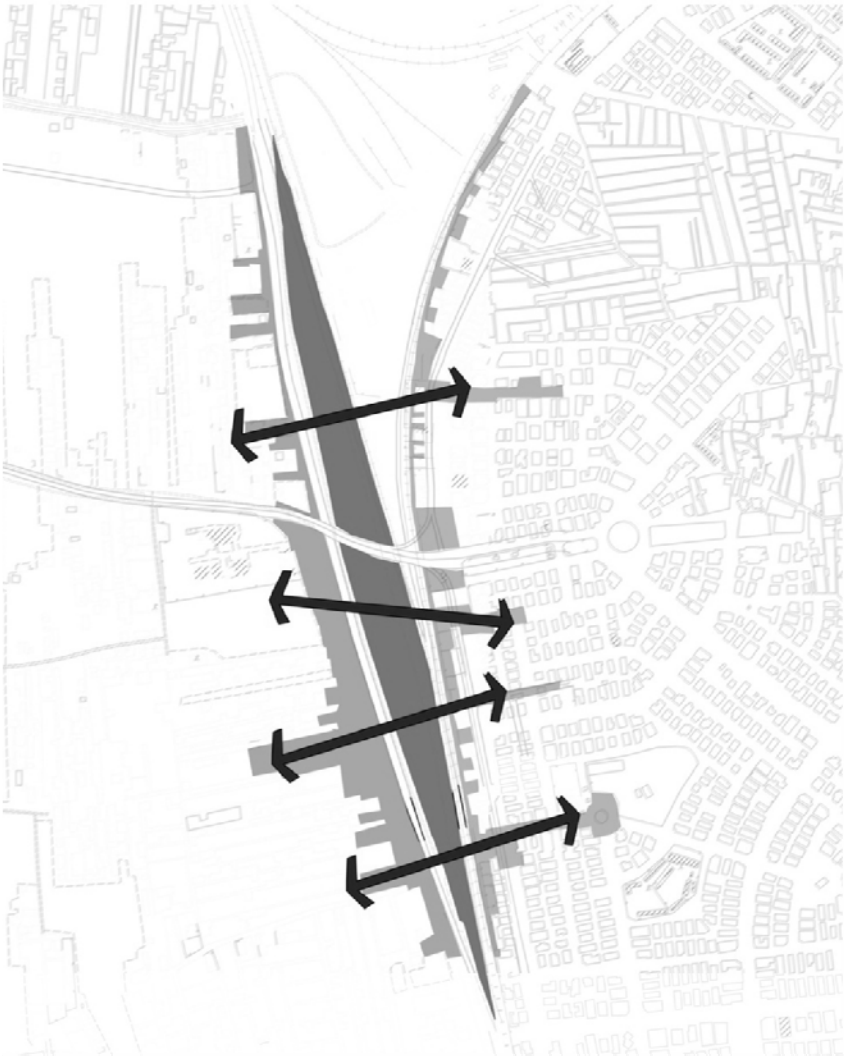

Figure 2. Ard al-Liwa site map (Cluster, 2012)

Planners' Involvement and Project components

Ard Al-Liwa Youth Coalition approached Cluster group, based on earlier engagements and previous experience, requesting to translate their needs and aspirations into a technically feasible planning scheme, and thus turning an oppositional position into a proactive developmental vision.[9] The latter would then be presented to different authorities and stakeholders, to gauge their interests and win their approvals, but also as a means to consolidate their vision into a real measurable project, which could then be subjected to both technical critiques and financial assessment. The specificity of the site and its strategic location lends itself to a broader framework for development that would address urban issues on multiple levels, from the neighbourhood, district to city scales as follows.

1. For its immediate context, the site would provide Ard Al-Liwa and surrounding informal areas with services and open spaces lacking in such densely populated and underserviced areas. Through a number of workshops with local community representatives, a design brief was developed including major public amenities, such as health, education, vocational training, sports and recreational facilities and municipal services.
2. On a larger scale, the site location offers a rare opportunity to restructure the distorted relationship between informal and formal parts of the city, from one of marginalization, exclusion and dependency, into one of integration and interdependence. The project could thus be viewed as a bridge or meeting point between two districts: Al-Muhandisin and Ard al-Liwa, on its both sides. Lateral connections, such as bridges and elevated pedestrian passageways, as well as common plazas and gardens are proposed as the principal planning framework for the park project.
3. Thirdly, on a city scale, the project falls within a grand urban transportation corridor, which would potentially be converted into a major green spine as part of a network of greenways in the city at large. Such network would promote alternative environmentally friendly modes of circulation and rapid transit lines. The project thus aims at turning the generic condition of dilapidated infrastructure corridors on rapidly urbanized agriculture tracts in many other parts of the city along stretches of informal development, transforming peripheral conditions into central green arteries.

The project's planning concept is thus anchored in the larger question of informal development in Cairo, and aims at addressing a complex set of planning issues on multiple levels that would transcend immediate local needs of Ard al-Liwa. The project also positions itself within the newly emerging urban order, whereby individuals and communities are taking the initiatives, then inviting professional and planners and policy makers on board, thus challenging the former models of 'citizens participation,' and redrawing the balance between the state and its urban citizens.

Negotiation with the Authorities

The initial stages of the design process involved intensive sessions and workshops with local community representatives to develop a program for the project and translate their needs and aspirations into a design brief.

[9] CLUSTER: Cairo Lab for Urban Studies, Training and Environmental Research is an urban design and research platform based in downtown Cairo.

Once a preliminary conceptual design was ready for discussion, the next step involved a series of meeting with stakeholders, local and governmental authorities, as well as international development agencies and potential donors. Each time the process of approval gets stalled, due to a change of cabinets or because of political turmoil, talking to media proved very useful to increase pressure on authorities.

The scope of design process followed a number of stages, including a) identification of all previous studies for the site and surrounding context; b) developing a design brief through a number of participatory workshops with community groups and translating their needs and aspirations into an area program; c) establishing a broader conceptual framework for the site and surrounding context, on local, district and city scales, each to address a number of planning issues and specific design priorities.

Due to the site location and its immediate juxtaposition to a number of infrastructure lines, the formal approval process had to be negotiated with multiple ministries and authorities, such as the Ministry of Housing, the Ministry of Transportation, the Ministry of Irrigation, the Ministry of Awqaf (Religious Endowments), and the Ministry of International Cooperation, as well as the General Organization of the Physical Planning, which has to ratify any future plan in accordance with its own strategic plan of the area, and the Giza Governorate, which will eventually be the owner of the Park project. For negotiating approvals and exploring funding possibilities, representatives from the community and the design team organized a number of meetings with local authorities whose stakes in the project may facilitate or otherwise block such unconventional bottom-up initiatives. The team also explored preliminary fund-raising possibilities by engaging key national and international agencies with specific interest in the development of informal areas.

One of the main challenges facing the formalization process in this project has been the fast-changing political landscape. During the past 18 months, Egypt witnessed three cabinets, changing governors and three national elections for both assemblies and the presidency. These changes, often coinciding with major turmoil on the ground ranging from rallies to street battles and burning of public buildings, were often accompanied by shifts in political ideology or at least government's attitude and priorities towards projects of this size. This in turn has often resulted in stalling earlier momentum for approval and formalization of the project. Conversely, each new cabinet tried to repackage ongoing or potential project under its platform of development. The *Nahda* (Renaissance) program by Freedom and Justice Party is a case in point.[10]

Architectural Expression and Landscape Strategy

In addition to the basic planning premises outlined above, and once a preliminary master plan was approved by the highest political authorities, it became clear that such conceptual design scheme is not very useful to communicate with local communities and engage different forms of media.[11] In order to develop an architectural expression that could be presented to a wider public beyond the circle of experts and official, the planning team embarked on a process design development of architectural and urban forms derived from local context.

[10] Under *al-Nahda* program, members of Freedom and Justice Party have forming committees in professional institutions, inviting those with "success stories" to present their ongoing projects or potential visions for development. Many of these have been re-presented to the public as part of FJP's program.

[11] On July 25th 20102, Prime Minister El Ganzoury approved the Park Project and instructed in the ministries and authorities involved to work all administrative details, such property swapping, custody transfer, financial allocation, infrastructure considerations.)

This process involved analyzing and decoding the elements of the architectural language of informal urban conditions through a multi-level framework, including the urban block, the typical architectural unit, as well as detailing features. In addition to engaging local modes of architectural expression, the study also aims at a critical understanding of the agricultural and landscape development in informal areas.[12]

Starting with urban scale, the first level of analysis focuses on the housing block, and investigates the process of formation of this fabric whereby the patterns of the irrigation grid and land subdivisions inform and often offer a guiding principles for residential areas. Most of the identified patterns are more or less rectangular. And it is common for individual agricultural parcels to be as small as one *qirat* (175 square meters). Multiples of holdings are normally arranged in small irrigated agricultural plots, with strips separated by small irrigation channels. These channels become then converted into access lanes separating urban subdivisions. Larger irrigation and drainage canals link these rectangular strips, and often have dikes on both sides reserved for pathways and for canal cleaning. As development in an area intensifies, these canals are eventually filled in and become the main streets, serving as both traffic collectors and major commercial and service corridors.[13]

Identified urban patterns, including block size, street network, and hierarchy of services, are thus primarily based on the agricultural and irrigation grids, generating such highly dense and expansive informal settlements. The urban subdivision of narrow rectangular plots also generates a somewhat standardized apartments building type. This typical block is then analyzed in terms of footprint, number of facades, light wells and ventilation systems, heights and number of units, as well as proportion to street width and other neighbouring open spaces.

Finally, the study aims at identifying key architectural detailing features that would capture the character and aesthetic vocabulary, starting from typical windows, balconies, stairwells, and skyline as well as generic elements defining the roof-scape, such as minarets, pigeon towers and satellite dishes. The process of learning from the informality intends to help develop an urban language and modes of architectural expression sensitive to its surrounding context—one that would capitalize on the process of accretion and millions of trials in such rich reservoir of local knowledge. In so doing, it hopes to offer lessons and performance-based standards that could then be further tested and systematized, potentially contributing a to a contemporary urban and architecture language in Cairo.

Conclusion

Ard al-Liwa Park Project offers an opportunity to engage new modes of practice as well as alternative forms of urban and architectural expression. On the one hand, the process whereby the project was conceived, negotiated, and approved, defies the classic "participatory planning" as well as the hailed public-private partnership (PPP) models. Instead, it suggest an a framework whereby the community takes the initiative, proposes an alternative vision to governmental plans, then invites architects, planners, and policy makers on board, in a truly bottom-up model of development.

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[12] While informal development in Cairo has taken place on both the desert land and the agricultural land, the scope of the above study focuses on those built on agricultural land, which accounts for around eighty percent of all informal developments. Ard al-Liwa exemplifies a typical case of this typological pattern. See Sims, D. (2003), The Case of Cairo, Egypt, in United Nations Human Settlements Programme (UN-HABITAT) & UCL Development Planning Unit (Eds.) *Understanding IA: Case Studies for the Global Report 2003*, (Cairo: UNDP

[13] For more analysis of this urban typology on agricultural land, see Elkadi, G. (2009), *Al-Tahddur al-'Ashwa'i* .(Cairo: al Majlis al-A'la lil-Tarjama wa-al-Nashr) and Sims, D. (2010), *Understanding Cairo: The logic of a city out of control.* (Cairo: AUC Press)

Secondly, the strategic location of the project straddling the formal-informal divide provides a rare opportunity for planning interventions that would not only respond to many of the needs lacking within underserved informal areas, but also potentially help restructure the distorted relationship between formal and informal parts of the city, from one of dependency, marginalization and exclusion, to one of integration and interdependence.

Lastly, the project attempts to offer a platform to test new urban and architectural language that are distilled from the reservoir of local knowledge and building tradition in informal housing areas. Such tradition has for decades been dismissed as illegitimate and chaotic. If implemented, Ard al-Liwa project could potentially stand as an example for an urban revolution in the making.

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Empowering people in Egyptian informal areas by planning: towards an intelligent model of participatory planning

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Over the past thirty years, Egyptians living under poverty line -as in informal areas- have been largely marginalised, and were far from any participation in the decision-making process. Hence, The 25th of January revolution was brought to light by Egyptians from different ages, gender, social levels and education backgrounds. They shared one dream; to enhance their living conditions, live with dignity and acquire freedom. Empowering people and an effective participatory development will support this process of democratic transformation and socioeconomic development for their communities, rethinking their new role in the whole community and understanding of democracy among them. Therefore, Social cohesion and practice democracy is the main focus of this paper aiming to integrate citizens into the planning and decision making process. This is achieved through on –site interviews and is concluded by a model of the participatory planning and empowerment process in the informal society.

Keywords: Egyptian revolution, Participatory planning, Social cohesion, Empowering people, Intelligent model

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Introduction

Informal areas are a global phenomenon that have amplified on a long term and increased dramatically especially in the global south cities. In Egypt, informal areas emerged in the 1960s and inflated enormously in their distribution inside and around the urban mass. Greater Cairo, as one of the metropolitan cities, with almost 17 million inhabitants (Sims, 2009), contains a vast number of informal areas of more than 40% of the GCR urban mass.

The increase of the rural migration to the centralised Cairo, and the saturation and limitation of the formal housing contributed greatly to this phenomenon. The annual increase of the informal areas makes addressing this issue a must. Residents of informal areas, in Egypt, suffer from the lake in the basic urban services (among other; clean water supply, electricity and sewage). Lately, the government has started to take into account such basic demands especially after the collapse of the Dwaika Rock in 2007, in Mansheat Naser.

This paper comprises 3 sections: Section 1 reviews the literature on Informal areas in Egypt and especially in Cairo. It goes through the various interventions from the government, national and international NGOs, and the regulations of planning in Egypt. Section 2 reviews policies and concepts of public participation, empowering people. It includes an interview discussion conducted as an exploring tool towards empowering people in Egypt. Section 3 describes the PP intelligent model towards empowering people and establishes an effective participatory planning process. Finally, it ends with concluding remarks.

Informal areas or slums

The term 'slum' not only suggests indecent and miserable living conditions but also implies other important aspects such as informality (The World Bank and UN5CHS (Habitat), 2000). Slum refers to a residential area inhabited by extremely poor people, who have no land tenure and are characterized by low quality or informal housing.

Buildings, found there, can vary from the simplest shack to permanent and sometimes unexpectedly well-maintained structures (Carrie, 2009; UN-Habitat, 2003). Another explanation is that this term is an umbrella concept under which fall numerous categories of settlement, e.g. decaying inner-city tenements, squatter settlements, informal settlements and shantytowns. (The World Bank and UNCHS (Habitat), 2000) (See also Khalifa, 2010).

Egyptian slums – Background on informal areas in Egypt

After World War II and later on the 1952 Revolution, Cairo's expansion accelerated and acquired new features under a socialist government (Sims, 2003) With the years of wars in 1948, 1967 and 1974 that followed, informal urban development has become the defining feature of Cairo's growth and its urban change. Another main driving force was the shift from an agriculture-based economy to an industrial- and service-based economy (Shehayeb, 2011). This background gives the real incidence of '*Ashwaeyat*'[3] (Khalifa, 2011).

[3] The Egyptian Definition of the (Informal Area): The term "*Ashwaeyat*" is the only one used officially to indicate deteriorated or under-served urban areas. It actually means "random", implying that these areas are unplanned and illegally constructed. Thus they are not necessarily slums, although being informal/ illegal, they tend to be the least well served in terms of infrastructure and public services, and they suffer from poor accessibility and high levels of overcrowding. (Sims, 2003) The coverage of settlement types is complex within the context and variety of equivalent words in other languages and geographical regions, such as Favelas, Kampungs and Bidonvilles. (The

Year	Existing Agglomeration		Pre-urban **Cairo** Mostly **Informal**	Desert	**Total GCR**	GCR Annual Increase	Per cent Informal In Cairo Proper	Per cent Informal In GCR
	Formal Areas	**Informal Areas**		Cairo		%		
1947	2,400,242	0	586,038	0	2,986,280		0.0 %	10.2 %
1960	3,905,670	100,00	955,166	0	4,960,836	3.98	2.5 %	15.6 %
1976	4,610,326	1,969,000	1,374,317	0	7,953,643	2.99	29.9 %	38.1 %
1986	4,650,000	4,248,866	2,063,376	32,615	10,994,857	3.29	47.1 %	54.5 %
1996	4,807,632	5,436,477	2,857,468	149,992	13,251,569	1.88	53.1 %	59.7 %
2006	5,005,824	6,742,416	3,942,262	601,767	16,292,269	2.09	57.4 %	62.8 %
2009	5,038,763	7,155,106	4,345,567	**800,952**	17,340,388	**2.10**	58.7 %	63.6 %

Table 1: historic growth of component parts. Source: Sims, 2011

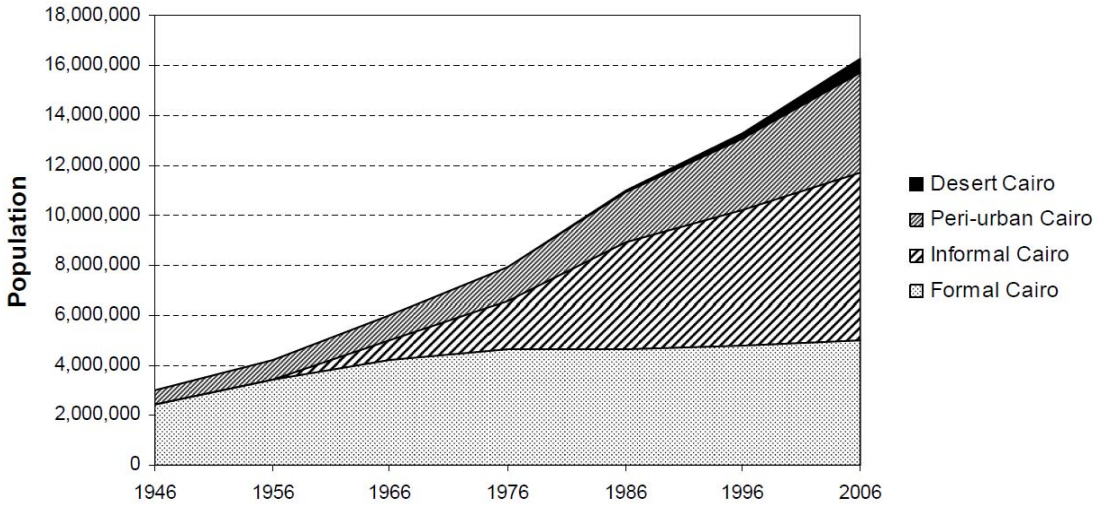

Figure 1. Growth of component parts (Sims, 2011)

Housing demand was still growing because of the high demographic growth and change. The populist housing[4] policy, implemented by Nasser particularly in Cairo, was also inadequate for creating shelter for low-income families and the cohort of migrants rushing there. (Séjourné, 2006) Thus the middle and lower classes found the informal sector an adequate alternative to fulfil their needs.

World Bank and UNCHS (Habitat), 2000) (See also Khalifa, 2010) Egypt's informal settlements (called "*Ashwaeyat*" *or* "random" zones in Arabic) are ubiquitous in both urban and rural areas. They are illegal, or extra-legal, in that they breach one or more laws regulating planning, subdivision, construction, registration of property, or preservation of agriculture lands. (The Cities Alliance, 2008) The term "*Ashwaeyat*" *has* also become a synonym for slums in unofficial or popular language, and it carries a pejorative connotation. Government officials and the national press frequently see these areas as "black stains" and ascribe to them a whole set of social ills – crime, drugs, and 'backwards' behaviour. (Sims, 2003). A more operational definition is used by municipal authorities to define *Ashwa'iyyat*, as "Residential areas characterized by being developed in contradiction to planning and building laws and regulations in the absence of state's supervision. They, in essence, might lack services and/or infrastructure" (General Administration for Planning and Plan Monitoring, 2008: 1).

[4] The populist (low-income) housing is public housing called masakin sha'biyya and cooperatives.

After 1975, Sadat engaged the country in a new direction, namely the Open Door Economic Policy *(Infitah)*[5], the government was the only responsible for the construction of low-income housing, and private sector would have the primary responsibility for providing their housing units. (El-Batran & Arandel, 1998). Since the 1980s, almost no more new informal areas have appeared, however, the growth of the existing ones has not slowed down in spite of the fall in population growth rates and the strict legislations[6] from the government. (Khalifa, 2011) Thus, informal settlements were the only available solution for the poor (Hassan, 2012) and it led to the change in the social conditions because of residential migrations. (Bayat & Denis, 2000).

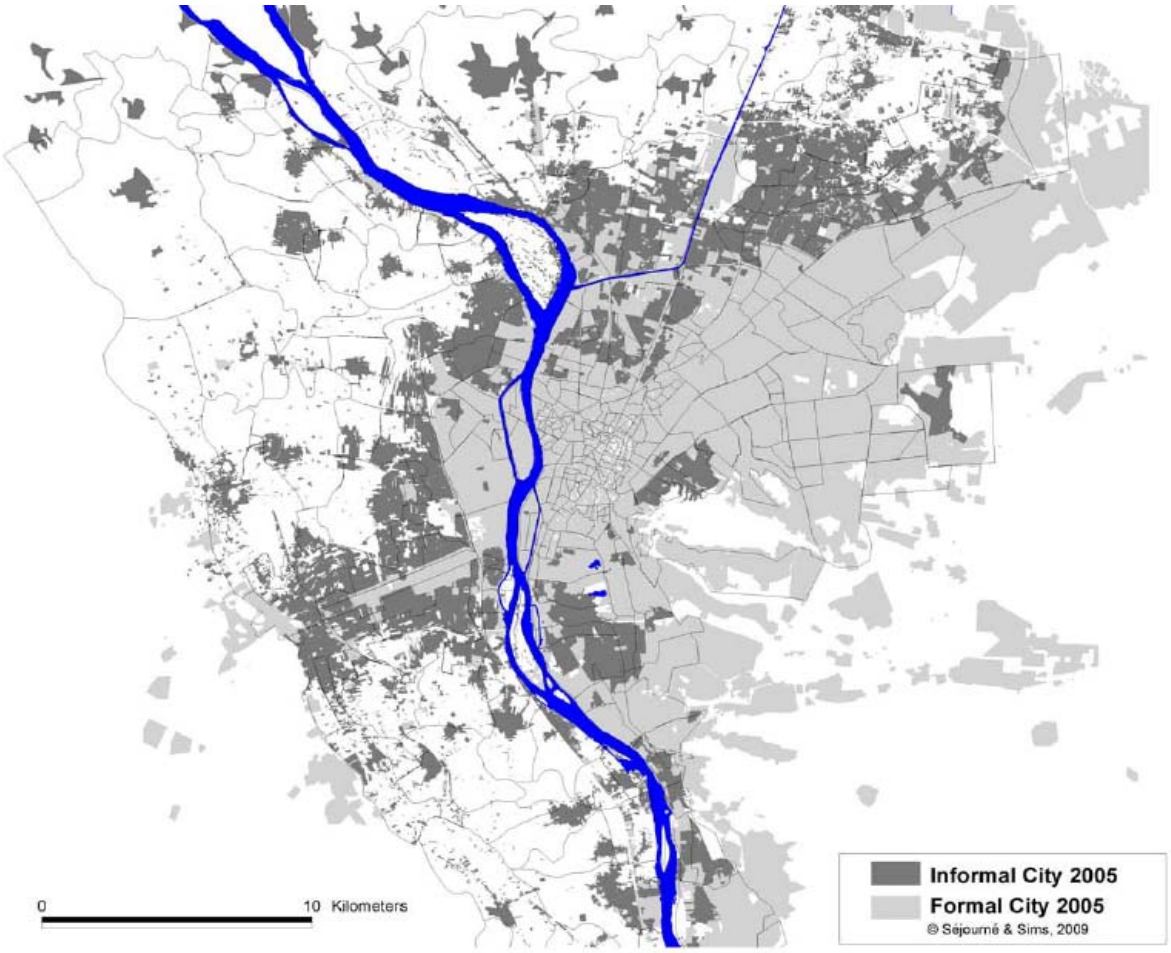

Figure 2. Growth of component parts (Sims, 2011)

[5] The Open Door Economic Policy (*Infitah*): this newly developed policy is marked by a greater political and economic opening to the west and a move away from a state controlled economy towards a market economy. With regard to housing, In addition, the state disengaged from the production of rental housing and maintained the policy of rent control with only minor modifications.

[6] The government took Strict measures against illegal urbanisation were in form of Military Decrees 1 and 7, which forbids encroachment on agricultural land. (Khalifa, 2011).

Regime systems in Egypt since the 1952 revaluation

The previous historical insight on Egypt's political background reveals that, Egypt was ruled since the military revolution after King Farouk in 1952, by an autocratic regime. Four presidents ruled Egypt over the last six decades, Mohamed Nageeb from 1952, Nasser from 1954 until his death, Anwar Sadat from 1971 until his assassination, and Hosni Mubarak from 1981 until his resignation in the face of the 2011 Egyptian revolution. The political system in these sixty years can be described as a dictator system under military base.

After January revolution, the political changes that happened and continue taking place, intend to build a effective democratic system, release the centralisation of decision making '*decentralisation*[7]' and build trust and reliability of the others. These changes should influence the future of the planning policies as well as integrate people, who were marginalised over six decades.

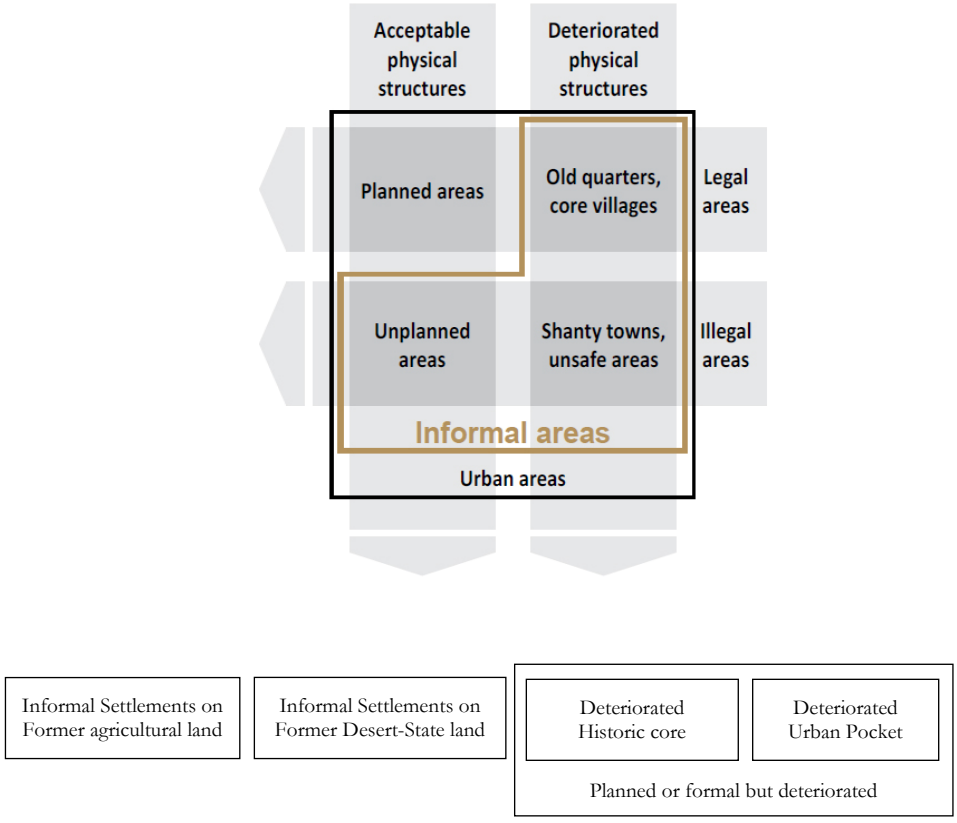

Figure 3. Classification of urban areas according to legal status and physical condition (GTZ, 2010)

[7] Decentralisation is prerequisite to participatory development but in turn requires new administrative functions that have to be institutionalised in the structures and operations of local governments. Decentralisation of decision-making power and resources from central to local authorities allow policies to be more targeted towards local needs and thus development measures to be more locally efficient and cost-effective. (GTZ, 2010)

Authorities of informal areas in Egypt

I. Governmental bodies responsible for informal areas in Egypt. It is essential to define the different authorisation responsible for these areas. The Ministry of Housing represented in the general organization for physical planning is the State authority responsible for informal areas. After Dewika accident, in 2008, Informal Settlement Development Fund (ISDF[8]) was established and has become responsible for informal areas, including development and upgrading plans. However, GOPP is still the administrative body for the development plans for the unplanned areas, as deteriorated urban areas in the historic Cairo. Significantly, ISDF did a classification of the informal areas in Egypt into two types; un-planned and unsafe[9] areas. Most of the interventions and funds are dedicated to the unsafe area, due to financial and priorities issues. (Fig. 4).

Unplanned areas	**Unsafe areas**
Unplanned areas are 60% of urban areas. Density 500 person/ feddan. Building heights 4-10 floors. Provides optimum level of safe housing. Needs long term development.	Unsafe areas are 5% of urban areas. Density 200 person/ feddan. Building heights 1-2 floors. Doesn't provide safe housing. Needs immediate intervention.

Figure 4. Difference between Unplanned areas – Unsafe area according to the ISDF definition (ISDF, 2012)

II. Planning regulation in Egypt: Egyptian law. Building Unified Law # 119/2008 (6) includes all definitions related to planning and urban development. The term '*Ashwa'iyyat'* has been removed from the law and replaced by unplanned and unsafe areas referring to ISDF. Nevertheless, special planning issues for these areas do not exist. However, in this law, the Government incorporate the issues of community participation (Madbouly, 2006).

Essential planning regulations and codes for informal areas in terms of participatory planning and depending on this classification of ISDF need to be defined.

III. Informal development planning programmes under the last regime. Different governmental authorities had tackled, in the past (1970-2008) various interventions towards informal areas, just before establishing of ISDF. This part is also to review other interventions in this period with cooperation with international association. By the late 1970s, the governmental bodies, the World Bank and other international donors supported various pilot projects in "sites and services" and settlement upgrading (El-Batran & Arandel, 1998).

[8] ISDF – Informal Settlement Development Fund, a new governmental authority: In October 2008, a presidential Decree # 305/2008 established the ISDF with the main objective of coordinating efforts and finance for the development of what were formerly called "Ashwaeyat". The ISDF is directly headed by the Egyptian Cabinet. It is managed by a management board which is formulated by the Minister of Local Development (president) and has a membership of 6 Ministries, 53 experts and 3 representatives from civil society organizations, the private sector and NGOs. (Presidential Decree, 2008)

[9] Unsafe areas, defined by ISDF, are characterized by being subject to life threat, or having inappropriate housing, or exposed to health threat or tenure risks, while unplanned areas are principally characterized by its noncompliance to planning and building laws and regulations.

Until the 1990s, urban development policies treated informal areas as a specialised phenomenon, either focusing on particular pockets, or on simply redressing the shortfall in urban services in larger informal agglomerations e.g. Ezbet El-Haganaa. The government initiated a National Program of Urban Upgrading (NPUU) in 1992 (The Cities Alliance, 2008) as a response, when informality started taking a great presence. In 1993, The National Upgrading Program (NUP) for Informal Settlements directs upgrading projects relating to the diagnoses of urban problems.

Subsequent governmental interventions till 1994, on one hand, aimed to upgrade informal areas by providing needed services and amenities. The provision of infrastructure, as a result, had encouraged the more growth of these areas (Hassan, 2012). On the other hand, a national strategy was formulated by ministry of housing to define ways of intervention in preventing the formation of new informal areas (Madbouly & Lashin, 2003). From 2004 till 2008 Informal Settlements Belting Programs was launched to restrict the growth of informal areas (Egyptian Cabinet, 2011). Most of these Programmes based mainly on Top Down strategies, only since 1998, GIZ had initiated a Bottom Up strategies by applying Public participation development programmes (Fig. 5).

With the catastrophe of Deweka and respectively with the establishment of ISDF, informal unsafe areas are going to be ordered according to the degree of risk. Based on the ISDF the initial estimations of unplanned areas constitute 60% of total urban area, while unsafe areas constitute 5% (El-Faramay, 2011).

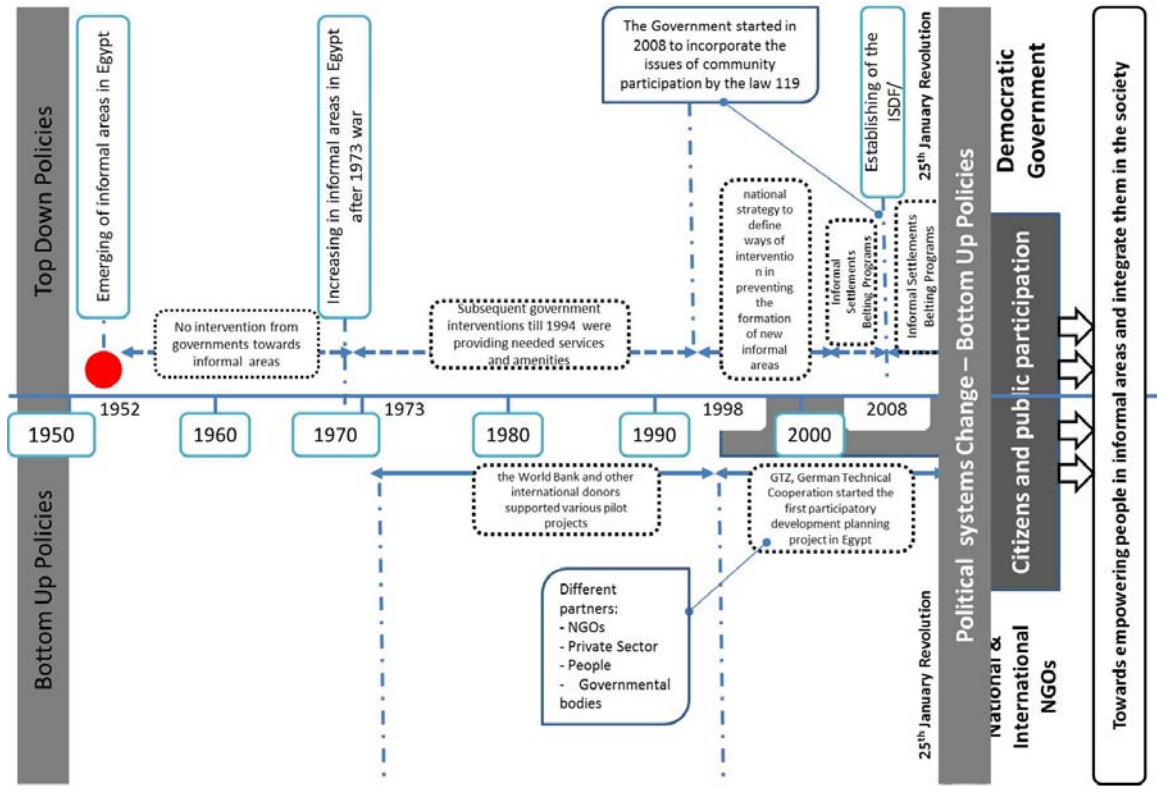

Figure 5. Time line of the informal areas development plans and interventions since the revolution of 1952 and the emerging of informal areas in Egypt and till the revolution of January 25th

Participatory planning by empowering people

Public participation in theories and practice

Public participation is a shift to democracy and to share in the decision-making to meet the citizens' needs and dreams in their neighbourhood. It helps empowering people as well as empowering the planning process.

An explosion of the interest in participatory development programmes (PDP) has occurred over the past decade. Participatory approaches emerged in 1980s out of dissatisfaction with the then dominant expert–based, externally imposed and top down conventional planning in the urban global south (Maru, Alexandridis, and Perez, 2009). Jamieson (1987) was one of the early recognisers of participation in planning as a new paradigm (Shalaby, 2011). Jamieson approached the shift from conventional planning into planning with participation. Another shift was of Top-Down[10] Planning process into Bottom-up[11] ones (Fig. 6); from being 'Planning with public participation' into 'Participatory planning PP'. In 1994 Robert Chambers, a leading proponent of PD listed a range of areas where participatory rural appraisal (PRA)[12] methodologies were already being experimented (Chambers, 1994a). Christopher J.N. Gibbs (1985) confirmed that RRA is not a standardised method but attempts to be systematic in order to be replicable.

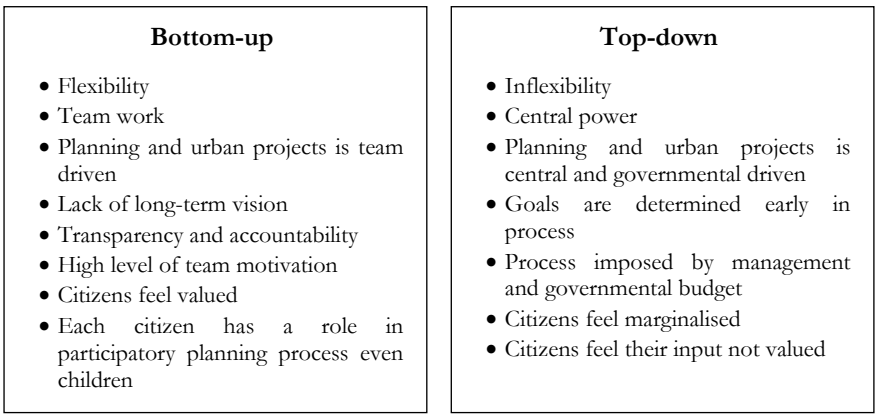

Figure 6. Difference between Bottom up – Top down planning political systems

[10] Top-down planning policy is referred to as strategy. It is focused on keeping the decision making process at the governmental and central level. Goals and quotas are established at the highest level, and those at the top are not often willing to take advice or any guidance from lower level bodies.

[11] Bottom – Up planning policy is referred to as tactics. With bottom-up planning, the process will get deeper focus because of the high number of participation in the decision making. Each group in the whole system can be involved with their own area of experience. Teams are working side by side and have input during each stage of process. Planned are developed may be at the lowest level and then passed on to each next higher level to get feedback.

[12] In the 1980s, the shortcomings of externally imposed, donor-driven development strategies became evident. In an attempt to deal with the unsatisfactory results of top-down approaches, Robert Chambers, in his work on Participatory Rural Appraisal and Participatory Rural Development, suggested a shift towards a more participatory approach in development projects. (GIZ, 2009) The Rapid Rural Appraisal has been practised in large number of agricultural organisations and rural areas to diagnose topics or locational problems (Grandstaff and Graridstaff, 1985), to plan technologies appropriate to farmers (Byerlee et al., 1982), to reorganise agricultural administration (Klepper,1980), to plan projects (Ellman, 1980), and through the use of the sociotechnical profile to equip bureaucracies for participatory work (de los Reyes, 1984 in Khon Kaen University, 1987).

The most significant shift over the 1990s has been that participatory discourse rapidly became part of the official aims and objectives of governments and international development agencies (WR, 2001). Despite the varied mechanisms of participation, Williams (2004) mentioned that most of the successful examples[13] reveal a political evolution by adapting systems and produce a fuller and more active sense of citizenship.
This paper shares with different *theoretical writings* the notion that all citizens can and should get a role in defining their needs, methods and even set priorities for planning their neighbourhood. (e.g., Freire 1970, Chambers 1983; Conway 1985, Hamdi and Geothert, 1997, Mohan & Stokke 2000, Williams 2004, Halim 2005) However this paper aims to define a model for participatory planning in Egypt as a tool to empower people by planning and creating plans managed by them and that can proceed controlled and sustained by the citizens in the future.

Participatory Planning in Egypt

Public participation in Egypt has historically been attached to the issue of national liberation, an issue of highest priority until the evacuation of British forces in the 1950s. (Abdel Halim, 2005) However, since that time, real participation did not take place because of socio-economic factors including cultural and historical traditions as well as the political and regime systems. The breeze of democracy after the revolution opens new channels and paves the road for a new futurism and real participatory planning. GTZ, German Technical Cooperation (GIZ nowadays), was one of the first initiatives in participatory development planning project in Egypt. GTZ assets number of partner ministries as well as the Governorates of Cairo, Giza, Qalyoubia and Helwan in developing and implementing participatory upgrading mechanisms. They selected two informal areas in region Cairo as pilot projects, namely; Manshiet Nasser and Bulaq Al-Dakrour. The initiation started since 1998 on these cases, and has been conducted on three phases. (Fig. 7).

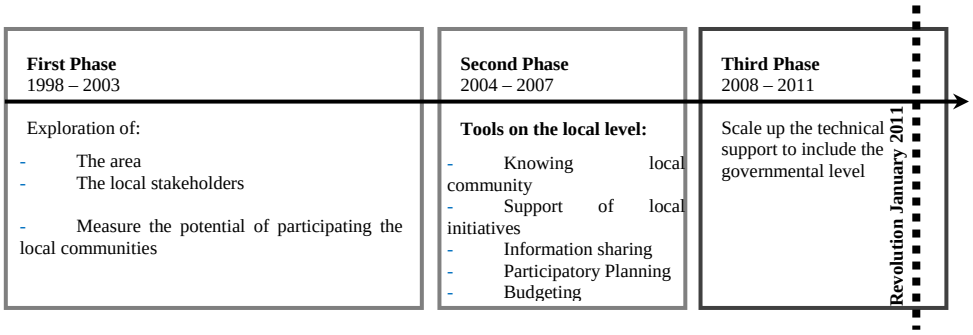

Figure 7. GTZ Manshiet Nasser PDP Project Phases.

[13] Williams (2004) mentioned some positive successful examples of participatory development (PD) within different context: (within India, the People's Campaign for Decentralised Planning in Kerala (Heller, 2001), mobilisations around Maharashtra's Employment Guarantee Scheme (EGS) (Joshi & Moore, 2000), and the MKSS (Mazdor Kisaan Shakti Sangathan) right-to-information campaign in Rajasthan (Jenkins & Goetz, 1999)). Kerala's experiment was explicitly state-promoted, and combined a significant transfer of government resources with mass mobilisation through the Kerala Popular Science Movement. The Maharashtra's EGS was initially a welfare-for-work scheme that invited a degree of micro-level participation, but over time led to the wider politicisation of rural unemployment as an issue. The MKSS by contrast uses popular participation through events such as jan sunwais (public hearings) to explicitly challenge the state's official development records and uncover institutionalised corruption.

Abdel Halim mentioned in GTZ's Report (2009) that PDP promotes an inclusive model of participation on the local level, urging participation of all local stakeholders, including district administration, the popular council, NGOs, local businesses, and natural youth and women leaders. GIZ, however, he believes that the globally-accepted triangle model (Fig. 8) of participation between Government, Private sector and the civil society Organisation (NGO) representing community cannot contribute to community empowerment or the objectives of the participation. Although this global model was accepted by the Egyptian government, and the political leadership, Abdel Halim explained this dissenting opinion, that NGOs in most of the cases all over Egypt do not truly represent the civil society and that they do not have a clear or comprehensive agenda of development. In the last phase (2008 to 2011) technical support to include the governorate level has been scaled up[14].

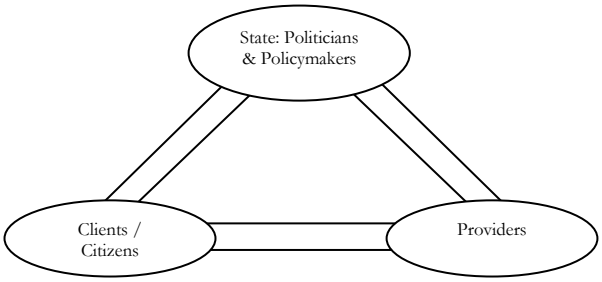

Figure 8. Participatory Actors Triangle; Private Sectors and providers (NGO communities), Governmental and political bodies, and citizens and local municipality

The GIZ experience of the PDP, in these pilot projects, cannot be classified as a sustainable process when governmental support is continuously used as a tool to facilitate and mobilise the process or even to issue decrees supporting localised participatory mechanisms. It is here once again a centralised decision and a one-way power of decision-making. This is not a critique of the model itself, yet a critique of importing a foreign model and trying to adapt them to the Egyptian government (the central powered entity), which causes an unbalanced participation process. Once the facilitator of the PDP disappears the system of the PP will not function. It is thus not a sustainable participatory planning process.

Exploring tools towards empowering people

Based on the findings of the previous review, the PDP process did not continue after the GIZ left these areas. As a feedback, citizens from Mansheat Naser have been asked about: The benefit they gain from the program of the public participation of the GIZ project and the sustainability of the program. They reported that they do not feel empowered after 13 years of this programme and they still cannot trust the government. Hence, an interview with some citizens (Singles and Families) from other informal area in Cairo, namely Ezbet El-Hagana, has been conducted.

[14] Abdel Halim (in GIZ, 2009) argued that: '.. these participatory tools may sound for the development or upgrading of an area, in reality there is a limit to what can be achieved on the local level alone. PDP's experience in the pilot projects demonstrates that the governorate level is pivotal in empowering and supporting local participatory development processes....'.

I. Interview with citizens exploring the ability of participation after revolution. Participatory methods have been used increasingly instead of interviews or questionnaires to identify target groups or to monitor and evaluate its mechanisms. Yet, in order to build a common understanding of the needs, attitudes and acceptance of residents of informal areas towards participation in planning with the government, an interview was conducted in Ezbet El Hagana. This interview aims to explore the ability of participation as well as the level of empowerment gained through the planning process.
The selected sample was a mix from different ages and both genders. The interview is to measure mainly five points; *first,* how much are they satisfied with the facilities provided by the government?, *second*, if they are willing to build trust with the new government? and to what extent can they work with them or their parties as representative?, *third,* what are their perception towards their role in and towards their community?; *Fourth,* do they believe that they are an effective part in it or there is no willing to play any role in the planning process*; and fifth*, how much the changes that took place after the revolution will reflect on their way of life and into the participatory planning process?

II. Results and facts of this interview. Most of the interviewed persons do not feel belonging to the whole community; they suffer from services and lack of facilities and insufficient infrastructure. People do not trust the government as this is a preconception formed through the past decades before the revolution. The government's common solution of informal areas is to get rid of them and remove them out to the satellite cities. Citizens are convinced that government are against their existence. From point of view of some inhabitants, NGOs are not the only representatives of citizens. Many of the citizens have the willing and ability to share and would play a role for the future. The political parties did not play a role in the past; yet, citizens feel that the newly elected parties might play an essential role in their life and that they can now represent them. People are still feeling marginalised before and after the revolution. However, the interviewed citizens emphasise and believe that they are the right ones who can assess their requirements and local problems. Based on this interview, a unique intervention and an intelligent model of public participation are needed. This model must face all previous obstacles and must reflect the perception and expectation of people towards an effective participation planning.

Empowering people
Power is a conceptualised term with different relations and conflicts. Empowerment of marginalised groups requires a structural transformation of economic and political relations towards a radically democratised society. (Mohan & Stokke, 2000) Williams (2004) elaborates on participation's potential to develop '*a new political imaginary*' of empowerment. Once empowered in *the pre-phase*, stakeholders will be active player in the *participatory planning process* and get integrated within the social and political systems, ensuring for them the enjoyment of full citizenship rights and enabling them to take part actively in national decision-making and in the allocation of governmental resources. (see also; Piffero, in GIZ, 2009).

I. Redefine social, economic and political structures as key issues. In order to empowering people, a comprehensive data-base has to be produced. This database is of *social*, economic *patterns and behaviours, and political systems to* figure out the key method to deal with this community. This entire infrastructure database is essential to assess the requirements and to identify the sustained level of activity in the social, economic and political education. Also it is an important indicator whether young people stay in the area when they

got married or they live elsewhere. The long history of informal areas and their background of being formulated basically by immigrants give these areas significant socioeconomic characters and structures:

- *Social infrastructure and potentials: The size and type of the present and projected population* is an important data input to assess housing adequacy and calculate the future housing demand. (RPS, 2008) Population count gives an indication of the lack of public facilities and services. Among other indicators are, *age- sex distribution*, *population pyramids* (young and old) and the *demographic distribution*, *types of families*, *types of households* and in general the *population growth rates*, *population distribution, densities and occupancy Rates. Population projections* is further crucial information in any planning exercise concerning who will be included in the PDP?, and whether it will be sustained or not? The population distributions and origins give an important dimension to the groups' clusters and the division into homogenous groups. It is emphasised that the *social structures and profiles* in most cases show an intern *cohesive society*. This *strong structure* is considered of *high potential* in informal areas as a 'social capital' with respect to their social characters and mechanisms that help addressing a sustained process and the best results of participatory planning.

- *Economic infrastructure and potentials:* unfortunately, it is obvious from other experiences as Abdel Halim (2005) reported that the most economically depressed categories of society are the least willing to participate politically in order to change their circumstances. However, Informal areas have an economic value[15] as a potential which is underestimated and underused because of their illegal status. This is not only in terms of their hidden market investment, but also in terms of their use value for residents by living in such areas. (GTZ, 2010) Informal areas are not inhabited only by the poor; residents include government employees, workshop owners, artisans, as well as professionals such as doctors and lawyers. Household income as well as the location of employment paly a great role in the self-belonging to the area and the services needed there. Informal areas are almost *self-dependent communities* and have very *strong economic structures*, although they are built informally or illegally. Representative people elected locally lead the management process for the whole area. High rations of *skilled people* as well as *the high number of population* as *human resource* are great *potential.*

- *Political infrastructure and systems:* Egypt's political systems is coloured by a number of elements, the weakness of political parties and the novelty of civil society, education, and the media. (Abdel Helim, 2005) *Under democratic systems*, many of the *legislation related to public participation and political parties* need *to be passed* in order to deepen democratic practices. Liaise with all parties is the key element to reach out to citizens. *Strong, homogeneous and stable structures* of the communities are the key issue to target and empowering people for planning. Social aspects are crucial element that must be taken in to account. Politicians and their representative parties have to work on using attractive methods and clearer programmes. *The participatory process can stay mobilised and sustained* only if all these social, economic, and political axes and infrastructures interacted together especially on the social level, by: (i) establishing networks

[15] Informal areas have an economic value: It was estimated in the late 1990s that the 'dead assets' in urban areas in Egypt – land and housing informally registered and/or illegally developed – sum up to 195 billion US Dollars in addition to 2.4 billion informal businesses (De Soto, 1997 in GTZ, 2010).

from the social capital, (ii) developing the educational process, (iii) raising the profile of human rights; on the economic level, by: (i) using values of the hidden market and investments, (ii) enhancing economic performance, (iii) developing/ use the media in marketing the process; on the political level, by: (i) decentralisation of decision making, (ii) improving political party performance, (iii) updating and passing new legislation.

II. Crucial key element for empowering people and the planning process. In order to operate the process to be sustained, mobilised to tackle challenges and to enable communities as well as politicians feeling of the change, a list of crucial key elements must be fulfilled, as following:

1. Ensuring transparency, credibility and accountability[16]
2. Two-way learning process
   a. Understanding Democracy together
   b. Raise citizens, NGOs, Political parties awareness
   c. Exchange of information
   d. Productive team work
   e. Envisioning the future
3. Meet the needs of citizens and put them in priorities
4. Increasing youth, woman as well as *children* involvement and the levels of education and awareness.

Furthermore, setting the clear goals with timelines, where each goal is going to build on what has already been done. Likewise, transparency between all parties and stakeholders allows communication and dialogue, hence promotes participation of local stakeholders in a sustained development process. This refers to processes and decisions that are made accessible to the public and easy to understand and monitor.

Intelligent model for PP

The previous literature review of participatory planning in Egypt and the outcomes of the interview with some citizens of a selected informal area emphasis the following:

1. Public participation should not be a one way relationship between government and citizens, yet it should be an interrelationship.
2. Before involving people in the planning process, empowering them is a must.
3. Current techniques and tools used in the PP need to be restructured especially under new political systems.

In order to achieve that the research advocate a new intelligent PP model that engage and empower people and link them with the government. Empowering people with this regard is as vital part of democratic governance and considered as a foundation base.

[16] Accountability is an important element of good governance according to which the government on all levels is held responsible for its actions by its citizens. Therefore, the local government needs to be transparent and communicate effectively with local population to ensure they understand its decisions and actions. The same applies to other local stakeholders such as NGOs and managers of public services that have to stand up to local public inquiry. Acting upon the results of practicing accountability by rectifying procedural or financial shortcomings requires decentralisation of liabilities to the local level. Accountability is a key to participation as it emphasises trust among local partners based on information sharing and tangible evidence. (GTZ, 2009)

The matter of being *intelligent* is that this model is produced for the Egyptian informal societies, however, will be adapted in other contexts depending on each case. Importing PP models from the western society will not work. Political systems and backgrounds are totally different. The model is to be a platform and prototype concept for the Egyptian slum cases.
The planning process in terms of this intelligent model should be proceed on three axes: first axis; *Building bridges of trust and transparency* and second axis*; the two-way learning process*, *and third axis; emphasise the social cohesion and the local skills* with effective local municipalities. These three intersected axes will be practiced using *awareness programmes, workshop and handicraft small sessions and activities* by *locating them in a meeting point / space & place of assembly, where* the activities can be conducted and people can introduce themselves. This place will bring them all physically and mentally together; e.g. for quarter-board, democratic participation, polling place, cultural events, and families free time. This will ensure the mobilisation and sustainability of the PP.

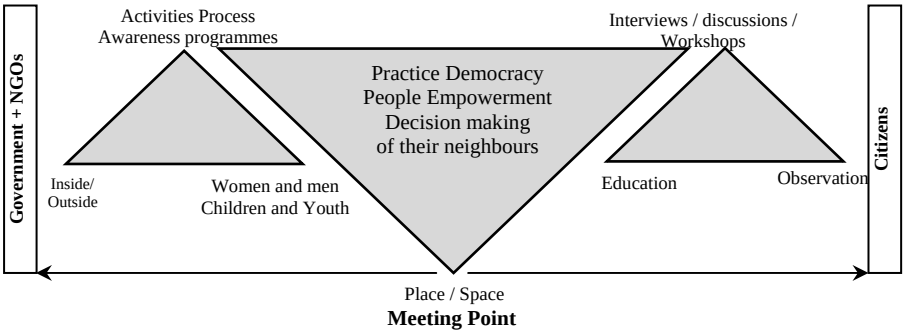

Figure 9. Diagram showing the Multi-disciplinary actors and activities in relation to each other get all together in one space and place - Meeting point

Intelligent Model Phases
The model will go through three phases; each one has main goal to be achieved and conducted by varied activities (Fig. 10).

I. The Pre-Phase – Imperative. Approaching empowering people, awareness programmes about democracy and participation methods, educating people, structuring and holding data base. This phase is to plant the seeds (to establish the first effective step) of change into empowered people in the planning process. As one of the primary elements and activities is initiating the space and place, where people will get together and share democracy. This Phase supposed to be the key and the *fundament* of all coming ones. If it success or work, respectively it will cause the success of the whole PP phases.
Before making people participate in the planning process effectively, linking them with their systems is even more necessary. This link will start with the political factor by discussing with them their roles and duties towards their communities and government.
In such fragmented communities full of problems, a radical phase for the PP practice is essential. Society's structures and backgrounds are important issue to be taken into consideration when public participation

comes to be practiced. Knowing the percentage of youth, women, children and even the family's types, as data base in each case of informal area, is crucial for the process of the public participation.
This phase, in this model, aims in addition at creating a database of information and preparing people for participating by empowering them. Activities conducted in this phase are variable and their outputs have to be varied and non-traditional.

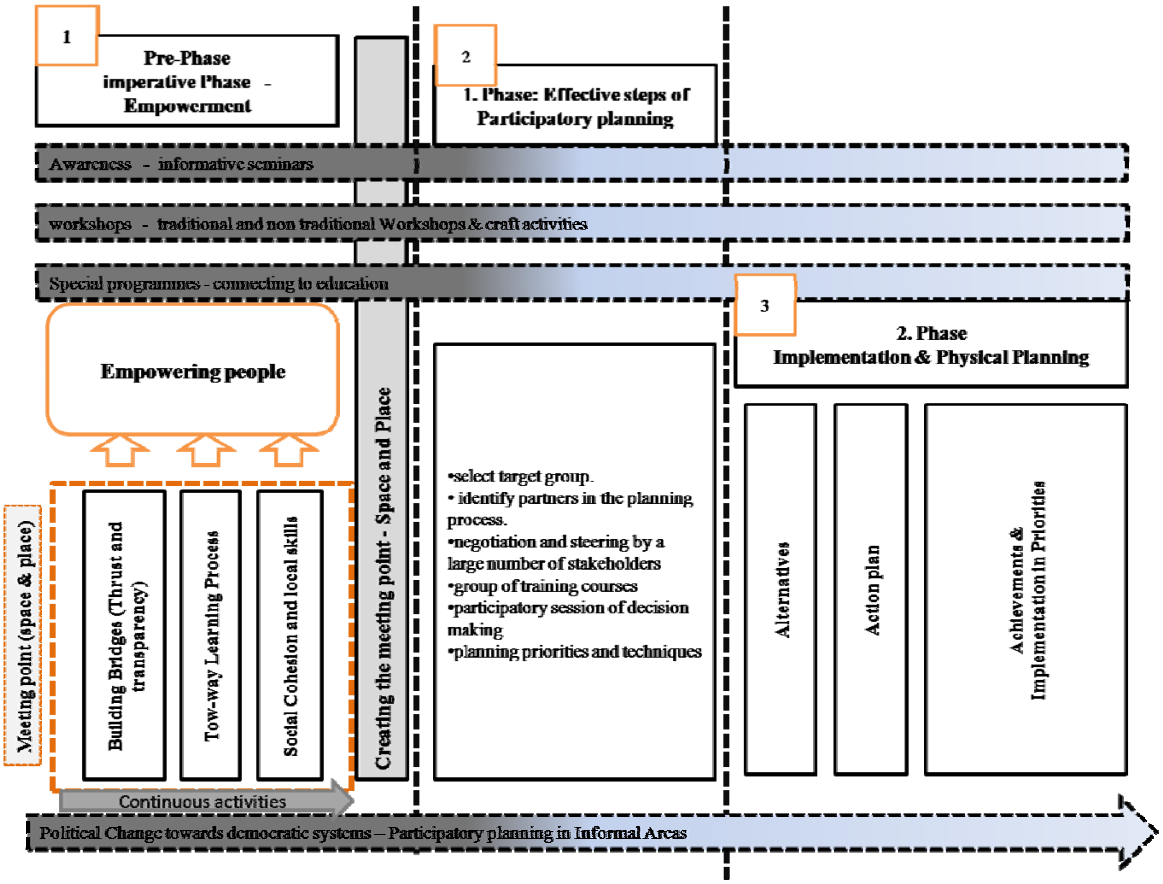

Figure 10. The intelligent model on the three Phases towards empowering people and effective participatory planning process in informal areas

II. The First phase: effective steps of Participation in the planning process. In the previous phase, the model built the required and essential data-base to get into the effective public participation in physical planning. Types of activates and procedures will be tackled on other levels. In this phase, activities focus more on planning and building their communities and letting them participate in the planning process.
Public activities in this phase are to give the chance for negotiation and steering by a large number of stakeholders who act and interact on different levels. The main concern, in this phase, is training courses and participatory session of decision making and planning priorities and techniques. This phase will be run based on the original and theoretical participatory planning methodologies and will need to define the stakeholders' networks and tasks.

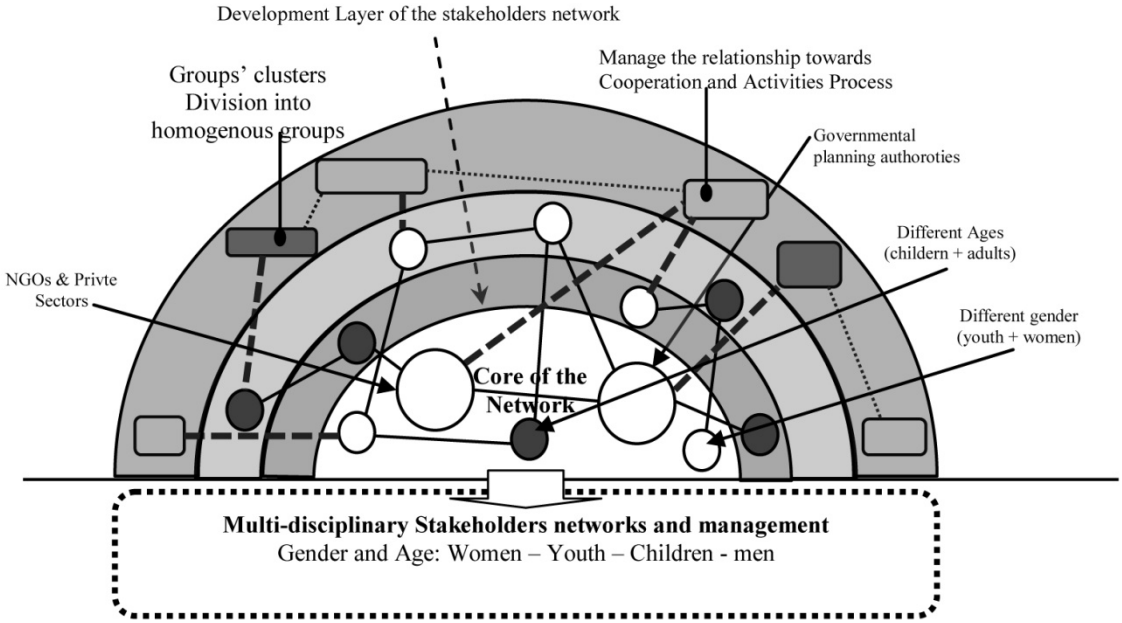

Figure 11. Stakeholders Network and management (GTZ, 2010. Edited by the authors)

III. Define Stakeholders networks. Solid and multi-stakeholder teams play an important role. From the civil society, all local stakeholders representatives; Women, children, youth, men have to play a role in all activities of the PP. A network of stakeholders can be structured after mapping out the social structure and the existing resource of the informal area.
Stakeholders' network must include diverse institutions as local administration, all NGOs in the area, private sectors and community representatives as well as large number of unselected citizens. The stakeholder network has to form a dynamic system of mutual relationships and dependencies. Positions, roles and tasks are clearly diversely defined and minimum estimated depending on the group and promoting partnership and objective cooperation. Inputs from all stakeholders are key factor in achieving a highly significant improvement in the quality of life.

IV. The third phase; implementation and physical planning. Implementation is the last process in this intelligent model of public participation. In it all of what have learned will be implemented. From the interview it was clear that people don't trust the government anymore because they found it working alone, and even with PP it was not a full transparent process. So implementing what you have learned will remove this fears and help in linking them with the community and government as a whole.
Types of activities will different in the last phase by focusing on the training skills and capacity building of workers and people, learn new building techniques and build their place in participation with the planning authorities and experts.

Types of activities – long term and extended programmes
Activates starts in the pre-phase intensively and will continue along the followed phases: Any proposed activities in form of workshops, seminars and information have to be in simple language and with enough materials to enrich the two-way learning process (UNEP, UN-Habitat and ICLEI, 2009).

Tools and mechanisms of how the citizens can contribute with their knowledge, experience and their dreams have to be provided and facilitated. However the activities in the first step will depends more on small and medium sessions, role playing, and interactive workshops. The aim of these activities is to build the bridge between them and the all-around systems.

- *Special Programmes and activities connected to the education systems*: Youth and children, as one of the beneficiaries in these communities, who represent a highest ratio of the population in such informal areas, have to be equitably involved. Each can contribute creatively in the right way and right place within the different activities. Their interventions and roles should not be underestimated. They can contribute within offered activities within the context of their lessons in schools or religious groups.
- *Awareness and informative seminars:* Two-way learning process and learning democracy among the citizens. Awareness programmes and even architecture and planning education for the development towards a sustainable community have to be offered by including all age's categories and all gender groups of citizen. Special informative programmes for youth and women target democracy, team work skills, social cohesion, Information about laws, legislation in planning and housing, and even lessons of how to live and play a role in a sustainable community. Other themes about children upbringing, health, hygienic habits …. etc have to be also considered.
- *Workshops* (traditional and non-traditional Craft activities). Methods of media and publications have to be used along the process as a motivation tool for the already participants and a tool to encourage more of the society members to participate and get in and to capture the private sectors and donors' attention to support the programme.

Concluding Remarks

It is evident that effective PP is only possible when residents fully participate in the planning process or the decision making. A participatory model for the development planning process has to include a wide range of stakeholders and communities. However, each case has its own needs, problems and conditions. Socio-economy and urban structures and infrastructure of informal areas are constants, yet the political systems and the planning institution structures are the variable and changeable factors toward people empowerment and democratic systems.

This *PP intelligent model* is an attempt of *empowering people*, a *two-way learning process* of democracy, and *building transparency and accountability environment between all parties* as a fundament of initiating the *successful*, *effective*, and *sustained* participatory planning mechanisms. The traditional applied PP in informal areas in Egypt had been proved to not lead to sustainable outcome. If people get empowered and the systems become democratic, participatory planning process can be functional.

Residents of informal areas in Egypt are Egyptian' Citizen too, they are part of the whole community and of the power of the state. Losing and marginalising them will cause serious and major social and economic problems. The society is well cohesive from the inside, social cohesion of the whole society is essential to get the balance of planning process. The only solution for that is changing their future by focusing more in building the human first before building the place.

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