

Egyptian Compact-City Veracity: The Fallacy and Credibility of Mixed Use and High Density for a Low Carbon City

1.0 Introduction

Over the past few decades, cities have been seen as a source of environmental degradation and resource depletion (Breheny 1992; M.Jenks, Burton & Williams 1996; Williams, Burton & Jenks 1996). The past ten years have brought different examples of unsustainable cities suffering from environmental degradation, poor built environment and quality of life. To realize low carbon cities, there is a need for clear concepts about how they will look and how they will function (Williams 2000). Yet, this claim has been answered in academia. With reference to a review of existing literature, there is widespread faith in the compact city model's ability to promote urban sustainability (Burton 2000; M.Jenks, Burton & Williams 1996). High densities and mixed uses are the two key concepts, formulating the overall sustainable patterns of cities and creating sustainable urban form (Jones & MacDonald 2004). That is why the recent environmental debate has given a major spur to the question of the contribution that high density and mixed use might make towards lowering energy consumption and pollution levels (Breheny 1992). By contrast, there are also those who argue against the process of increasing densities on the grounds that high density and mixed-use cities lead to traffic congestion and overcrowding, greater local air pollution, more crime, noise, social conflict and neighbour nuisance (Breheny 1992; Chen, Jia & Lau 2008). The Egyptian professionals believe this fallacy and have built their new cities on a very low density.

Looking for the typical Egyptian urban form reveals that the compaction pattern with high density, high diversity of activities and mixed uses is the common form for the majority of Egyptian cities (C.Acioly 2000; Ibrahim 2008). In contrast, new cities have not only been built on a different pattern but also this pattern has no design reference to the Egyptian context (Shalaby 2003). This paper, therefore, questions whether the new strange pattern is more sustainable than the existing one which suffers from different problems. The answer seems to be "yes" (Nippon Koei Co. & International 2006); however, this is not actually true when looking at the future of these cities. The paper assumes that when these new cities have reached their full capacity they would not be low-carbon cities and would also create various social and economic problems. In support, as C. Acioly (2000) explains, the urban form of these cities with low density and separate uses may be the reason for the current of future sustainability problems. The layout of these settlements ignores the traditional planning principles for the desert environment, which have been established in the area over many centuries (Gabr 1990; Shalaby 2003). That is why it is widely agreed that the spatial strategies adopted by the Egyptian government for the new settlements are not socially or economically sustainable (Gabr 1990; Ibrahim 2008) and will not be environmentally sustainable in the near future (El-Zamly 1994). Therefore, the paper extends this discussion by explaining the veracity of the compaction concept on the sustainability of the new Egyptian cities.

2.0 Methodology

As a consequence, in order to answer the main question of this paper, the study firstly needs to examine the coherency of the traditional compact form and, secondly, to define the extent to which the urban form in the new cities has been distorted. Thus, answering these queries may be achieved by using documentation and reviewing the literature. Yet, identifying the sustainability of the current or future urban form in the new Egyptian cities and indicating the

role of compaction on their sustainability are not well covered in academia. Hence, a focus group was conducted, in this study, as a semi-structured discussion by a small group of knowledgeable academic professionals to answer these misunderstanding issues.

Prior to the focus group, a pilot test was designed to assist the researcher to examine the forming of the groups, moderating the session, testing the recording procedure, examining the adequacy of the time and place of the session. Thus, a poll survey was done with the aim of testing the questions and their logical flow and to obtain some preliminary outcomes. This was achieved through sending an invitation email to 50 members who were selected as experts in the research field. The email had a one-page survey questionnaire as an attachment that generally measured their thoughts about the factors affecting the formulation of the new cities as well as their rational opinions towards intensifying these cities.

From those who responded favourably to participating in the focus group, 15 candidates were selected as finalists and the other 35 for the poll survey. Once the final list had been selected, a confirmation letter was emailed to all prospective participants to inform them of the place suggested for the focus group session, the time schedule and the programme. This focus group was designed for a 90-minute discussion, the first 30 minutes for going through the objectives of the focus group and the outcomes from the poll survey. The remainder of the meeting was devoted to participant comments on these findings – agreements or disagreements – and their recommendations for intensifying the new cities.

3.0 Urban sustainability of the traditional Egyptian urban form

It is well known that all the new Egyptian cities have been developed in the western desert where there is a high mean duration of sunshine, minimal rainfall, high level of solar radiation, high temperatures (El-Zamly 1994), water scarcity and deficiency of suitable land for agriculture (GOPP 2006). Bearing in mind that, drawn from literature, the physical elements in arid communities are environmentally, socially and economically crucial (El-Zamly 1999), from an environmental viewpoint, basic urban form in arid zones should provide maximum shade, allow minimum reflection in streets and open spaces and minimize indirect solar radiation to avoid heating the air (Golany 1978). To be a viable paradigm, proper design of the compact-city model should be promoted in these areas to reduce dusty or cold nocturnal wind, solar radiation (El-Wakeel & Serag 1989), energy consumption and in turn gas emissions (Schiller & Evans 2000). Thus, a high density neighbourhood is one essential attribute for these communities (El-Zamly, 1999) in order to “minimize the impact of extreme climate on citizens, maximize proximity of land use and increased shadowed areas” (Golany, 1980, p. 118) and accordingly result in a low carbon city. With the desire to eliminate commuting and the extensive use of vehicles (Golany 1980), another attribute for supporting compaction of the neighbourhood is mixed use. This means the neighbourhood in arid zones has to integrate residential and non-residential uses through applying all different types of essential uses, including shopping, recreational areas and places of work.

Having said this, all of these spatial features are the overall characteristics for the majority of Egyptian cities. The traditional Egyptian city is formed through a particular built structure characterized by narrow streets, high residential use, mixed use and a very dense urban environment (C.Acioly 2000). The high density city has been developed due to a variety of reasons such as immigration to urban centres, concentrations of activities in a very small strip (GOPP 2006), shortage of housing supplies and sometimes the existence of natural barriers (Abdel-Dayem 2004). Hence, in the conventional urban form, plots are almost entirely built over, leaving only a small airshaft, and the common public space is limited to the narrow streets (Becard 1985). Therefore, some argue that for low income areas high density is sensibly important. The street in a low-income district, for example, is central to many activities, including weddings, death observances, playing, socializing and selling various

foods and goods (Ghannam 2002). As a result, people see themselves as willing to sacrifice for the benefit of their neighbours and help the needy and this leads to a sense of community, or in Arabic "*ulfa*" (Ghannam 2002).

Moreover, the mixed-use district is another ordinary attribute for the majority of Egyptian cities (FURP 1984). The spread of commercial uses along circulation spines and among residential uses is a normal aspect for conventional Egyptian cities (Elsadik 1992) and generally takes two main patterns: street shops and commercial zones (Ibrahim 2008). Most obviously, mixed use is a spontaneous response for a series of social arrangements (Bardaa 1992). It is common in traditional districts that the neighbourhood should encourage people to live and feel the satisfaction that comes through gathering people into one place, or in Arabic "*lama*" (Ghannam 2002). This expression means "to gather or collect, or to mix people and hence their requirements and activities" (Ghannam 2002, p.80). Egyptian people often prefer streets, buildings and neighbourhoods that are abundant with life and activities and thus safe, whereas spaces that are not inhabited or used by people are seen as unsafe. Accordingly, people believe that mixed uses support their neighbourhoods in being safe and full of activities, or in Arabic "*wanass*" (Ghannam 2002).

Drawn from the previous discussion, noticeably, traditional Egyptian urban form yields to several variables that affect its formulation and are essentially required to understand these dimensions. At the outset, a harsh urban climate and hot dry climate, has definitely affected the formulation of Egyptian cities through compact urban design (El-Zamly 1999), because it improves the environment of outdoor spaces and reduces the demand for energy (Schiller & Evans 2000), and therefore reduces emissions and pollution (Breheny 1992). Mixed use and high density are called for these regions with the desire to reduce dusty and solar radiation (Golany 1978, 1980) and in turn achieve a low carbon city. Secondly, from a social perspective, Cairenes, principally the low income group, find their satisfaction from the narrow road, mixed-use and dense environment because this brings safety, social interactions and a sense of community (Ghannam 2002). Until now, due to the high concentration of activities, investments and population in a very small strip, the majority of Egyptian cities have been intensified more than once and, in the absence of efficient management, this has led to the widespread problems that Egyptian cities are suffering from. Therefore, cities are seen as very polluting and not sustainable, although, seemingly, these problems are not related to the compact form itself but rather to the spontaneous informal compaction and intensification (C.Acioly 2000). That is why, as many believe, the new-city programme should be based on a dissimilar prototype: very low density and segregation of uses. Consequently, the remainder of this paper goes beyond the process affecting the formulation of the urban form in the new cities and defines how compaction may lead to a low carbon city.

4.0 Planning process and the coherence of urban form

The current settlement strategy in Egypt is relatively new and seemingly borrowed from the UK (Shalaby 2003). While the country was rich with experts in all fields who were "by no means negligible" (Hegab 1985, p. 173), "their knowledge had not yet been integrated in such a manner as to enable them to undertake urban planning" (p. 173). Consulting offices from Western countries, therefore, were invited through the NUCA (New Urban Community Authority) to plan and develop the first generation of new cities in accordance with governmental regulations (Salem 2007; Shalaby 2003). Most obviously, these foreign experiences introduced practical and scientific methods of planning that did not emerge from the underlying traditional processes (Shalaby 2003), and therefore would most likely have negative impacts on developing these cities (Hegab 1985). Therefore, critics questioned whether criteria and standards had been established for the creation of these cities (Becard 1985). Indeed, development criteria and standards had been established that emerged from Law 49 (1979) but there is no indication of the efficiency of these criteria (Hegab 1985). The law is "blind" in not determining the principles of the low and medium-income neighbourhood

or the high-income (Focus Group 2008). Thus, development of the new towns in Egypt was determined as a result of political decisions rather than “rigorous planning” (Rimali 1985,p.175). Conspicuously, the government produced a legislation framework under which the new cities were developed and some of these regulations emerged from existing city problems (Hegab 1985; Focus Group 2008).

Indeed, the new-city programme is a response to several problems facing existing communities such as extreme high densities, high mix of conflicting uses and poor built environment (NUCA 1989). Elsadik (1992) argues that reading about the factors affecting existing urban communities was the guide for the spatial segregation between uses in the new cities. The new-city policy was, therefore, initially based on the spatial separation of uses and principally the segregation between residential uses and administrative or, sometimes, commercial uses (Bardaa 1992), and this led to a greater insight into how planning process affects the formulation of urban form. With this in mind, the non-efficient planning process aimed to escape from the realities and conditions that formed these old cities over the era and produce a new strange pattern without good references. As a result, many argue that this new product is not compatible with local citizen needs (Hegab 1985) or environmental challenges (El-Zamly 1999) and therefore fundamental changes have recently taken place for the new Egyptian cities, particularly those within the Greater Cairo Region (GCR).

Beyond this issue, on the other hand, the urban form is affected not only by non-appropriate planning standards, but also by the transformation of the planning process and the role of developer. The new town programme was originally designated to be carried out and financed by public governmental funds and this led to some ramifications of the planning process (Salem 2007). Public and social subsidy housing districts, infrastructure and public services and transportation facilities were authorized by government (Stewart 1996). Recently, in the late nineteen hundreds, the planning processes witnessed considerable changes in their framework (Salem 2007). Noticeably, Egypt has been pushed into transforming its economy to a free market economy because of huge pressure from outside forces (Bayoumi 2009; El-Batran & Fatah 2009; Stewart 1999). The government sold large portions of un-reclaimed public desert land to real estate developers to finance housing development with the support of major public and private banks(Fahmi & Sutton 2008). Thus, the laissez-faire policy that is aggressively applied nowadays (Bayoumi 2009) is likely to overrun government control as the private companies put forward their design principles (Yousry 2009) and ploy governmental regulations. This conceptualizing is completely obvious for GCR new towns. Most GCR new towns' assets are sold to the private sector, leaving the arena of developing these towns in the hands of private developers (Bayoumi 2009; Stewart 1996; Stewart et al. 2004). The new satellite cities around Greater Cairo, therefore, are now home to a growing number of resorts, golf courses, theme parks and amusement parks that offer tremendous entertainment facilities (Saoud 2002) and this is another reason why the urban form of these cities is seen as different.

As discussed above, the urban form of the new Egyptian cities has been influenced by various dimensions that ultimately produce a very low density pattern (Figure 1). None of these dimensions are aimed at producing a future sustainable community (Focus Group 2008), but rather a modern (Becard 1985), Western (Hegab 1985) and profitable community (Bayoumi 2009). In the early stages, because the Egyptian government was the fundamental developer, the new cities were urbanized under governmental legislation that was created in response to the problems of existing cities and under the influence of Western experiences. The urban form is, therefore, initially characterized by low urban density and non-mixed use. Moreover, recently, since private enterprises have had the upper hand in developing the new cities, a new designing regime has been produced via developing immense luxury housing and gated community prototypes on a different or Western pattern. However, in contrast, some current governmental housing policies may contribute to the intensification of these cities. Recently, since 2005, two big housing projects, National Housing Programme (NHP)

and Priority Care Programme (PCP) are intended to be dissimilar. The two programmes are designed on a rather high density, approximately 250 persons per fedan (NUCA 2009b) while the other earlier programmes are based on a low density, about 120 persons per fedan (Eid 2009).

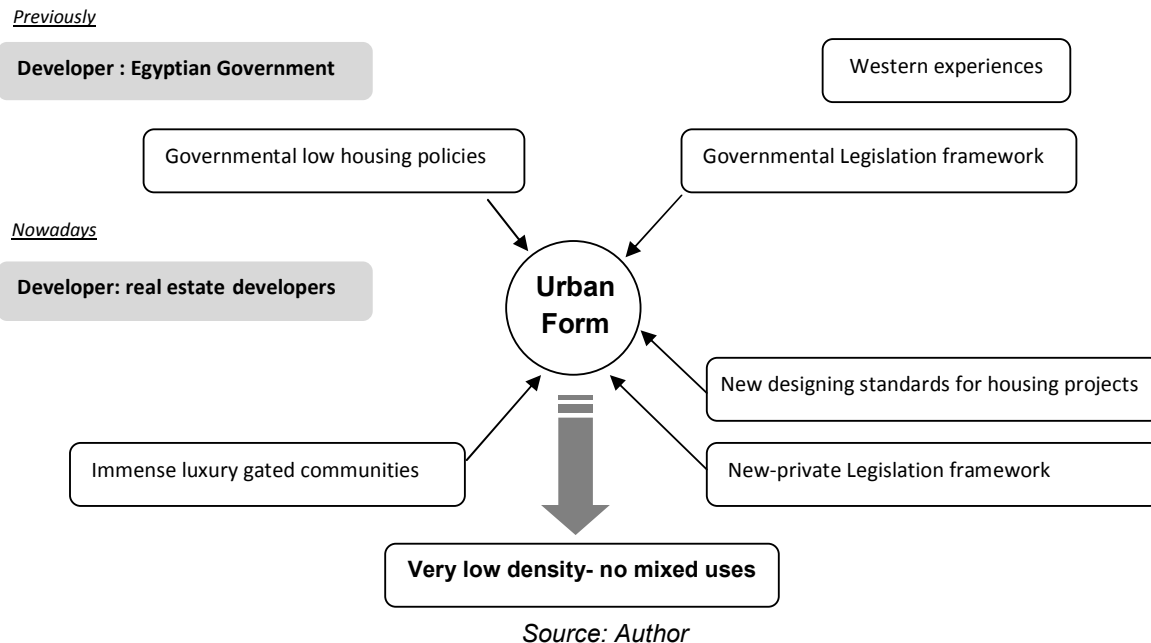


Figure (1) Factors affecting the formulation of the new-city urban form

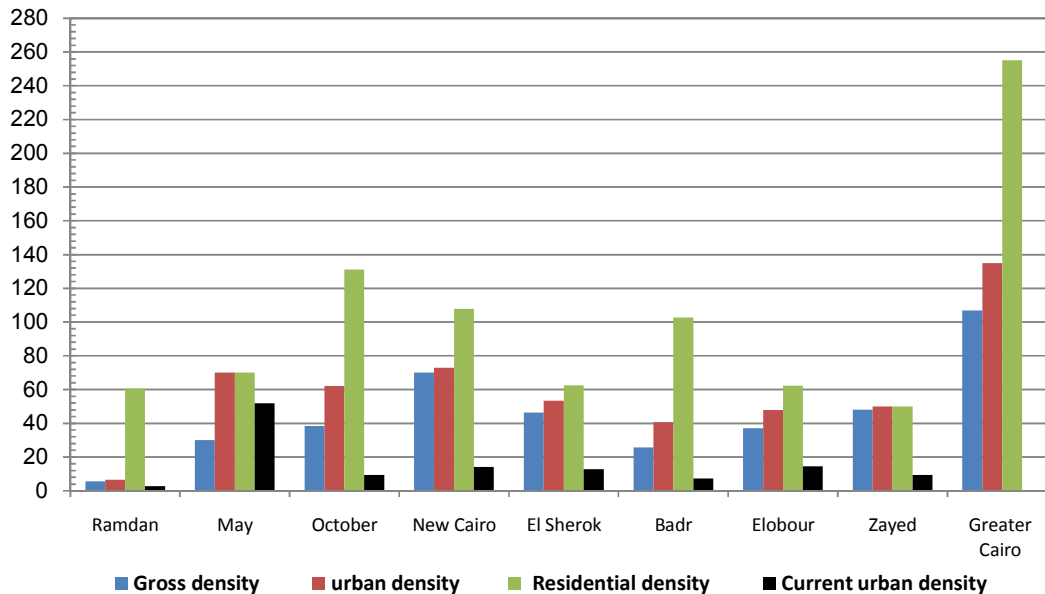
Consequently, it is remarkable that most of these dimensions affecting the urban form lead to a very low density and a non-mixed-use pattern, in strong contrast with the concept of Egyptian cities or the requirements of the desert communities. However, seemingly, there are no longer debates among planning professionals in Egypt on the definition of the high density community and hence whether the current or future urban form of the new towns will be sustainable. Therefore, the next section of this paper examines the soundness of the available evidence for and against the concept of increasing density and mixed use for a highly sustainable city.

5.0 New-city urban form: high or low density?

Longstanding attempts have been made to define high density in the Egyptian context and these are clearly obvious from the outstanding contradictions between the Egyptian experts in defining density in the new-city context. It should be borne in mind that one of the main outcomes of the focus group is that there is no clear-cut agreement, to any extent, among Egyptian professionals on the definition of high density. Of course, this definition depends on the context in which it is used (Haughey 2005) and density also varies considerably from one place to another (Churchman 1999). Hence, tracing the features of the current and ultimate urban form of the new Egyptian cities should be considered.

Since all new cities have not yet completed their development, an analysis of their current urban form only is illogical. That is why this study also uses planned or anticipated density, as a matchless indicator for defining how these cities have been built and developed, rather than their current states, that describe how far these cities have achieved their goals. Due to the shortage of recent data, the study depends on measuring gross, urban and residential densities to describe what the urban form looks like. Yet, residential density is the best

indicator describing the urban form because the other two are affected by many factors such as the city role or function. As seen in figure (2), 10th of Ramadan, for example, is a very low-density city in terms of gross density (3 P/F), however New-Cairo city is a relatively high-density city (NUCA 2008 -a). This is because 10th of Ramadan city is designed as an industry centre and hence large areas are dedicated to non-residential uses, in contrast with the residential New-Cairo city (NUCA 1989). Moreover, regarding the up-to-date states, 15th of May has the highest current urban density (about 52 P/F) but this density does not reflect the real urban form of other cities because they include large areas for non-residential uses.



Source: Based on (Nippon Koei Co. & International 2006; NUCA 1989, 2008 -b)

Figure (2) Gross, urban and residential densities for the GCR's new cities

A critical comparison between the new cities in the GCR and the average for Greater Cairo may present the different form between the existing and new cities and also answer the question of which density may describe the new city. While the real density of Greater Cairo is bigger than the numbers shown in figure (2), the density in the GCR is much bigger than in all new cities. For example 6th October city, the highest residential density, is approximately half the Greater Cairo average. Moreover, considering the residential density of Cairo districts that are similar to the new cities, their density varies between 250 and 350 persons per fedan (Nippon Koei Co. & International 2006), and this, of course, is far from the target density of most of the new cities. Therefore, these facts point out how differently the new cities have been developed – in other words, low density is a general feature of these cities.

6.0 New Egyptian settlement: Low or high carbon city

While recent studies reveal the existence of much environmental potential for the new Egyptian cities (Nippon Koei Co. & International 2006), there is ongoing evidence that supports the fallacy of this belief. A general assessment of the new Egyptian cities, especially those around Greater Cairo, indicates the extent to which the urban form makes them unsustainable (Ibrahim 2008). Seemingly, some parts of these cities are seen as environmentally or socially sustainable, notably the new gated communities. This is supported by the argument that, most of these communities offer similar promises such as “healthy environment, comfort, convenience, various community services, peace and quiet” (Kuppinger & College 2004, p. 46) and “a prestigious suburban lifestyle attained by

common features such as a lush manicured landscape, architecture character, security, and distinctive amenities and service facilities” (Yousry 2009, p. 3). However, the city as a whole will still be less sustainable and could be seen as a high carbon city in the future (C.Acioly 2000), which may be for many reasons.

Many describe the new towns according to a modern European (Becard 1985) or globalized (Kuppinger & College 2004) model. This European or modern model has emerged from Western countries that have a different environmental and social context. For example, the pace of the upsurge of these luxury gated communities (Bayoumi 2009) produces other new patterns that are not likely to be found in the rest of the Egyptian cities. Golf courses, luxury residential compounds, gated communities or villas (Bayoumi 2009) boasting vast green areas, swimming pools, mini zoos and kids’ corners (Saoud 2002) are normal physical features of the gated communities. Therefore, the new communities around Greater Cairo that have witnessed “an unprecedented boom in new desert development schemes of gated luxury communities” (Becard 1985, p. 46) are evidently not the traditional model, and perhaps not sustainable. This is because of the negative effects on the environment, and the huge waste of scarce water supplies (Hammond 1999). So, in case of developing and operating these communities in the light of immense and exclusive greenery, luxury roads and spaces and very large development areas, regardless of the environmental concerns that have been recommended for arid regions (Kuppinger and College 2004), will definitely result in many environmental problems. The extensive use of air conditioning is an expected feature of this built environment since the planning principles have not considered the climate requirements. Therefore, it is predictable that these cities in the future will undergo a high increase in energy consumption that will contribute to the greenhouse effects on a global scale (Schiller & Evans 2000).

Moreover, with regard to commuting, most of the GCR new towns have been replanned and have developed their extensions for high income luxury residences at the expense of those devoted to the poor (Bayoumi 2009; Yousry 2009). The design and social vision of these gated communities promise an escape from the pollution, crowding and noise of Cairo city (Kuppinger and College 2004), which is why elites look for these communities, escaping from the city crowd to peaceful weekend retreats (Saoud 2002). Most of these communities are considered weekend communities that have a high dependency on the capital providing services, employment and sometimes recreation, consequently affecting the sustainability of the new cities. The expansion of the gated communities has established physical exclusion (Landman 2000), because such communities “physically separate a specific area from its environment and create zones or pockets of restricted access within the urban fabric. Accordingly, given the proliferations of these sprouting luxury land uses, the city becomes structured by separate islands with very low density. Of course, some of these communities may succeed in attracting residents but they are still ‘a city within a city’” (Yousry 2009, p. 11) which definitely creates shorter commuting on the local scale but also leads to “Longer commuter journeys and congestion” (Landman 2000,p. 5) on the city scale. Thus, huge daily and weekly trips are generated between these communities and Greater Cairo, and also within the new city itself, especially when each household owns more than one car. For example, in 6th October city, which includes a high number of gated communities, car ownership is relatively high (about 130 per 1000 capita), while in other cities such as 15th May it does not exceed 42 per 1000 capita (Shourbagy 2009). The problem, therefore, has become more complicated since it is coupled with the high rate of car ownership.

7.0 Compaction for the new Egyptian cities – does it matter?

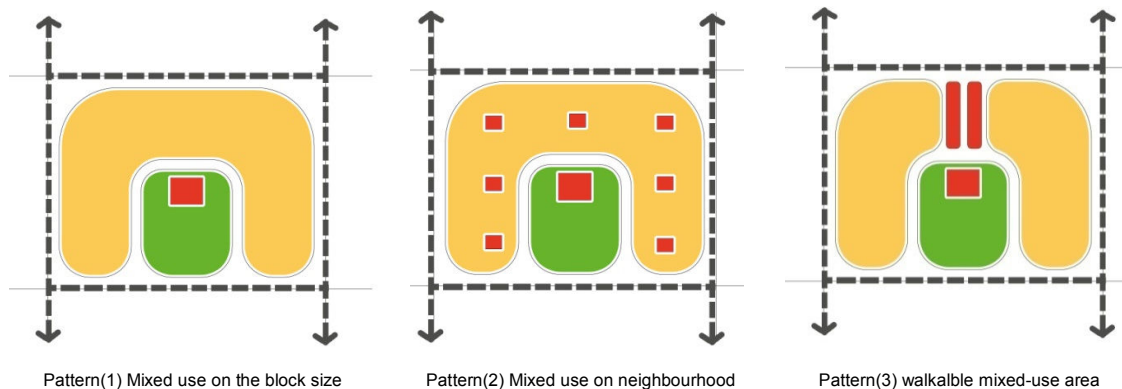
According to the literature, compaction has happened in the new cities through two main processes: infill development by infill mixed use or infill housing and a new development in the outskirts. Whereas recent statistics are scarce, new cities in the GCR have some obvious

examples of infill mixed uses (Bardaa 1992; Elsadiq 1992) and other patterns of intensification through new development; however, apparently, all of these examples are still under planning or even not popularized (Focus Group 2008). As seen from table (1) 6th October, 10th Ramadan and 15th May cities have patterns of infill mixed-use neighbourhoods and some high density cases. This is because these cities were developed in the initial generation and lately their local needs have directed the development towards intensifying the local environment through mixed-use development (Bardaa 1992). In a sense, mixed use could be observed in most of the new cities through one pattern: mixed use on the block size (Figure 3). This pattern is in common use and allocates retail outlets and daily shops in one building that segregates it somewhat from other residential uses (Bardaa 1992). However, along with the features of mixed use in the Egyptian cities, this pattern is not an apparent mixed-use model. The poor level of purchasing for certain types of shops and commodities,, the long distances between housing and services in the light of a non-compactable public transportation system are reasons for creating new unplanned patterns of mixed use (Focus Group 2008). The new pattern is achieved by the distribution of commercial uses on scattered sites within the neighbourhood (Focus Group 2008) and in this case the density and diversity of uses is much denser. This pattern occurs randomly due to local needs but is under the control of the local authority (Bardaa 1992) and therefore it usually conforms to the vertical mixed-use prototype “living above shops”. Furthermore, a walkable mixed-use area or street is another pattern that is recently found in the new-city centre and some gated communities (Yousry 2009) such as those located on El-Fayoum Area in the south-east of October city (NUCA 2008). This can be seen from the new resettlement plan of October city (2008) which suggests walkable mixed-use areas, nearly 507 fedan (NUCA 2008), in the southern outskirts development.

Table (1) Previous and ultimate intensification processes for the GCR new towns

City Location	New Cities	Intensification Process					
		Infill development				New outskirts development	
		Mixed use		Housing density		Real	Plan
Real (1)	Plan(2)	Real (3)	Plan(2)				
New Cities in GCR	10 th Ramadan						
	6 th October						
	15 th May						
	El-Obour						
	El-Sherouk						
	New Cairo						
	El-Sheikh Zaied						
	Badr						

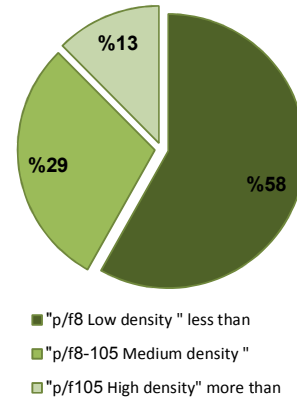
Source : (1) (NUCA 2009c), (2)(NUCA 2008, 2008 -a), (3)(NUCA 2009a)



Source: Author
Figure (3) Mixed-use patterns in new cities

While obviously intensification should be enhanced in the new cities, this dogma still faces a debate among Egyptian experts, as is clear from reviewing the latest plans of the new cities. Of course, noticeably, a number of intensification processes may be observed in the recent spatial plans for some cities such as October city and New Cairo city that are planned as new metropolises. However, seemingly, these two cities have replanned on a low residential density.

For example, according to the latest planning report, the gross and residential density of October city is very low, nearly 14.7 and 53 p/fedan respectively (NUCA 2008). This is a result of the assignment of large areas for low and very low density. This is also a result of defining the high density, in this recent plan, on a very low scale since high density is considered more than 105 p/fedan (NUCA 2008). As shown in figure (4), the total area for low residential density, "less than 8 p/fedan", is about 38,162 fedan which is approximately recorded as 58.1% of the total housing area, whereas only 13% is considered for the high density area. Therefore, all the new cities are considered low density cities.

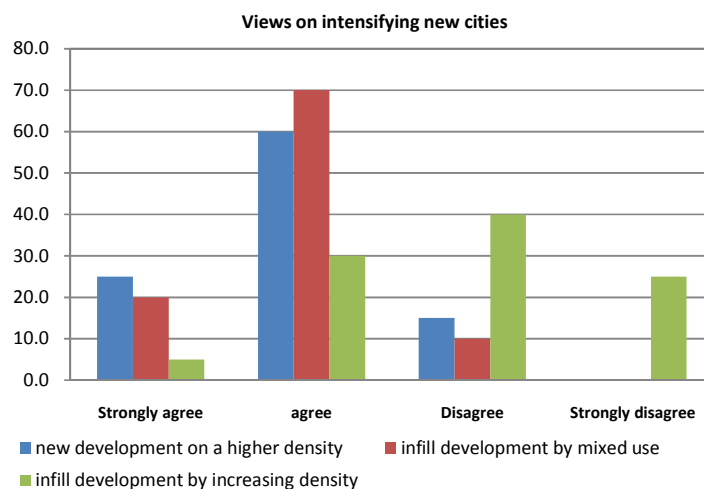


Source: (NUCA 2008)

Figure (4) Proportion of density share in the re-settlement plan

Accordingly, the focus group concluded that there are two burning contradictions in the context of intensifying the new cities. The majority support intensification in terms of a better social environment and economic viability but there are a few against this dogma. The poll survey simply asked professionals on their views towards intensifying new cities through three processes: infill development by mixed use, infill development by increasing density and outskirts development on a higher density.

The overall pattern of the qualified visions supports the broad concept of intensifying the new cities, figure (5). Most of these opinions support intensification by mixed-use development (90% of the total response) and building the new development on a higher density (85% of the total response). However, a small proportion holds with the third process, identification through increasing the density of the built-up areas (35% of the total response).



Source: Author

Figure (5) Different views on intensifying new cities

Both arguments have their logical reasons and ideologies and this, of course, reveals the need for measuring the sustainability through further research by asking local residents. The focus group concluded that enhancing the urban growth of these cities, saving money, increasing the social interaction and facing the future challenges are the main reasons of those who support intensification.

8.0 Conclusion

This paper examines the widespread claims that high density and mixed use are better for a more sustainable and a low carbon city. It is hypothesized here that the current urban form in the new Egyptian cities would make them less sustainable in terms of environmental and social aspects. In order to test this claim, a review of some present facts and features and a comparison with the theoretical principles present a rational explanation of the sustainability of these cities. A focus group was also conducted with the Egyptian professionals to provide a general assessment of the current pattern in the new Egyptian cities and define the process that could enhance their sustainability.

As this paper shows, the new town policy in Egypt has many challenges (Stewart 1996), one of which is the unsuitable urban form because of which these cities are considered bedroom or ghost cities. The non-efficient development standards produced for these cities and alteration of the planning process affect the coherence of the urban form. Obviously, neither the physical nor the social or environmental principles have been recognized in building these cities (Focus Group 2008). Therefore, social and spatial exclusions, high commuting, high energy consumption in terms of air conditioning, traffic congestion on the regional road linking with Cairo, and exclusive greenery in the light of water scarcity, are existing and anticipated problems that will certainly lead to a non-sustainable city.

That is why most Egyptian professionals support intensification of the new cities. Of course, all of these cities have been developed on a very low density and a non-mixed-use pattern; however, there have been a few, modest, attempts towards increasing density. But intensification is usually seen negatively in the Egyptian context. This is because most of the earlier intensification cases were not good due to lack of efficient management and control. Therefore, nearly all the professionals agree with infill mixed use or with building the new development with higher density. Mixed-use intensification can be controlled by allocating when and where the mixed use should take place. The second pattern is a sort of new development but on a higher level of density and mixed use that may ultimately cause the intensification of the city as a whole, as this type is easy to control and supervise. Yet, infill housing intensification in the neighbourhood is seemingly unacceptable, as these areas have been developed on fixed infrastructure and services that are difficult to change.

Finally, for the new development, this involved setting out a list of reasonable standards which emerged from the coherency of the traditional form. These standards should be considered the flexibility of the urban form (Focus Group 2008; Becard 1985) and support compaction, particularly in the local levels (Becard 1985). Building the new development should be done on a high density and mixed-use concept and through infill mixed use for the existing development. Yet more research and tests are required to define the outcomes of increasing conventional density on the quality of life or the quality of the built environment in order to minimize the negative impacts and promote the full potential through a compatible management.

9.0 References

- Abdel-Dayem, G.E. (2004) *Towards a New Model for Defining the Dimensions Affecting Densities in Urban Centers : Greater Cairo as a Case Study* Cairo University, Cairo-Egypt.
- Bardaa, A. (1992) Distribution Types of Commercial uses in the New Cities *New Cities Evaluations* Faculty of urban and Regional Planning Cairo.
- Bayoumi, W.N.A. (2009) The Tale of the Unsettled New Cairo City-Egypt: A Review for the Implications of the Adopted Privatization and Laissez- Fair Policies on Excluding the Poor from its Housing Market, *Young Academics Network* Vienna.
- Becard, L. (1985) New Settlements: A New Approach to Solving Existing Housing and Urban Problems, *The Expanding Metropolis:Coping with the Urban Growth of Cairo*, ed. A. Amin, Concept Media, Singapore.
- Breheny, M. (1992) The contradictions of the compact city, in M. Breheny (ed.), *Sustainable development and urban form*, Pion Limited, London.
- Burton, E. (2000) 'The Compact City: Just or Just Compact? A preliminary analysis', *Urban Studies*, vol. 37, no. 11, pp. 1969–2001.
- C.Acioly, C. (2000) Can Urban Management Deliver the Sustainable City? Guided Densification in Brazil Versus Informal Compactness in Egypt, in J. M. & B. R. (eds), *Compact city : Sustainable urban forms for developing countries*, E&FN Spon, London.
- Chen, H., Jia, B. & Lau, S.S.Y. (2008) 'Sustainable urban form for Chinese compact cities: Challenges of a rapid urbanized economy', *Habitat International*, vol. 32, no. 1, pp. 28-40.
- Churchman, A. (1999) 'Disentangling the Concept of Density', *Journal of Planning Literature*, vol. 13, no. 4, pp. 389-411.
- Eid, M.S. (2009) *Housing Programs and Projects for Low-Income Groups in New Egyptian Cities , an Assessment for El-Mostakbal and El-Shabab Housing Programs*, Cairo University, Egypt.
- El-Batran, M. & Fatah, M.A. (2009) Further Development of New Urban Communities in Egypt: A Future Outlook, *International Conference on Developing the New Urban Communities Policies and Priorities*, Alexandria-Egypt.
- El-Wakeel, S. & Serag, M. (1989) *Climate and Arid Zones Architecture (in Arabic)*, Alam Elkotob, Egypt.
- El-Zamly, H.A. (1994) *Arid Zones: A New Trend in Planning Education*, Cairo University Cairo-Egypt.
- El-Zamly, H.A. (1999) Arid Zones: A New Trend in Planning Education, *2nd International Symposium, Planning Education in the 21st Century: Past Experiences and Future Responses* Faculty of Urban and Regional Planning- Cairo University Cairo-Egypt.
- Elsadik, M.T. (1992) Land Use Structure in New Cities between Theoretical Concept and Executive Reality (in Arabic) *New Cities Evaluations* vol. 2, Faculty of urban and Regional Planning Cairo.
- Fahmi, W. & Sutton, K. (2008) 'Greater Cairo's housing crisis: Contested spaces from inner city areas to new communities', *Cities*, no. 25, pp. 277–297.
- FURP (1984) *The Wide Features of the Egyptian Cities (in Arabic)*, Research and Technology Academy Cairo-Egypt
- Gabr, A. (1990) *A Landscape Brief for Egyptian Desert New Town*, The British Library, Document Supply Centre.
- Ghannam, F. (2002) *Remaking the Modern Space, Relocation, and the Politics of Identity in a Global Cairo*, University of California Press, Berkeley.

- Golany, G. (1978) *Urban Planning for Arid Zones; American Experiences and Directions* John Wiley & Sons, New York.
- Golany, G. (ed.) (1980) *Subterranean Settlements for Arid Zones* The Architectural Press. London, New York.
- GOPP (2006) *Development Strategy for Egyptian Governorates (in Arabic)*, vol. 3, General Organization of Physical Planning, Ministry of Housing, Utilities and New communities Cairo-Egypt.
- Hammond, A (1999) The Buzz of the Desert. Cairo Times, 1.–14.4.1999
- Haughey, R.M. (2005) Higher-Density Development: Myth and fact, Urban Land Institute (ULT), Washington
- Hegab, M.S.E. (1985) New Towns Policy, *The Expanding Metropolis:Coping with the Urban Growth of Cairo*, ed. A. Amin, Concept Media, Singapore.
- Ibrahim, A.A. (2008) Using of compact urban-form for the sustainability of the new settlements in developing countries, *48th Congress of the European Regional Science Association*, Liverpool.
- Jones, C. & MacDonald, C. (2004) Sustainable Urban Form and Real Estate Markets, *the annual European Real Estate Conference*, Millan, 2-5 June.
- Kuppinger, P. & College, M. (2004) 'Exclusive Greenery: new gated communities in Cairo', *City & Society*, vol. 16, no. 2, pp. 35–62.
- Landman, K. (2000) Gated communities and urban sustainability: taking a closer look at the future, *2nd Southern African Conference on Sustainable Development in the Built Environment*, Pretoria, South Africa.
- M.Jenks, Burton, E. & Williams, K. (1996) Achieving the compact city through intensification: an acceptable option?, in M.Jenks, E. Burton & K. Williams (eds), *The Compact City, a Sustainable Urban Form*, E & FN Spon, London.
- Nippon Koei Co., L. & International, K.E. (2006) *The Master Strategic Plan of 6th of October and El-Sheikh Zayed New cities Jointly in One Unit* Cairo
- NUCA (1989) *New Cities : Shining Remarks on Egyptian Map (in Arabic)*, New Urban Communities Authority, Cairo-Egypt.
- NUCA (2008) *The Strategic planning of 6th October and El-Sheikh Zayed as One Planning Unit*, vol. 2, New Urban Communities Authority, Cairo-Egypt.
- NUCA (2008 -a) *The Strategic planning of the New Cairo*, vol. 1, New Urban Communities Authority, Cairo-Egypt.
- NUCA (2008 -b) *Summary Reports for the Achievement of New Cities* New Urban Communities Authority, Cairo-Egypt.
- NUCA (2009a) *Density in October New City " in Arabic"*, Project Data Center, no February 2009, New Urban Communities Authority, Cairo-Egypt.
- NUCA (2009b) *Housing Projects* [Online], New Urban Communities Authority, Available from: (Accessed: March).
- NUCA (2009c) *Land Use Map*, no February 2009, New Urban Communities Authority, Cairo-Egypt.
- Rimali (1985) " New Towns Policy" in Hegab paper, *The Expanding Metropolis:Coping with the Urban Growth of Cairo*, ed. A. Amin, Concept Media, Singapore.
- Salem, R.G. (2007) *The Development of Planning Processes in Egypt* Cairo University, Egypt.
- Saoud, R. (2002) *Introducation to the Islamic City* Foundation for Science Technology and Civilization Manchester
- Schiller, S.d. & Evans, J.M. (2000) Urban Climate and Compact Cities in Developing Countries, in M.Jenks & R.Burgess (eds), *Compact city : Sustainable urban forms for developing countries*, E&FN Spon, London.

- Shalaby, A.-F.S. (2003) *Transfer of Ideas through Planning Education in Egypt : The Case of the Spatial Form of Low Income Housing* Cardiff University, Cardiff.
- Shourbagy, M. (2009) The evaluation of road and transportation network in the new settlements *International Conference on Developing the New Urban Communities Policies and Priorities*, Bibliotheca Alexandrina -EGYPT.
- Stewart, D.J. (1996) 'Cities in the Desert; the Egyptian New- Town Program', *Annals of the Association of American Geographers*, vol. 86, no. 3, pp. 459-422.
- Stewart, D.J. (1999) 'Changing Cairo: the Political Economy of Urban Form', *International Journal of Urban and Urban and Regional Research*, vol. 23, pp. 128- 146.
- Stewart, D.J., Yin, Z.-Y., Bullard, S.M. & T.MacLachlan, J. (2004) 'Assessing the Spatial Structure of Urban and Population Growth in the Greater Cairo Area, Egypt: A GIS and Imagery Analysis Approach', *Urban Studies*, vol. 41, no. 1, pp. 95–116.
- Williams, K. (2000) Does intensifying cities make them more sustainable?, in K. Williams, E. Burton & M. Jenks (eds), *Achieving Sustainable Urban Form*, E & NSpon, London, pp. 30-45.
- Williams, K., Burton, E. & Jenks, M. (1996) Achieving the compact city through intensification: An acceptable option, in K. Williams, E. Burton & M. Jenks (eds), *The Compact City: A Sustainable Urban Form?*, E & NSpon, London, pp. 83-96.
- Yousry, A.M. (2009) The Privatization of Urban Development in Cairo: Lessons Learned from the Development Experience of Al Rehab Gated Community *International Conference on Developing the New Urban Communities Policies and Priorities*, Alexandria-Egypt.

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