

DESERTED CITIES

Mobilizing "Informality" to Greater Cairo's Deserted Cities

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DESERTED CITIES

Mobilisierung der "Informalität" in den verlassenen
Großstädten von Kairo

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In a poignant tribute, I dedicate this PhD to my grandfather, Adel Abdelhakim, who departed just four months before my dissertation presentation. His legacy of resilience and commitment to education continues to inspire and guide me in my academic pursuits.

In essence, this thesis is not just a culmination of research but a reflection of collective support and encouragement from these individuals. Their influence has left an indelible mark on my academic and personal growth.

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ABSTRACT

UNDERSTANDING THE RESEARCH TOPIC

Rapid population growth and shortage of housing in Cairo have created a challenging scenario for Greater Cairo, exacerbated by the existence of tens of thousands of vacant dwellings in the desert cities surrounding Cairo. That has led to a significant difficult economic situation, contributing to an ecological disaster marked by unsustainable energy and material wastage. Simultaneously, there is a surge in intensive construction activities within informal settlements in Cairo, often erected on fertile agricultural land in the Nile Valley without adequate infrastructure. Despite the longstanding presence of this issue, the State has failed to address it, opting to deny its existence. Unsuccessful strategies, such as planning desert cities from scratch and building new satellite towns continue.

While previous research, including notable contributions from David Sims, has extensively analyzed the problems surrounding deserted cities, these studies primarily focus on the analysis of issues and the actors of the process without delving into the broader context or presenting solutions to urbanize the existing urban and architectural environments in the deserted cities.

The current research surpasses the mere analysis of contextual factors influencing the planning of desert cities. It meticulously examines the political, social, and economic conditions underpinning the conception and realization of these cities, elucidating the problematic situation. However, the objective is not to construct a socio-scientific or political-economic theory explaining the origins of planning concepts or to develop an "actor model" detailing the motives and interests of institutions, firms, and individuals involved. Instead, this research aims to shift the focus towards identifying actionable concepts for the enhancement and further development of deficient settlement structures, ranging from urban planning levels to architectural typologies.

Research information and data:

Relevant specialist publications concerning the political-economic dimensions were collected, particularly the spatial development of Egypt, with a specific focus on the planning concepts of desert cities, particularly in the Greater Cairo region.

Utilizing statistics from various sources such as the GOPP, governorates, ministries, and the World Bank, along with government maps, images, and Google Earth, the research has established a data foundation. An essential component of this foundation comprises my surveys, encompassing urban inventories through walk-throughs, photographic documentation, and interviews with key individuals.

Planning concepts:

The spatial planning concepts expounded in chapters 6-8 are built upon preceding studies. Suggestions for integrating the informal activities with the existing deserted cities are a product of the author's extensive involvement with informal Cairo and the deserted cities surrounding Cairo, notably during the bachelor project at the GUC/ University of Stuttgart (Mostafa Aboughaly, under the supervision of Prof. Dr. Helmut Bott, 2014) and the Master's thesis at the AA Architecture School in London (M.Arch Mostafa Aboughaly, under the supervision of Prof. Jorge Fiori, 2017).

Proposed strategies for the "urbanization" of desert cities result from research and years of engagement with the subject. However, they remain hypotheses requiring empirical testing before broad implementation. Unfortunately, unlike scientific research, urban studies lack controlled laboratory settings. The concept of "real laboratories" has been discussed and applied in projects, such as the BW State program on real labs and urban projects by the SI institute in the University of Stuttgart.

A well-established research and development practice in Germany, exemplified by the "ExWoSt Programme," offers extensive experience in architecture and urban development. This program, managed by the BBSR (Federal Institute for Building, Urban Affairs, and Spatial Research), focuses on Experimental Housing and Urban Development.

To advance this methodology in the context of Cairo's Deserted cities, the results of the present work could be extended through:

1. Implementing proposed strategies and planning concepts in 2-3 experimental interventions.
2. Initiation is supported by government incentives and subsidies.
3. Research support from Egyptian and international expert teams, overseen by the GOPP.
4. Evaluation of results over 3, 5, and 10 years, led by the GOPP.
5. Correction and refinement of proposed planning strategies and design concepts.
6. Development of a comprehensive program for the urbanization of existing desert cities.
7. Revision of existing strategies and concepts for the decentralization of Egyptian settlement development.

ZUSAMMENFASSUNG FORSCHUNGSTHEMA

Das rasche Bevölkerungswachstum und die Wohnungsknappheit in Kairo haben ein schwieriges Szenario für den Großraum Kairo geschaffen, das durch die Existenz zehntausender leerstehender Wohnungen in den Wüstenstädten um Kairo noch verschärft wird. Dies hat zu einer äußerst schwierigen wirtschaftlichen Situation geführt und zu einer ökologischen Katastrophe beigetragen, die durch eine unhaltbare Energie- und Materialverschwendung gekennzeichnet ist. Gleichzeitig nimmt die intensive Bautätigkeit in den informellen Siedlungen in Kairo zu, die oft auf fruchtbarem Ackerland im Niltal ohne angemessene Infrastruktur errichtet werden. Obwohl dieses Problem schon seit langem besteht, hat es der Staat versäumt, es anzugehen, und sich dafür entschieden, seine Existenz zu leugnen. Erfolgreiche Strategien, wie die Neuplanung von Wüstenstädten und der Bau neuer Satellitenstädte, werden fortgesetzt.

Während frühere Forschungsarbeiten, darunter bemerkenswerte Beiträge von David Sims, die Probleme im Zusammenhang mit Wüstenstädten umfassend analysiert haben, konzentrieren sich diese Studien in erster Linie auf die Analyse der Probleme und der Akteure der Prozesse, ohne sich mit dem breiteren Kontext zu befassen oder Lösungen für die Urbanisierung des bestehenden städtischen und architektonischen Umfelds in den Wüstenstädten vorzustellen.

Die vorliegende Untersuchung geht über die bloße Analyse der kontextuellen Faktoren, die die Planung von Wüstenstädten beeinflussen, hinaus. Sie untersucht akribisch die politischen, sozialen und wirtschaftlichen Bedingungen, die der Konzeption und Realisierung dieser Städte zugrunde liegen, und beleuchtet die problematische Situation. Ziel ist es jedoch nicht, eine sozialwissenschaftliche oder politisch-ökonomische Theorie zu konstruieren, die die Entstehung von Planungskonzepten erklärt, oder ein "Akteursmodell" zu entwickeln, das die Motive und Interessen der beteiligten Institutionen, Firmen und Personen beschreibt. Vielmehr geht es darum, handlungsfähige Konzepte zur Aufwertung und Weiterentwicklung defizitärer Siedlungsstrukturen zu identifizieren, die von der städtebaulichen Ebene bis hin zu architektonischen Typologien reichen.

Recherchierte Informationen und Daten:

Es wurden einschlägige Fachpublikationen zu den politisch-ökonomischen Dimensionen gesammelt. Dies fokussiert sich insbesondere auf die räumliche Entwicklung Ägyptens, mit besonderem Augenmerk auf die Planungskonzepte von Wüstenstädten, vor allem im Großraum Kairo.

Mit Hilfe von Statistiken aus verschiedenen Quellen wie dem GOPP, Gouvernements, Ministerien und der Weltbank sowie staatlichen Karten, Bildern und Google Earth wurde eine Datengrundlage geschaffen. Ein wesentlicher Bestandteil dieser Grundlage sind meine Erhebungen, die städtische Bestandsaufnahmen durch Begehungen, Fotodokumentation und Interviews mit Schlüsselpersonen umfassen.

Planungskonzepte:

Die in den Kapiteln 6-8 dargelegten Raumplanungskonzepte bauen auf den vorangegangenen Studien auf. Vorschläge zur Integration der informellen Aktivitäten in die bestehenden Wüstenstädte sind das Ergebnis der intensiven Beschäftigung des Autors mit dem informellen Kairo und den Wüstenstädten um Kairo. Insbesondere während des Bachelorprojekts an der GUC/Universität Stuttgart (Mostafa Aboughaly, unter der Betreuung von Prof. Dr. Helmut Bott, 2014) und der Masterarbeit an der AA Architecture School in London (M.Arch Mostafa Aboughaly, unter der Betreuung von Prof. Jorge Fiori, 2017) wurden die Grundlagen hierfür bereitet.

Die vorgeschlagenen Strategien für die "Urbanisierung" von Wüstenstädten sind das Ergebnis von Forschung und jahrelanger Beschäftigung mit diesem Thema. Sie bleiben jedoch Hypothesen, die vor einer breiten Umsetzung empirisch überprüft werden müssen. Anders als in der wissenschaftlichen Forschung gibt es in urbanen Studien leider keine kontrollierten Laborbedingungen. Das Konzept der "Reallabore" wurde diskutiert und in Projekten wie dem Landesprogramm BW zu Reallaboren und Stadtprojekten des SI-Instituts der Universität Stuttgart angewandt.

Eine gut etablierte Forschungs- und Entwicklungspraxis in Deutschland, die durch das "ExWoSt-Programm" veranschaulicht wird, bietet umfangreiche Erfahrungen im Bereich Architektur und Stadtentwicklung. Dieses Programm, das vom Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR) geleitet wird, konzentriert sich auf den experimentellen Wohnungs- und Städtebau.

Um diese Methodik im Kontext der Wüstenstädte von Kairo weiterzuentwickeln, könnten die Ergebnisse der vorliegenden Arbeit durch folgende Maßnahmen erweitert werden:

1. Die Umsetzung der vorgeschlagenen Strategien und Planungskonzepte in 2-3 experimentellen Interventionen.
2. Die Initiierung wird durch staatliche Anreize und Subventionen unterstützt.
3. Forschungsunterstützung durch ägyptische und internationale Expertenteams unter der Leitung des GOPP.
4. Die Auswertung der Ergebnisse über 3, 5 und 10 Jahre unter der Leitung der GOPP
5. Die Korrektur und Verfeinerung der vorgeschlagenen Planungsstrategien und Designkonzepte.
6. Die Entwicklung eines umfassenden Programms zur Urbanisierung der bestehenden Wüstenstädte.
7. Die Überarbeitung der bestehenden Strategien und Konzepte zur Dezentralisierung der ägyptischen Siedlungsentwicklung.

INTRODUCTION

1. GLOBAL POPULATION GROWTH AND URBANIZATION

As health improved and mortality decreased, the world's population changed dramatically. Especially in the twentieth century, the world's population has quadrupled in the last 100 years. As seen in the chart, world population growth has been exponential and is now the steepest growth on the curve.

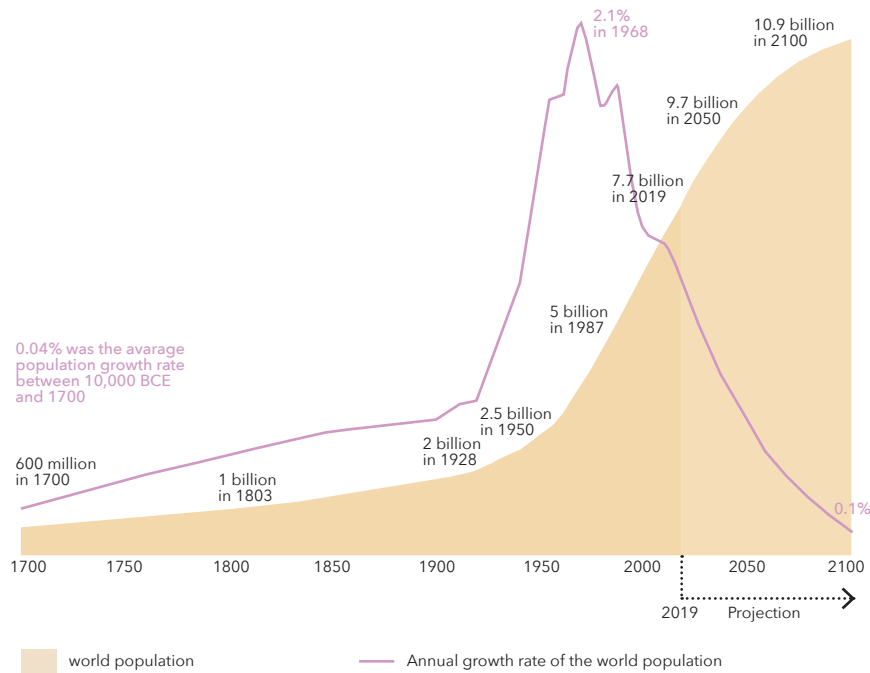


Figure 1 World Population Growth (1700-2100). Source: Roser, M., Ritchie, H., & Ortiz-Ospina, E. (2013, May 9). World population growth. Our World in Data. Retrieved June 19, 2022, from <https://ourworldindata.org/world-population-growth>, Drawing by Author

The sevenfold increase in the world's population over the last two centuries has exacerbated our impact on the environment. Undoubtedly, one of the biggest and most important challenges for the current generation is providing the world's population with space, food and resources. The population is growing exponentially: 140 million people are born yearly, and 58 million die. Therefore, the yearly number of people added to the world's population is 82 million.¹

Just 200 years ago, the world's population was just over a billion people. Since then, the world's population has jumped to 7.7 billion in 2019. As a result, the world's population is the largest in human history. If the UN forecasts are accurate, the world's population will exceed ten times in 250 years.

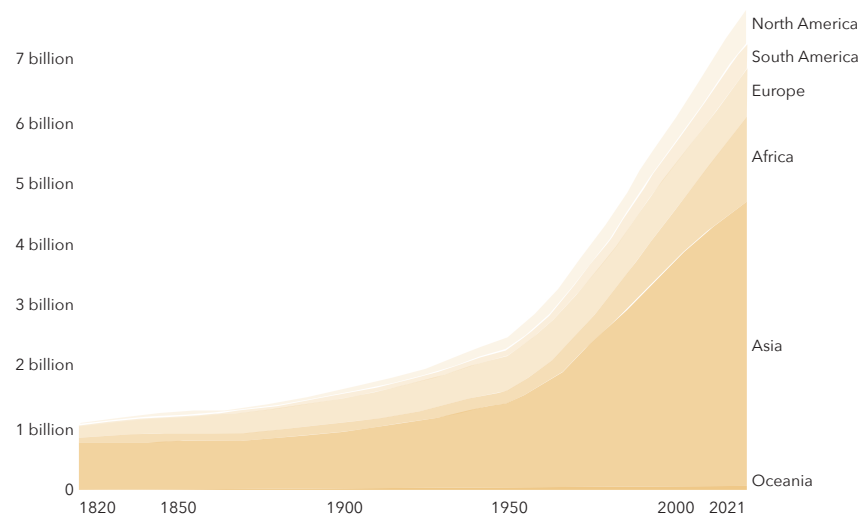


Figure 2 World Population by Region. Source: Roser, M., Ritchie, H., & Ortiz-Ospina, E. (2013, May 9). World population growth. Our World in Data. Retrieved June 19, 2022, from <https://ourworldindata.org/world-population-growth>, Drawing by Author

URBANIZATION

Fewer people live in rural areas than in urban areas. In 2018, 55% of the world's population lived in urban areas. In 1950, 30% of the world's population was urban, and by 2050 68% of the world's population will be urban. There are massive changes in the level of urbanization reached in different geographical areas. The most urbanized geographical regions are North America (82% of the urban area in 2018), Latin America and the Caribbean (81%), Europe (74%) and Oceania (68%). Urbanization in Asia is around 50%. In contrast, Africa is a rural area, with 43% of the population living in urban areas.²

Population (billions)						
Development group	1950	1970	1990	2018	2030	2050
Total population						
World	2.54	3.70	5.33	7.63	8.55	9.77
More developed regions	0.81	1.01	1.15	1.26	1.29	1.30
Less developed regions	1.72	2.69	4.18	6.37	7.26	8.47
Urban population						
World	0.75	1.35	2.29	4.22	5.17	6.68
More developed regions	0.45	0.67	0.83	0.99	1.05	1.12
Less developed regions	0.30	0.68	1.46	3.23	4.12	5.56
Rural population						
World	1.79	2.35	3.04	3.41	3.38	3.09
More developed regions	0.37	0.33	0.32	0.27	0.24	0.17
Less developed regions	1.42	2.01	2.72	3.14	3.14	2.92

Table 3 Urban and Rural Populations, 1950-2050. Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). World Urbanization Prospects: The 2018 Revision (ST/ESA/SER.A/420). New York: United Nations. Modified by Author

The construction of new cities and the expansion of old towns are two trends of urban spatial development, especially for countries with population growth, rapid urbanization and industrialization. The development and construction of new cities on the outskirts became a common urbanism phenomenon across the world.³

As the globalization economy boost, the need for new cities in developing countries increases. In addition, there is a growing demand for expanding urban space in developing countries through the transfer and distribution of labour in international industries to promote rapid development.⁴

2. THE CONSEQUENCES OF THE NEW LIBERAL ECONOMY

Back to the beginnings of the neoliberal economies of the mid-1970s, the world was astonished at the triumph of an economic system in which the United States and Britain followed a new model of remarkable economic expansion. New measures to stimulate economic growth have gradually reduced and privatized State control over the economy, expanded private initiatives in all spheres of economic activity, liberalized the domestic economy and opened it up to international markets. Moreover, deregulation measures have helped to create an atmosphere of tolerance.⁵

The consumer economy succeeded as the system covered all market segments. As a result, more people are moving to cities to take advantage of the improved services they can provide. In addition, deregulation has allowed for rapid growth in economically concentrated urban areas. As a result, in the mid-1990s, the construction of cities, services and housing became one of the main drivers of economic growth.⁶

In the mid-2000s, real estate prices rose sharply in many countries as GDP rose massively and unemployment fell strongly.⁷ As a result, the number of homes built and mortgage rates have reached an all-time high. In 2007 alone, Ireland and Spain built twice as many houses per capita as other European countries.⁸

In China, dozens of new cities and new urban structures have been built on the outskirts of cities in the last decade. Between 2000 and 2010, approximately 4.4 billion square meters of living space were constructed in this developing country, enough to accommodate 175 million people. During that period, the population grew by only 75 million.⁹ In Mexico, the housing sector grew by 12% in 2004, four times larger than Mexico's economy. Between 2000 and 2006, 3 million social housing units were built in Mexico City alone.¹⁰ Since the 1980s, tens of new cities have been constructed in Egypt in connection with existing cities. The satellite cities around Cairo aimed to accommodate over 15 million people by 2027.¹¹

In several developing countries in Latin America, Africa and Asia, many real estate developments speculate on real estate. Initially planned developments as new opportunities for low- and middle-income families, as usual in Egypt or Mexico, or developments designed to cope with the massive influx of immigrants from rural areas such as in China, are now unaffordable housing. The technical infrastructure is unadapted to the needs of low and middle-income populations. In most cases, the city's services are distanced from people, and mobility is inefficient, promoting private transport and segregation. Under these circumstances, markets have provided goods and services to the already well-served population. The failure is due to the unwise identification of the target populations and fundamental failure in urban planning and decision-making.¹²

3. DESERTED CITIES AROUND THE WORLD

In the last two decades, developing countries have witnessed a new wave of urban development centred around growing cities. New cities are usually large, built from scratch, and aim to provide social and cultural opportunities and jobs within their borders. For example, China plans to build about 100 new cities, some of which have already been built. Iran is building 18 new towns and conducting feasibility studies for more than 11 new cities. In addition, five new cities are taking place around Seoul, South Korea. Also, two partner cities in Phnom Penh, Cambodia. Also, Turkey is one of the countries that has several abandoned and deserted cities, from Burj Al Babas city in the North to Kayaköy city in the west. Finally, a lot of new towns take place in Latin America.¹³



Figure 4 Chinese deserted cities, top-down decision-making. Collage by Author

Several new satellite city projects have been proposed or are under construction in Africa. That includes the Eco-Atlantic city of Lagos, designed to reduce congestion in Lagos and combat dilapidated infrastructure. Similarly, satellite towns of Apollonia and Hope City, taking place at the periphery of Accra, are designed to reduce urban overcrowding. Also, 15 new cities have been proposed around Nairobi to revitalize the city and promote regional economic development, two of which have reached the advanced planning stages. Tatu city intends to alleviate the housing shortage in Kenya, while Konza Techno city tries to become the "Silicon Valley of Kenya". Also, there are many other new urban projects in Africa, including Roma Park near Lusaka in Zambia, Luanda and Kilamba in Angola and Kigamboni outside Teres Salamine in Tanzania.¹⁴

With the exponentially growing population globally and the worldwide high internal migration to cities, many countries started to invest in new urban environments and infrastructure, from South America to Asia. The following case studies try to shed light on this phenomenon and address the consequences of these decisions. However, as many countries have invested massive resources in building new cities (especially developing countries) to absorb the population growth and or for economic speculations, few new cities succeeded, leaving many new towns deserted.

KILAMBA NEW CITY, ANGOLA

During Angola's 2008 election campaign, President José Eduardo dos Santos pledged to build one million new homes by 2012. He aims to build new centralities or Nova Centralidades on the periphery of the cities. The Nova Cidade de Kilamba (Kilamba New City), located about 30 km south of Luanda, became the pilot project for this new type of urbanization. Unfortunately, the city did not succeed and is mostly vacant. China International Trust Investment Corporation (CITIC) has built this deserted city in an "oil for infrastructure" agreement between China and Angola. The city has 750 apartment blocks, dozens of schools, and over 100 shops.¹⁵ The \$ 3.5 billion covers 12,355 acres, is designed to accommodate about 500,000 people and is "one of the few satellite cities built by Chinese companies in Angola". However, the apartments in the city cost between 120,000 and 200,000 dollars. A three-bedroom apartment costs about 250,000 dollars. According to the World Bank, if GDP per capita per year were 5,144 dollars, nothing would help the average Angolan to afford to live there.¹⁶

On paper, a "rent-to-buy" system wanted to make Kilamba an attractive alternative to the crowded metropolis, where landlords often demand cash payment of at least six months' rent in advance. However, with monthly rent initially set at \$600 in the new city, Kilamba was out of reach for those looking to leave the Musseques and start a new life in the suburbs. Nowadays, the new town remains mainly empty. The city failed to deliver what the politicians promised, where poor decision-making, ineffective accountability and top-down urban planning remain the main factors behind this unsuccessful mega-project.



Figure 5 Kilamba Deserted City. Source: Abandoned Town - Novi Cidade de Kilamba (or Kilamba new city), near Luanda, Angola. Mental Itch. (2021, April 16). Retrieved June 17, 2022, from <https://mentallitch.com/abandoned-town-novi-cidade-de-kilamba-or-kilamba-new-city-near-luanda-angola/>



Figure 6 Kilamba Deserted City. Source: Abandoned Town - Novi Cidade de Kilamba (or Kilamba new city), near Luanda, Angola. Mental Itch. (2021, April 16). Retrieved June 17, 2022, from <https://mentalitch.com/abandoned-town-novi-cidade-de-kilamba-or-kilamba-new-city-near-luanda-angola/>



Figure 7 Kilamba Deserted City. Source: Abandoned Town - Novi Cidade de Kilamba (or Kilamba new city), near Luanda, Angola. Mental Itch. (2021, April 16). Retrieved June 17, 2022, from <https://mentalitch.com/abandoned-town-novi-cidade-de-kilamba-or-kilamba-new-city-near-luanda-angola/>

Introduction



Figure 8 Kilamba Deserted City. Source: Angolan social housing project. Angolan Social Housing Project - Major projects - CITIC Construction. (n.d.). Retrieved June 17, 2022, from https://construction.citic/en/content/details_47_2356.html



Figure 9 Kilamba Deserted City. Source: Angolan social housing project. Angolan Social Housing Project - Major projects - CITIC Construction. (n.d.). Retrieved June 17, 2022, from https://construction.citic/en/content/details_47_2356.html

DESERTED UNITS IN LATIN AMERICA

According to the latest census in Brazil in 2010, 6.1 million homes were vacant. That represents 9.02% of households in Brazil,¹⁷ exceeding the 5.4 million housing deficit by 700,000 units (of which 85% are in urban areas).¹⁸ The percentage of vacant housing and the general housing deficit contradict the social aim of real estate protected by city regulations.¹⁹

Other Latin American countries, such as Chile and Venezuela, have high and average vacancy rates of 9.6% and 7.7%, respectively. There are 424,000 vacant homes in Chile, mostly in urban areas. The area of Valparaiso has the highest percentage of vacancies. According to the last census in 2012,^{20, 21} every fifth house is vacant. Job vacancy levels are low in Peru and Nicaragua, with 4% and 2% of empty houses^{22, 23} (those figures exclude the number of vacant homes for rent or sale).²⁴

DESERTED UNITS IN CHINA

In countries like Egypt and China, the data is even more surprising. The level of vacancies in these countries is on another level. In this case, it is not only about empty houses but also about semi-empty cities where sometimes more than 80% of the housing units are empty.²⁵

In 2010, Yi Xianrui, a famous Chinese economist, who worked at the Chinese Academy of Social Sciences (CASS), publicly issued a statement based on data from the National Electricity Company. He proclaims that 64,5 million urban electricity meters generated zero consumption for more than six months. Although many dwellings were sold, they were vacant. China has enough housing to accommodate 200 million people,²⁶ while more than 187 million live in precarious housing conditions.²⁷



Figure 10 Ordos Deserted City in China. Source: Batarags, L. (2021, October 14). China has at least 65 million empty homes - enough to house the population of France. it offers a glimpse into the country's massive housing-market problem. Business Insider. Retrieved June 30, 2022, from <https://www.businessinsider.com/china-empty-homes-real-estate-evergrande-housing-market-problem-2021-10>



Figure 11 Vacant Streets in Kangbashi district of Inner Mongolia, China. Source: Batarags, L. (2021, October 14). China has at least 65 million empty homes - enough to house the population of France. it offers a glimpse into the country's massive housing-market problem. Business Insider. Retrieved June 30, 2022, from <https://www.businessinsider.com/china-empty-homes-real-estate-evergrande-housing-market-problem-2021-10>



Figure 12 Empty streets in Tianjin, was been expected to be China's Manhattan, it is a deserted city. Source: Batarags, L. (2021, October 14). China has at least 65 million empty homes - enough to house the population of France. it offers a glimpse into the country's massive housing-market problem. Business Insider. Retrieved June 30, 2022, from <https://www.businessinsider.com/china-empty-homes-real-estate-evergrande-housing-market-problem-2021-10>

From 2007 to 2008, after the outbreak of the crisis, the area of completed housing remaining unsold per year in China increased significantly from 67 to 90 million m² (an area that can accommodate up to 1 million people).²⁸ Since then, China's national statistics agency has stopped publishing such data. The sixth national census, meant to clarify critical data like the housing vacancy rate in April 2011, has yet to be released.²⁹

The lack of statistical transparency in this regard leaves the truth about vacancies in China in the dark. However, facts and evidence clearly show that the phenomenon is an epidemic. That is the case of the city of Kangbashi, a satellite city of Ordos in the autonomous region of Inner Mongolia, which was planned for 1 million inhabitants but had only 50,000 inhabitants in 2010.³⁰ 90% of residential buildings in Kangbashi have been purchased, but only 5% are occupied. Government employees and entrepreneurs who go to work every day in Kangbashi return to the old town, Dongsheng, where their children attend school.³¹

Analysts estimate there could be as many as a dozen towns like the Ordos in the country, with sprawling new developments and suburbs remaining nearly deserted. In the southern city of Kunming, for example, an area of 65 square kilometres called Chenggong New Area has sounded the alarm over a similar situation of empty streets, buildings and offices. Dantu City has been vacant for over a decade. In northeast Tianjin, golf courses, hot springs and thousands of homes in the district stand empty five years after completion.³²

Residential vacancy rates in China have averaged 20% for all completed residential properties over the past five years and as high as 60-90% for luxury properties and apartments. The central government has already taken steps to control and curb the housing market. Nevertheless, the Chinese government plans to build 36 million affordable housing units under the current five-year plan to curb rising prices in the private housing market.³³

CAIRO'S DESERTED CITIES

In Africa, there are no confirmed data or studies on vacant homes in most countries, but a similar phenomenon of empty cities is very dominant in Egypt. Vacancy rates are very high in urban areas, reaching 20-30% of the housing stock. The idea of creating new cities around Cairo's desert was first developed in the Masterplan of 1975. The government intended to decentralize the population in Cairo and reduce the congestion of human settlements in the Nile Valley, which drives people out of the city and provides alternatives to informal settlements.³⁴

The early Masterplan's concept of Cairo focused on building a ring road around Cairo to control the urban growth and to construct the 10th of Ramadan city, Ubur city in the east, the 6th of October city in the west and the 15th of May in the south to attract the growing Egyptian population and to absorb the migration from the rural areas to Cairo and control the informal growth of Cairo.³⁵

In 1996, Greater Cairo (including its desert cities) reached a population of 13 million inhabitants. The expectations were that the population in 2000 would reach 16 million inhabitants. However, the General Authority for Urban Planning (GOPP) had a new population target of 24 million by 2020.³⁶ The Masterplan intended to draw nearly 6 million inhabitants of the new 8 million in the desert cities. The other 2 million people would move to Cairo. That plan triggered massive investments in Cairo's desert cities, and Cairo received very modest attention and resources.³⁷

The 2006 census listed 409,000 housing built over the eight desert cities around Cairo. Nevertheless, most of those units were vacant. Only 150,000 housing units were inhabited, that is only 37 per cent. That ratio of one to three reflects the failure of these mega projects that absorbed most of Cairo's urban investments in the last years.³⁸ In 2006 only 602,000 people lived in the new cities, representing only 14% of Cairo's population growth in those ten years.³⁹

Although a fraction of the target population has moved to these cities, building policies have been maintained and even increased, with more new towns and government

investments. With suburban density patterns and services primarily geared towards private cars, living conditions in new cities remain unsustainable and problematic for most of the population. Workers prefer to commute from their homes in Cairo and other cities to the industrial areas in new towns daily.⁴⁰

DESERTED UNITS IN THE DEVELOPED COUNTRIES

The phenomenon of vacant homes is generally dominant where the housing market has exploded. Nearly 7 million homes were built in Spain between 2001 and 2010, while population growth did not exceed 5.2 million over the same period.⁴¹ At the same time, property prices have more than doubled. Today, Spain has more vacant and unoccupied homes than any other European country. The number of vacant housing units could reach 6 million,^{42,43} representing 85% of homes built between 2001 and 2010 and almost double the figure for 2001.⁴⁴

Vacancy rates in Finland, Germany, Denmark and France are between 5% and 10%. Other Western European countries have vacancy rates below 5%, with Sweden (1.7%) and the Netherlands (2.2%) having the lowest vacancy rates.⁴⁵

The big picture shows millions of empty houses, while at the same time, thousands of people are evicted due to mortgage insolvency. The number of evictions in Spain has tripled since the start of the crisis, with nearly 300,000 evictions happening before mid-2011. Evictions continued to rise; thousands of families have been left homeless. Almost 200,000 evictions have been carried out since the financial crisis (2007-2008) began.⁴⁶ An average of 110 families being evicted every day since 2007. In the case of Ireland, only a third of the nearly 300,000 vacant homes would be enough to meet the needs of 98,000 people in need of housing assistance.⁴⁷ In the UK, one million vacant homes could house half the people who need housing.⁴⁸

In the United States, in 2011, 8.4% of the homes were vacant, almost 11 million empty homes nationwide.⁴⁹ Only a third of these homes would be needed to meet the housing needs of an estimated 3.5 million homeless people at some point during the year. Eight million executions have been carried out since 2007, an average of 4,400 per day.^{50,51}

4. CONCLUSION

In countries where construction was the economy's driving force before the crisis in 2007-2008, intensive urban developments were allowed with financial interests. That led to creating housing bubbles which burst dramatically and changed the housing market, with sharp falls in property prices and the collapse of the construction sector. In the case of Spain, corruption linked to urban development has played a role in the process, with abuses of power by public authorities in land speculation for illicit financial gain.

In China, since the liberalization of the real estate market in 1999, private construction has grown exponentially. It has increasingly become a driver of economic development, boosted by rapid urbanization, migration and urban growth. As a result, property in China was a safe investment against inflation. As seen in more developed countries, real estate speculation dominated the market, driving up property prices and putting them out of the economic reach of lower and middle-income Chinese. Low-interest loans to buyers have speeded up real estate investment, fueled by cheap labour and land costs. At the same time, China had low rent levels rooted in the country's old socialist policies, which left millions of properties unused.⁵²

Although Egypt has a high rate of population growth and internal migration from the rural areas to the urban areas in its heydays, Egypt has millions of empty residential units. The high vacancy rates in Egypt are mainly due to the property speculation that has fueled the property boom in the desert around Cairo since the 1970s/1980s and the excessive development of luxury buildings and exclusive gated communities. Not only that, massive recourses were invested in the form of social housing in the desert towns around Cairo. However, these investments were not supported by fundamental needs such as jobs, services, educational institutions, healthcare institutions and public transportation.⁵³

The rise in the vacancy rate in Mexico also coincides with corruption, ineffective accountability and poor decision-making mechanisms. The States with the highest vacancy rates, such as Baja California, Chihuahua, Zacatecas and Tamaulipas, are all located on the border with the United States or are part of the group of labour-exporting States. These areas have suffered more heavily than other parts of the country from the effects of the global recession (2007-2008), which helps explain why roughly one in four documented uninhabited homes in Mexico in 2010 (23%) were in this region.⁵⁴

The topic of deserted cities and housing is pandemic on a global scale. Not all deserted cities and housing units share the same illness and cause, yet generally, they are due to an ineffective strategic decision-making mechanism.

5. HOW TO BRING LIFE TO THE DESERTED CITIES AND CREATE BETTER SCENARIOS?

Cairo's deserted cities will be explored in detail in this research. The aim is to understand the reasoning behind these massive investments and to delve deeply into the forces that made the cities unsuccessful. Shedding light on that theme does not represent the situation of only the new Egyptian cities. However, it tries to illustrate that global phenomenon as many unsuccessful new towns exist across the globe.

This research aims to create a platform of possibilities to trigger urbanity in Cairo's deserted cities. The deserted cities of Cairo are a pilot project to understand the reasoning behind their failure and test different scenarios to urbanize them. These propositions intend to create solutions that could later be used in other contexts.

Finally, the population around the globe will continue to grow dramatically in the coming years. The developing countries will have the most significant share of this growth. Also, developing countries have a high rate of internal migration from rural areas to urban environments. That puts many countries in a challenging scenario where the need to propose a better strategy of building new cities and not replicating the mistakes of the illustrated unsuccessful new towns is a must.

This research will propose a different methodology for developing a new urban environment by changing how urban design and decision-making scenarios are made. By capitalising on the potential of bottom-up initiatives and giving people a better chance to integrate their needs, bottom-up activities could catalyse change to help urbanise cities effectively.

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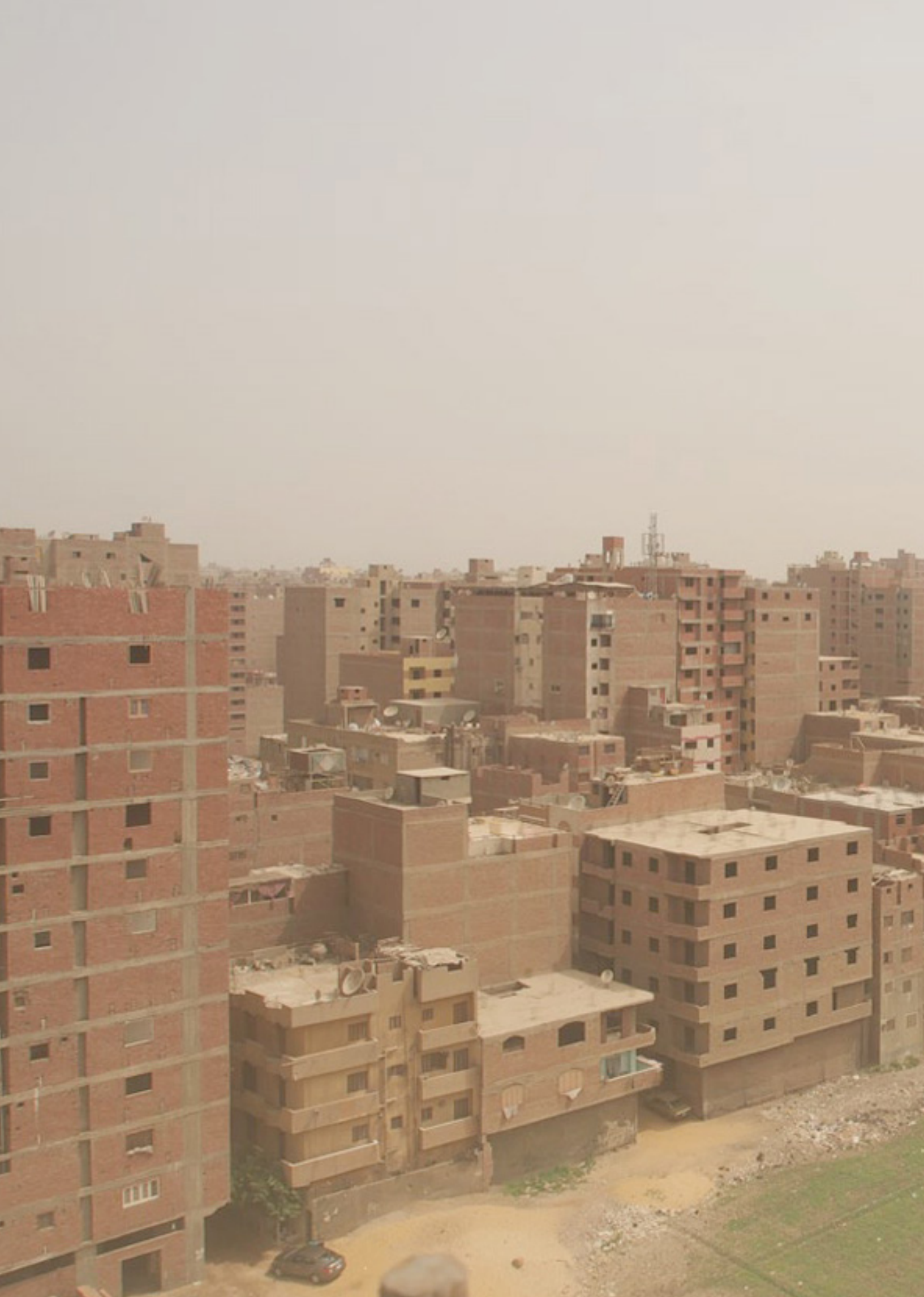
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CHAPTER 1 DECENTRALIZING EGYPT

The doctrine of desert cities was launched after the 1973 War to build a series of satellite cities on the periphery of Cairo. Nevertheless, building mono-functional cities without an effective mobility system and an economic base has left these cities nearly empty. As a result, many of these cities remain deserted and dusty ghost towns. However, the policy of creating desert cities continues.

"It is from these settlements, where the economy has nearly collapsed. The new cities built by the state are largely vacant, unused and failed on the social and economic levels to respond to population needs in addition to failing to negotiate the relationship between peasant society, its relationship to the land, agriculture and economy and its transformation into a semi-urbanized society relying less on agriculture."¹

As Egyptians say, Cairo is Egypt and Egypt is Cairo, in the sense that the capital embodies most economic activities, all governmental administrations, embassies, headquarters and educational institutions. As a result, Cairo became the hub of all Egyptian interactions over the past decades. That centralisation model is not only in Egypt but also in developed countries like France and England.

Urban development rose quickly after Egyptian independence in 1922. After almost 40 years of British colonisation, Cairo became the first city in Egypt to reach more than a million inhabitants in 1927. That is nearly 7.5 per cent of the Egyptian population at that time. Also, Alexandria's population spiked, reaching 600,000 inhabitants at that time. After only 20 years, the number of inhabitants of both cities doubled. Around 11 per cent of the Egyptians lived in Cairo, with 2,076,000 inhabitants. Alexandria reached 950,000 inhabitants at that time. After the war with Israel in 1973, Egypt had three million-inhabitants cities, Cairo had almost five million residents, Alexandria 2.3 million and Giza 1.2 million.²

In 1996, the population of Cairo spiked to nearly seven million. In 2006 it reached 8 million. Now, Greater Cairo has 25 million inhabitants plus three million daily commuters from neighbouring towns and villages. Also, Giza had 2 million inhabitants in 1996. It had almost nine million residents in 2017. Qalyubia also had around six million inhabitants in 2017. Therefore, Cairo, Giza and Qalyubia have formed a metropolitan megacity called Greater Cairo.³ On the other hand, Alexandria reached 3.3 million in 1996 and continued its exponential growth to have 5.2 million inhabitants in 2017.

EGYPT IN THE GLOBAL CONTEXT

Egypt was always at the heart of the map. Its strategic location gave it an edge in political, economic, religious and financial aspects. Thus, it was a target for many invaders over the last 5,000 years. In the 19th century, the Suez Canal took place as a national project that triggered many national mega projects like the expansion of the ports of Alexandria and the construction of Port Said ports.⁴ As a result, Egypt became better

connected to the rest of the world, and Cairo succeeded in attracting global economic and cultural initiatives. Also, Cairo is seen as the centre of the Arabic and the Islamic world, connecting both Arabic parts in Africa and Asia. Therefore, its political, social, religious and financial influence is strong.⁵

The Egyptian Republic was founded in 1952. At that time, Cairo played a fundamental factor in the region, mainly as an Islamic pillar. Thanks to Al-Azhar Mosque and University, one of the oldest Islamic institutes, international students studying in Cairo and many educational activities and exchanges took place.⁶ Over the years, Cairo succeeded in keeping its influential role in the Arabic world, from educational facilities like universities to cultural institutes like the opera house, theatres and cinemas. In addition, the city has succeeded in keeping its role as the centre of industrial and financial activities in Egypt.⁷

After the British colonisation, the country took some industrial plans to change its financial situation in Egypt. They pushed the industrial field from 8 per cent in 1952 to 42 per cent in 1970. After the war in 1973, Sadat took some economic decisions to have liberalisation and an open market. As a result, the country started privatising and boosting the privately owned manufacturing industries. New satellite cities as 6th of October and 10th of Ramadan City had a share in that industrial boost, where more than half of the industrial sector moved there by the 1980s. In 2001, Greater Cairo's GDP share was nearly 45% of the national GDP and had almost 41% of the country's manufacturing share.⁸ On the other hand, centralisation has caused many epidemic problems such as pollution, overpopulation, uncontrolled "informality", social unrest, traffic congestion, inefficiency in many sectors and an exploited city infrastructure.

TOWARDS DECENTRALIZATION

The aim to attract people to live away from the Nile Valley has been on many national plans over the last fifty years, from President Sadat to President Abdel-Fattah el-Sisi. That took place in two forms: 1. large-scale new desert cities and 2. land reclamation to rural neighbourhoods. Those development projects have been repeated in many national visions, with a similar goal and perhaps a different implementation process. For example, building a new capital in President Sadat's time called Sadat city and the New Administrative Capital City. Likewise, the North West Coast in Egypt aimed to attract the growing Egyptian population away from the overpopulated cities. The development plans took place fifty years ago and are still ongoing (from New Amerya City to New Borg El-Arab City to the small towns that serve only national tourists and finally the New Alamein City).⁹

The first desert city close to the capital was the 10th of Ramadan City in 1977. That was President's Sadat first new city in his national vision after the war with Israel. In 1977, the town became an independent economic hub, supported by factories, industries, subsidized plots and state-built housing units. The city's target population was half a million, primarily workers and their families.

The French institute "Institut d'Aménagement et d'Urbanisme de la Région Ile de France" (IAURIF) submitted a study paper to the General Organization for Physical Planning (GOPP) in 1982 to propose a new Masterplan for Cairo. Also, the USAID suggested a National Urban Policy paper in 1982, which did not support the notion of building new desert cities to counter the urban challenges, but to invest in enhancing the urban regions in Upper Egypt, the Suez Canal and the rural villages. The study from IAURIF proposed a similar strategy, but instead of building new cities from scratch and investing large amounts of resources, build satellite cities close to existing towns and give the possibility to people to profit from the services and infrastructure of the existing cities.

The State did not support the USAID study. However, President Husni Mubarak approved the IAURIF studies in 1983. After that, the State gave the green light to 9 new satellite cities as part of the second-generation new cities strategy in 1986. Also, in 2000, the government launched seven new towns as part of the third generation as satellite cities.

The New Urban Communities had a series of objects that define its planning criteria:

1. Establish new urban communities away from the Nile Valley and attract the growing population.
2. Create affordable housing units in the new cities to counter the "informal" settlements on agricultural land.
3. Establish some plots for the National Social Housing Program for low-income people. Also, it provides small lands for middle-income families to build housing units.
4. Boost the economy by supporting the building of new cities, as that directly influences the economy and creates new jobs.
5. Activate the main roads between large cities to integrate the new urban communities with the existing towns.
6. Support the availability of housing dwellings in the new urban communities to limit the internal population movement from undeveloped villages to cities like Cairo and Alexandria.

THE NEW URBAN COMMUNITIES CHALLENGES

All new towns from President Sadat till now have not achieved their targeted population and are not even close to half of the targeted number. The State and the New Urban Communities have maximized the target number of residents in the new towns and expect 2032 to reach the target number of new residents. Even with the current population growth, if the methodology of building new cities in the desert did not change, most Egyptians still favour living in the old-dense towns for several reasons.

Transportation is very challenging from/to Cairo. The independent notion of building a financial base and a job-generating hub was ineffective in most new cities, leaving the urban environment mono-functional and unattractive to new residents. Also, service delivery programmes, facilities and infrastructure were insufficient.

As social justice was one of the State's targets, it was barely accomplished in most new cities as the housing units were still unaffordable compared to other options in the existing towns. As a result, the desert cities have consumed lots of resources, time and energy and failed to generate their targeted revenues.

The New Urban Communities had more than forty years to achieve its goals and prove that its methodology in solving the urban problems of Egypt is doable. Unfortunately, it seems like the NUCA has succeeded in generating profits and maximized its revenues by selling the national lands to investors. The contrary aim of social justice and building low-income housing units for the Egyptians. As land and the city should belong to everyone, it should have a social responsibility rather than an economic-lucrative process of generating and selling lands to investors.¹⁰ Also, the principle of social justice and creating affordable housing for the majority is rarely efficient. The generation of the new cities seems to be not for the majority but for those with the resources. ("Egypt's New Cities: Neither Just nor Efficient" 2015)¹¹

EGYPT 2052 VISION

The Egyptian population is growing exponentially, reaching 102 million inhabitants in 2020. The Egyptian land is around 1 million square meters. However, most Egyptians have lived in the Nile Valley for thousands of years. Therefore, the Egyptian population lives on only 5-7% of the Egyptian land. Over the last fifty years, the political leadership tried to solve this challenge, from president Sadat's new cities in 1974 to President Abdel-Fattah El-Sisi's vision of "Egypt 2052" and the fourth-generation cities.

The State has announced their urbanistic plan for "Egypt 2052", which will move the growing Egyptian population away from the Nile river and expand the liveable space from 7% of Egypt's land to 11%. The optimistic plan prepared by Mostafa Matbouly and his team between 2009-2012 and the desired megaprojects will take around 40 years of construction. The strategy targets the Physical, Economic, Social and Administrative dimensions with Short-term, Intermediate-term and Long-term Plans. On top of the main criteria that made the State propose 2052 were the following:

1. Urban density: Due to the rapid increase in the Egyptian population, the population Density in Egypt has jumped to one of the highest international rates, with 1850 residents per km², and green areas have decreased a lot due to the increased building activities over the last fifty years. The Ratio of green spaces in cities like Cairo to the residents is low, less than 1m² per person, one of the lowest levels around the world.¹²
2. Poverty: 25% of the Egyptians live under the poverty line (Egypt Census 2017).
3. Unemployment: The average unemployment rate has reached 12% in Egypt and 16% in urban areas (Egypt Census 2017).
4. Illiteracy: Egypt's illiteracy rate has reached 25.8% (Egypt Census 2017).
5. Water Poverty: The Water Poverty Limit is around 1000m³ per person yearly (World Health Organization WHO). In 2006, 772m³ per year was the average water limit per person in Egypt; Egypt suffers from water poverty.

The Egyptian population is rapidly increasing, but the water sources did not increase similarly. The new Ethiopia Dame probably will decrease the amount of water reaching Egypt. As a result, Egypt's Water Level will decrease in the coming years if no fundamental change occurs.¹³

Figures (1) and (2) represent the future re-demarcated borders of Egypt with ten regions and 32 governates. Each Region has its own geographic and demographic characteristics. Figure (3) illustrates urban settlements, types of possible industries, agriculture, tourism and accessibility to these new regions. There are two main phases for this optimistic project. The first part of the plan is to be achieved by 2027. The second phase is the final phase of the project, which will finish by 2052, where all the infrastructure, industries and housing plans are to be complete.

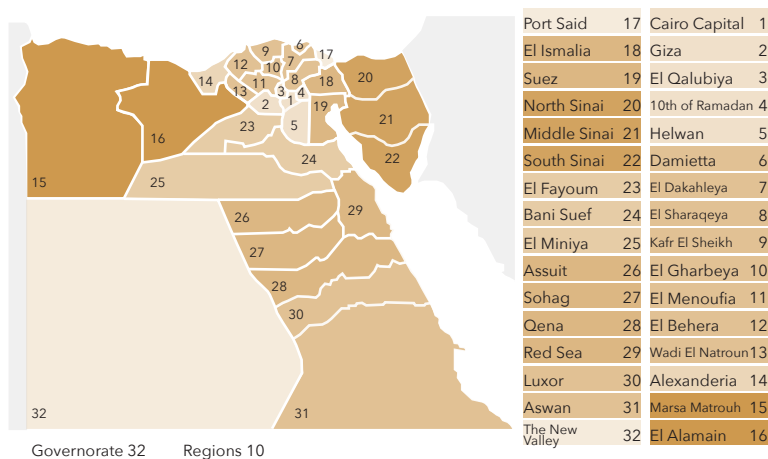


Figure 1 The new Re-demarcated Borders of Egyptian Governorates. Source: (GOPP 2012), Drawing by Author

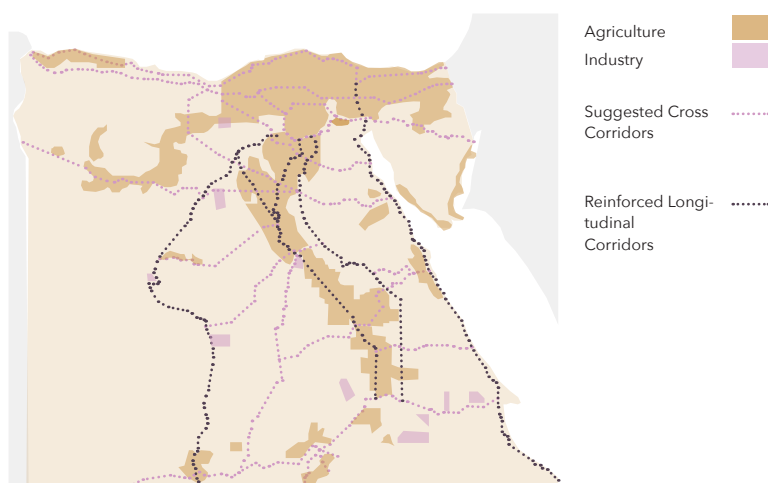


Figure 2 "Vision 2052" Expected New Inhabitants and Employment. Source: (GOPP 2012), Drawing by Author

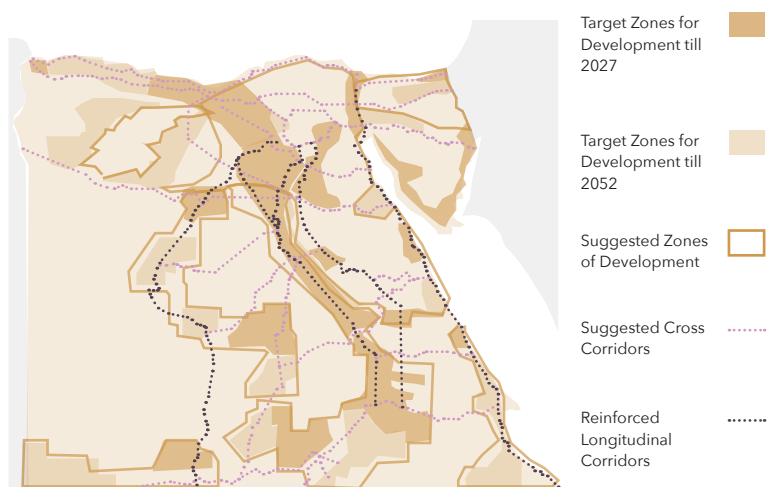


Figure 3 The Suggested Localized Projects of "Vision 2052". Source: (GOPP 2012), Drawing by Author

THE NEW TOWNS AROUND CAIRO FROM FIRST TO FOURTH GENERATION CITIES

There are presently nine new towns that can be considered part of Greater Cairo: Sixth of October, Tenth of Ramadan, Fifteenth of May, al Ubur, al-Shuruq, Sheikh Zayed, New Cairo, al-Bade, and the New Administrative Capital. These cities are part of Egypt's New Towns Program, which started in 1977, was codified under Law no. 59 of 1979, and is implemented by the New Urban Communities Authority (NUCA) of the Ministry of Housing, Utilities, and Urban Development. Although the program is nationwide in scope and currently boasts some twenty new towns established throughout Egypt, the eight new towns around Cairo have captured most State investments and private capital. In 2006 the census recorded a combined population in the desert cities around Cairo of 610,000 individuals, less than four per cent of the inhabitants of Greater Cairo at the time.¹⁴

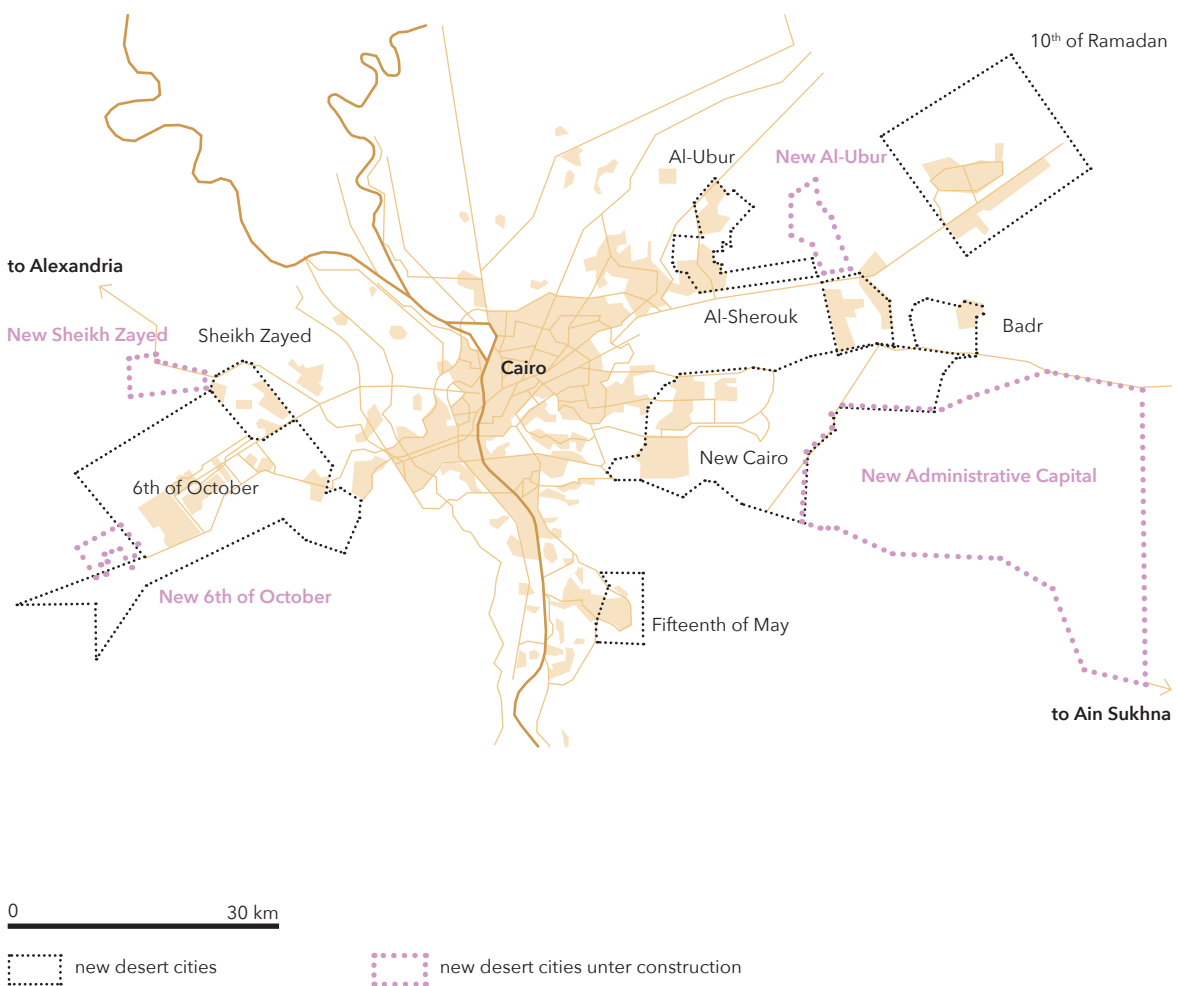


Figure 4 Desert Cities around Cairo in 2021. Drawing by Author

Although population growth has been very disappointing compared to planned targets, these new towns have absorbed huge public investments over thirty years. Moreover, these investments are continuing and even increasing! Infrastructure services like roads, sewers, water, street lighting, public spaces, landscaping, and treatment plants accounted for most of these investments.¹⁵

Desert City	Construction Year	Census Population 1986	Census Population 1996	Census Population 2006	Census Population 2014	GOPP Population Estimate 2005	2006 Census Vo. of Housing Units	2006 Census % of Housing Units Vacant	Area of New Town as of 2009
10th of Ramadan	1997	8,509	47,833	124,120	430,000	500,000	n.a.	n.a.	208 km ²
15th of May	1978	24,106	65,560	90,324	200,000	180,000	36,434	35.1	16 km ²
6th of October	1981	528	35,354	157,135	1,350,000	500,000	142,244	62.8	413 km ²
Badr	1982	---	248	17,172	85,000	60,000	21,381	71.1	52 km ²
Al-Ubur	1988	---	997	43,802	300,000	100,000	40,261	64.4	54 km ²
Al-Shuruq	1995	---	---	20,983	170,000	62,000	27,764	79.2	42 km ²
Sheikh Zayed	1995	---	---	29,553	233,000	48,000	32,876	68.6	38 km ²
New Cairo	2000	---	---	118,678	1,200,000	302,000	108,220	64.1	351 km ²
New Administrative Capital	2015	---	---	---	---	---	---	---	688 km ²
Total Desert Cities	---	33,143	149,992	601,767	2,768,000	1,752,000	409,180	62.8	1862 km ²
Total Greater Cairo	---	10,994,000	13,231,000	16,292,000	22,000,000	16,200,000	7,369,128	---	---
% of GC Population in Desert Cities	---	0.3	1.1	3.7	13	10.8	---	---	---

Table 1 The ratio between the targeted population and the real population. Sources: Arab Republic of Egypt. Al-Jihaz al-Markazi lil-Ta'bi'a al-'Amma wal-Ihsa'. Al-Ta'dad al-'am lil-Sukkan wal-iskan wal-munsa'at (Census of Egypt) various years; for areas of new town concessions, calculated from GOPP and Google Earth. By: David Sims.) Modified by Author

NORTHCOAST FROM FIRST TO FOURTH GENERATION CITIES

The North West Coast development was a fundamental component in the national vision of "Egypt 2052". According to governmental decree number 450 in 1980, the region would be under the supervision and development of the New Urban Communities. Tourism was the vehicle of urban development and expansion from the government's point of view. According to (Ilaco and Pacer; PUD and ORPLAN 1978) studies, the development plans trigger tourism, industries, fishing activities and land reclamation.

Unfortunately, after four decades of developing the North West Coast, it failed to attract the targeted number of inhabitants. Furthermore, due to the ineffective international connection, international tourism did not succeed as expected. As a result, limited job opportunities were created, creating a slow regional urban development and growth.

The Northern West Coast was still in the government's focus after the "Egypt 2052" vision. However, there is a potential from the State's view to develop around 40 km coastal long of touristic, agricultural and industrial activities. Also, the State sees possibilities of using underground water and reusing rainwater, wind and sun energy to produce resources for those investments.

TOURISM

Tourism was the core vehicle of attracting inhabitants to the North West Coast and bringing economic activities from 1977 till nowadays plans. Tourism focuses on both the coastal development and the desert realm on the other side of the coast. For tourism to take place, explosive bombs and remnants from the war had to be cleared, as the Al-Alamein area was a location that experienced lots of intensive battles.

AGRICULTURE

The agricultural projects intend to farm around 55 thousand acres of land between Dabaa and Al-Alamein regions. The plan is to water sustainably, using the El Hammam canal, which has almost 100 million water m³/year. Also, the project intends to invest in growing plants with a high financial value that could thrive in desert climates.

INDUSTRY

Create an industrial-free zone in the region and create an integrated area that merges customs-free zones with industrial activities. Also, support the process of creating gypsum and establishing oil extracting fields from Jatropha trees used as fuel.



Figure 5 Mobility infrastructure and zoning in North West Coast Capmas. www.capmas.gov.eg/Pages/SemanticIssuesPage.aspx?page_id=6116, Drawing by Author

THE NEW FOURTH-GENERATION CITIES IN EGYPT

The State announced its plans in September 2018 to build more than 20 new fourth-generation cities throughout Egypt. The announcement came from the Prime Minister, the Housing Minister and the New Urban Communities Authority (NUCA). The plan is to distribute the over 20 fourth-generation cities around Egypt on 580,000 acres to house 30 million inhabitants.¹⁶

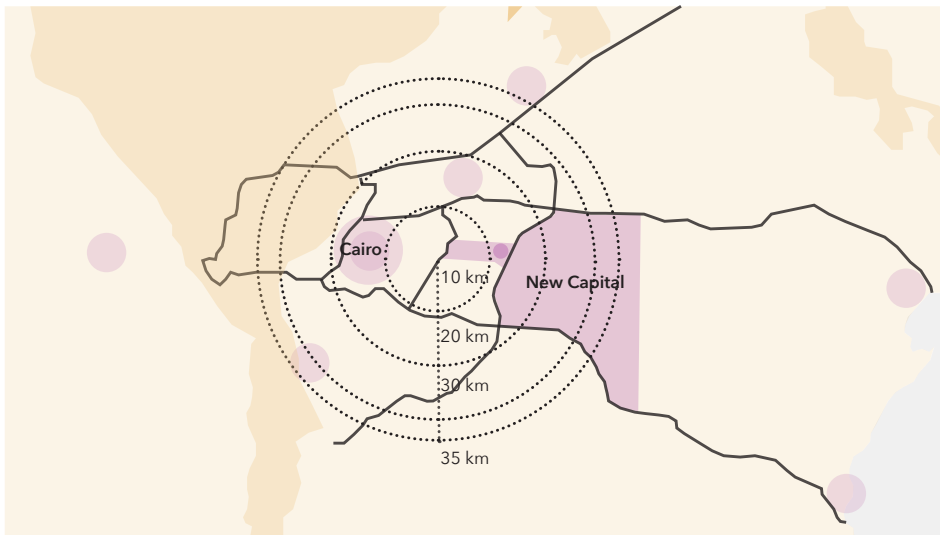
The State hopes the new fourth-generation cities could trigger economic activities and attract foreign and local investors to invest in Egypt. The New Administrative Capital and New Al Alamin are some of the first fourth-generation cities to be completed due to their strategic importance from the State's point of view. (invest gate)¹⁷

NEW ADMINISTRATIVE CAPITAL (NAC)

The State has found a location for the New Capital to thrive. It is between the Old Capital and Suez city, allowing the New Capital City to be a significant linkage between both hubs. The State is investing in the Suez city, with extensions to the old Suez Canal. In addition, they are introducing a new international economic hub and large-scale investments in the infrastructure to link the East to the West, from high-speed trains to advanced tunnels, bridges and highways.

Two monorail trains and a fast train will be in the New Administrative Capital to connect it with the Capital and the neighbouring cities. The government is optimistic about attracting 6.5 million inhabitants by 2050. The State markets the 35 km long "green river" as a blood vessel to connect 20 residential districts. Also, the new central district will take place in the New Administrative Capital, with a group of skyscrapers and the

highest tower in Africa. Also, a new Governmental base, a new parliament, 32 ministries, a new Military base, a new presidential palace, foreign embassies and a new advanced infrastructure system. (invest gate)¹⁸



● Site Area

New Cairo Capital, Area: 78,4000 Hectare, Distance from centre of Cairo: 35 km

Figure 6 The location and size of the New Administrative Capital. Source: NUCA, Drawing by Author

"The most ambitious aspect of the development of the New Capital City is its commercial district, christened Capital Park. Capital Park spans 23 square kilometres, and when fully built out, it will offer an eye-watering 183m sq ft of commercial space. The area has been broken down into three districts: Gateway, Downtown and the Central Business District (CBD)."¹⁹The Central Park will represent the "commercial artery" of the new Capital, according to Dar, and once completed is expected to create more than 450,000 jobs and be home to around 180,000 people.²⁰ In addition, with parks and tree-lined avenues, the city will consume an estimated 650,000 cubic meters of water from the nation's scarce resources a day.²¹

NEW AL-ALAMEIN CITY

Another fourth-generation city in the "Egypt 2052 vision" is Al-Alamein City. The General Organization for Physical Planning (GOPP) prepared the vision. Aiming to trigger the development of the North Coast, create job opportunities, allow all the neighbouring seasonal cities to function not only in summer, create affordable housing and public transportation and allow free access for pedestrians to the waterfront. (GOPP 2011)

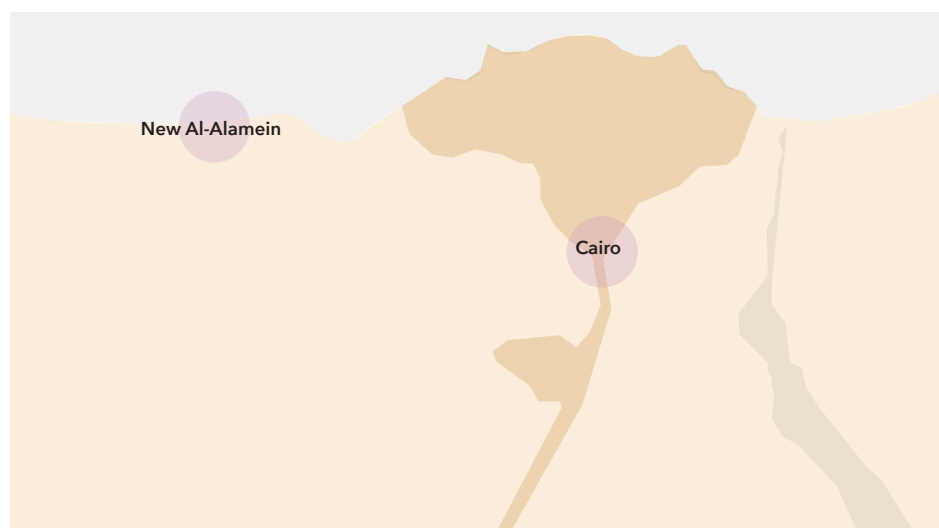


Figure 7 New Al-Alamein City Location, Drawing by Author

Al-Alamein city is between Alexandria and Matrouh, with a total area of 41,703 acres. It is located 34 kilometres west of Alexandria on 50,000 acres to house 3 million people in the city's first phase. The city's location has a high opportunity to trigger tourism and new economic activities. (Associated Consultant Team 2015)

The planning proposal has three pillars:

First, urban legislation: preparing new urban management and decision-making processes.

Second, urban finance: connecting urban development and urban planning.

Third, urban planning proposes an efficient structure that combines the three pillars.

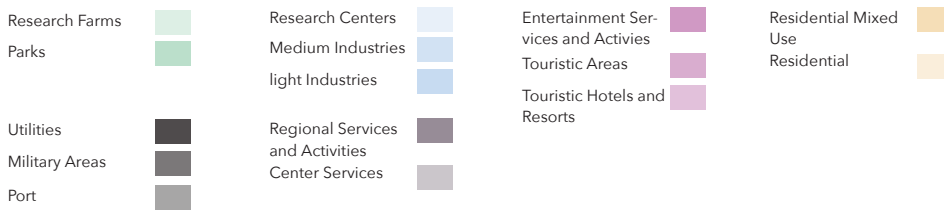
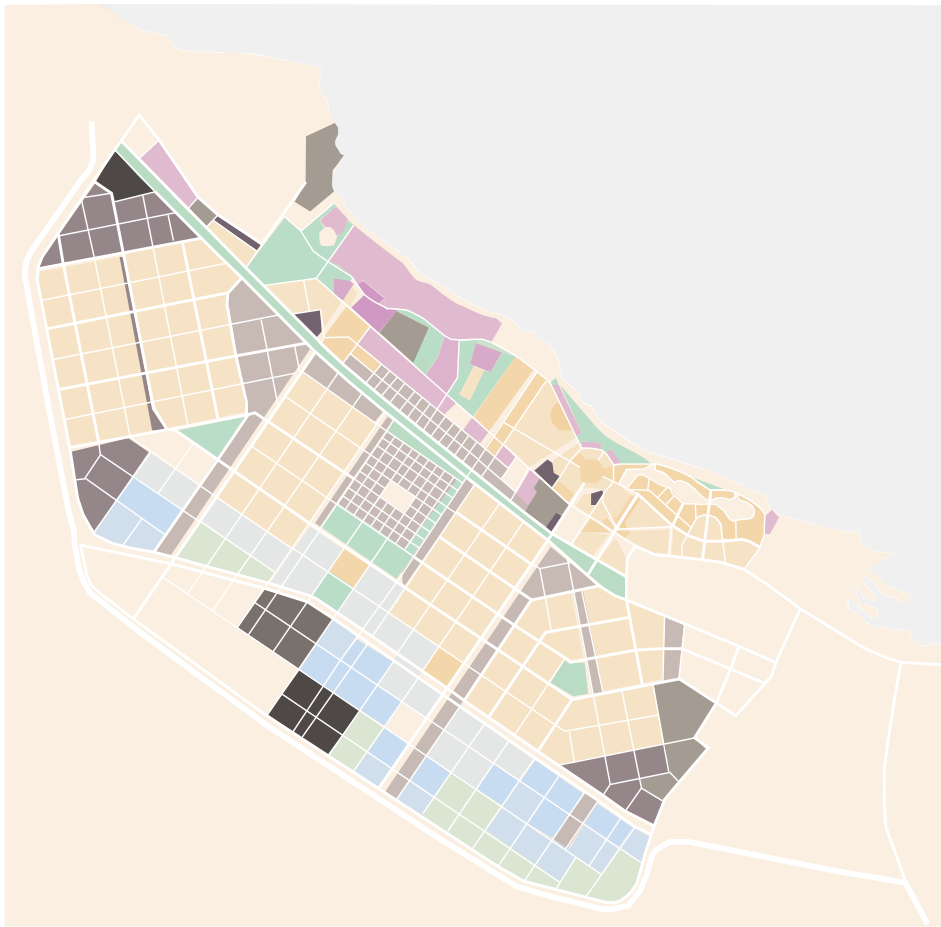


Figure 8 The Master Plan and zoning of the New Al-Alamein City. Attia, Sahar, et al. *New Cities and Community Extensions in Egypt and the Middle East Visions and Challenges*. Springer, 2019; Drawing by Author

NEW ASWAN CITY

New Aswan city is seen by the State not as an extension of the old urban environment yet, as a new city with its services, infrastructure and mobility. There are almost 168 completed social housing buildings, where 336 social housing buildings will take place. In addition, the authority has allocated EGP 1.5 bn for residential units.²²



Figure 9 New Aswan City Location, Drawing by Author



Figure 10 New Aswan City Masterplan. Source: NUCA



Figure 11 New Aswan City. Source: Reddit.com

New Aswan city is only 2 kilometres away from Aswan. On a total of 22,390 acres, New Aswan will take place with EGP 3.5 bn of total investments as the government is targeting 850,000 to live and work there. Since the existing city is very active in tourism, the new town will have a touristic promenade directly on the Nile, with various entertainment activities, hotels, an Olympic village on 505 acres, an industrial area on 190 acres and sports facilities. As the new city is part of the fourth-generation cities, perhaps this will allow it to have more sustainable infrastructures and better mobility systems to attract people to live there.

NEW MANSOURA

New Mansoura is located only 54 kilometres from the original Mansoura city, on 2,000 acres of land. With a budget of EGP 45 bn, the completed city will target around three million inhabitants, where various service deliveries, educational sectors, Mansoura university on 67 acres, housing units, 12 hospitals, five sports clubs, a 2 km long touristic marina and three cultural centres.



Figure 12 New Mansoura City Location, Drawing by Author

The residential sector will have thirty skyscrapers, 1180 villas, 664 social housing dwellings and 58 high-end residential dwellings. The city development will take place in four different phases, where each part will have a separate waterfront, water platform with sports activities, residential units and pedestrian promenades. Since the new city is close to both Mansoura city and Damietta city, there is probably a high possibility for the growing Egyptian population to move to New Mansoura.²³



Figure 13 The first phase of New Mansoura City, Master Plan. "Zahya New Mansoura: City Edge Developments: Apartments & Villas." Egypt Real Estate Hub, www.egyptrealestatehub.co.uk/zahya-new-mansoura-city-edge

A REFLECTION ON THE FOURTH-GENERATION EGYPTIAN CITIES

It is too early to decide if the fourth-generation cities have replicated the same problems as the existing desert cities. However, what is clear for the time being is that the State has changed some of its fundamental concepts toward building new cities. On top of these decisions is sustainable public transport. Nevertheless, whether the proposed mobility systems are efficient enough for the targeted population in fourth-generation cities remains unanswered.

Still, it remains unclear how the State plans to water the large amounts of green areas and surfaces in the middle of the desert. Many proposed fourth-generation towns have enormous amounts of green spaces, yet Egypt suffers from water shortage. Moreover, since the government promotes the fourth-generation cities to be sustainable and eco-friendly, water supply and resources remain unclear.

The fourth-generation urban environments are the first generation to have high-rise buildings. Although, that might support the notion of density in the new urban environment and help have a better public mobility system due to the higher densities. However, most of the presented skyscrapers have glass facades in a desert context, full of sunlight and high temperatures. Therefore, perhaps it is wiser not to market the fourth-generation cities as sustainable and eco-friendly, as many notions do not support that aim.

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- 14** David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*, Chapter 6
- 15** There is a ninth new town that has been on GOPP maps for years—al-Amal, some forty-five kilometers east of Cairo on the 'Ain Sukhna Road—but this one has yet to see the light of day.
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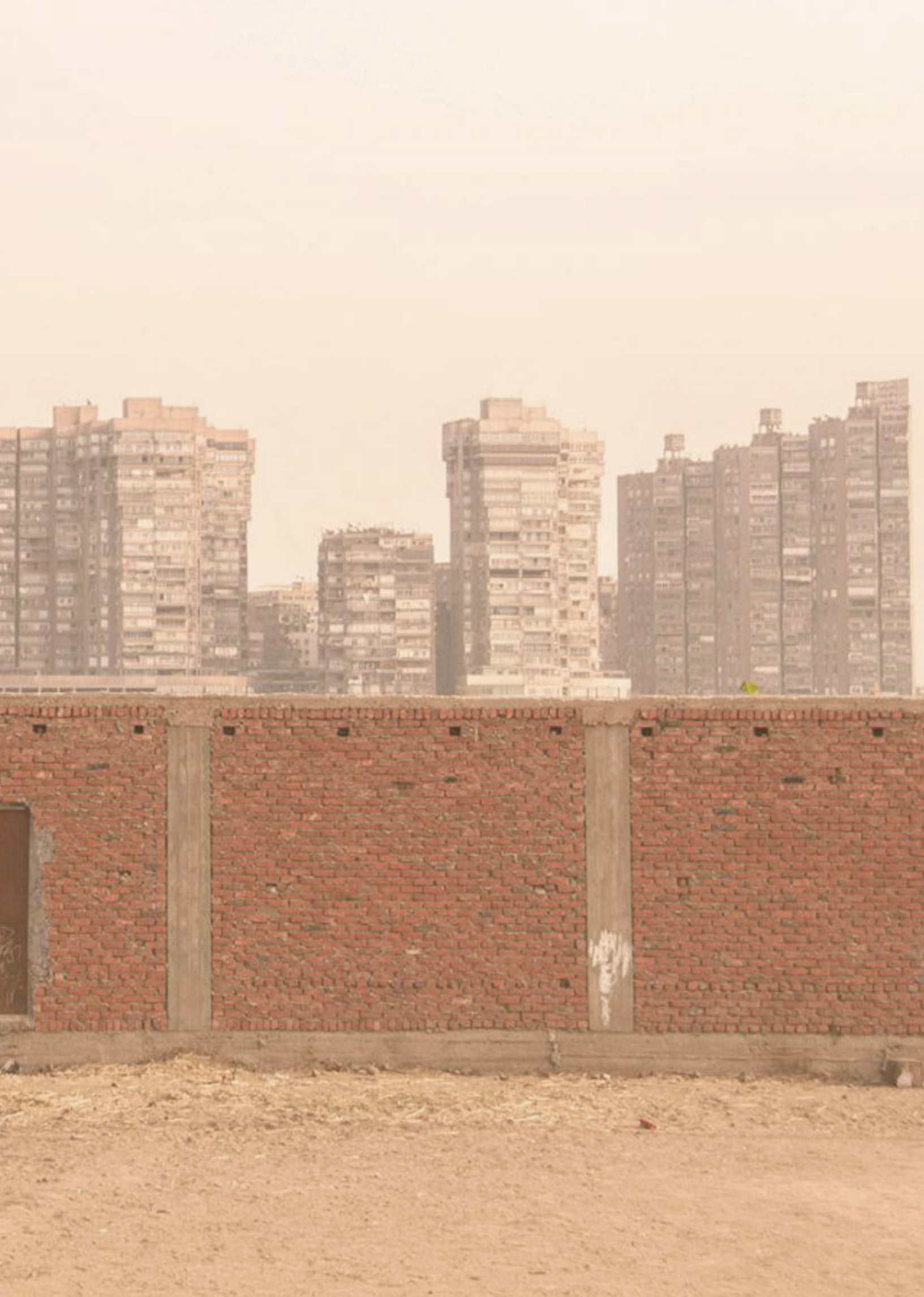


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CHAPTER 2 UNDERSTANDING GREATER CAIRO (1956-PRESENT)

In the late 19th century, the spatial dynamic of Cairo constrained decision-makers to try new solutions to the challenges facing the city and the growth of the population. Heliopolis was the first step in 1905 to find a suitable way out of the desert, ten kilometres from the middle of Cairo. Heliopolis has been a magnet attracting urban development into the empty desert, which separated it from the Capital, yet, the metro line connected both parts of the city. It was successful, from a garden city in the middle of the desert to a metropolitan town close to Cairo.¹

Cairo had already increased government investments in social housing before the early 1960s.² However, the rapid increase in the population (natural growth and rural migration to Cairo) has led to urban expansions in the Capital, as urban settlements such as Nasr City and Mohandessin, built on agricultural lands, and "informal" settlements, like Mansheyat Nasser or Haganah. Under Sadat's rule, Cairo's expansions continued to the degree that new cities were built around the deserts of Cairo to accommodate the fast pace of population growth.³

MASTERPLAN OF 1973

Cairo has experienced several Masterplans in the last period. The first modern Masterplan took place in 1956, where it proposed six industrial sectors to help boost the economy. However, only Hilwan's new settlement in the south and Nasr City in the east took place.⁴

As Cairo was booming and expanding rapidly, the government wanted to set up a new Masterplan for Greater Cairo, including Giza and Qalyubia. The Masterplan took place in 1970 and was approved in 1973, targeting around 16 million inhabitants. Comparing that to the inhabitants in 1990, one notices that the targeted population was very high.⁵

The Masterplan's concept was to construct a ring road around Cairo to limit the city's growth. In other words, it was like a belt to control Cairo. Also, it was the primary connection between Cairo and new proposed satellite cities like the 10th of Ramadan and Ubur in the east, the 6th of October in the west and the 15th of May in the south. It aimed to attract the growing Egyptian population and control the growth of Cairo.⁶

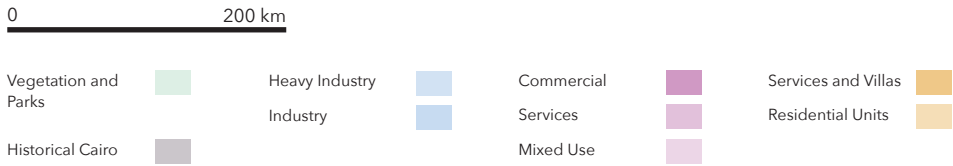
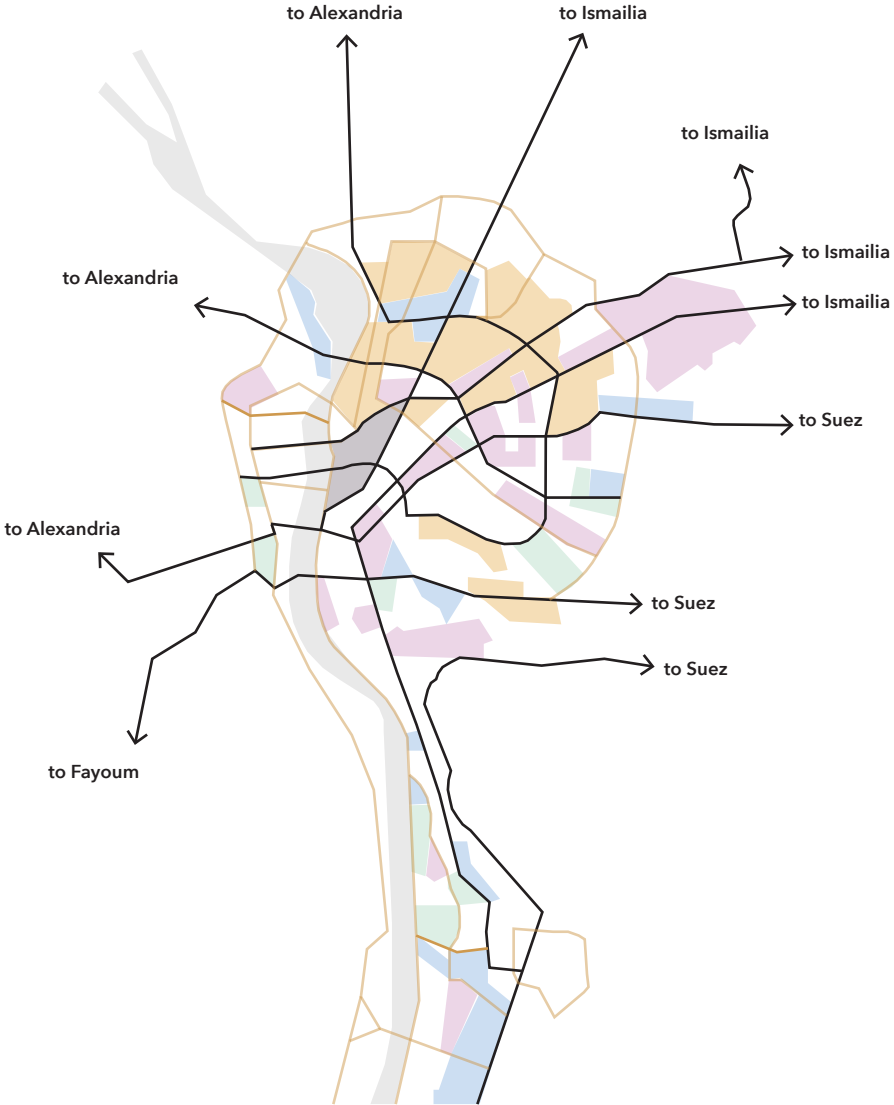


Figure 1 The Master plan of Cairo, 1973. Source: (Volume 2), 2.3 2.3.1 (1) THE STRATEGIC URBAN DEVELOPMENT MASTER PLAN STUDY FOR A SUSTAINABLE DEVELOPMENT OF THE GREATER CAIRO REGION IN THE ARAB REPUBLIC OF EGYPT. Drawing by Author

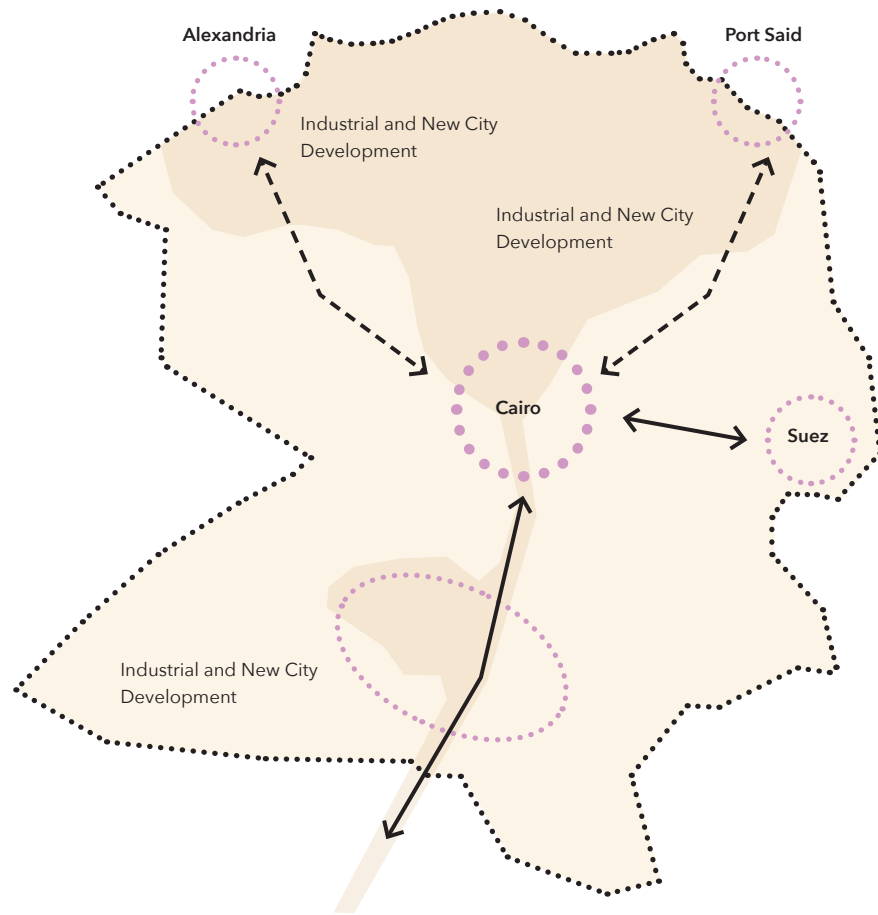
THE MASTERPLAN OF 1982

The next Masterplan was in 1980, made with some French support and the General Authority for Urban Planning (GOPP). The new Masterplan aimed at limiting the growing population of Greater Cairo. The aim was to plan a better urban environment that controls unplanned growth. Also, it allowed the private sector to help the State achieve that aim.⁷

The Masterplan focused on urban connectivity, introducing five Urban Corridors that connect the external cities like Alexandria, Sokhna, Ismailia, Suez and Upper Egypt with Greater Cairo. Urban Corridors still exist, yet in President El-Sisi's time, most of the corridors have been extended and become large in size and capacity (they are still the central axis of the desert cities of today).⁸

Another fundamental theme at the core of the 1982 Masterplan was the "Homogeneous Sector", where every sector in the city is self-sufficient and has diverse programmes. There are 16 "Homogeneous Sectors" in Greater Cairo in the Masterplan; each sector targets a population from half a million to 2 million inhabitants. From the government's point of view, in that way, the State could control the population growth in the city. Also, allow services in the urban environment to take place all over Greater Cairo.⁹

That Masterplan expected the population would keep increasing in the next year. The estimate in 2000 was that Greater Cairo's population would reach nearly 16 million inhabitants. The estimated number of inhabitants that would move to the desert cities at that time was just under one million. Although the Ring-Road infrastructure facilitates the movement on the periphery, it also plans to limit the urban growth outside the city. That plan backfired, and people started to build "informal" settlements on the other side of the Ring Road.¹⁰



Cairo

- National Gateway
- Cultural base
- Tourism base
- Exhibition and Research base for industry
- IT base
- National Administration
- Financial base

Port Said

- Port Transport base

Alexandria

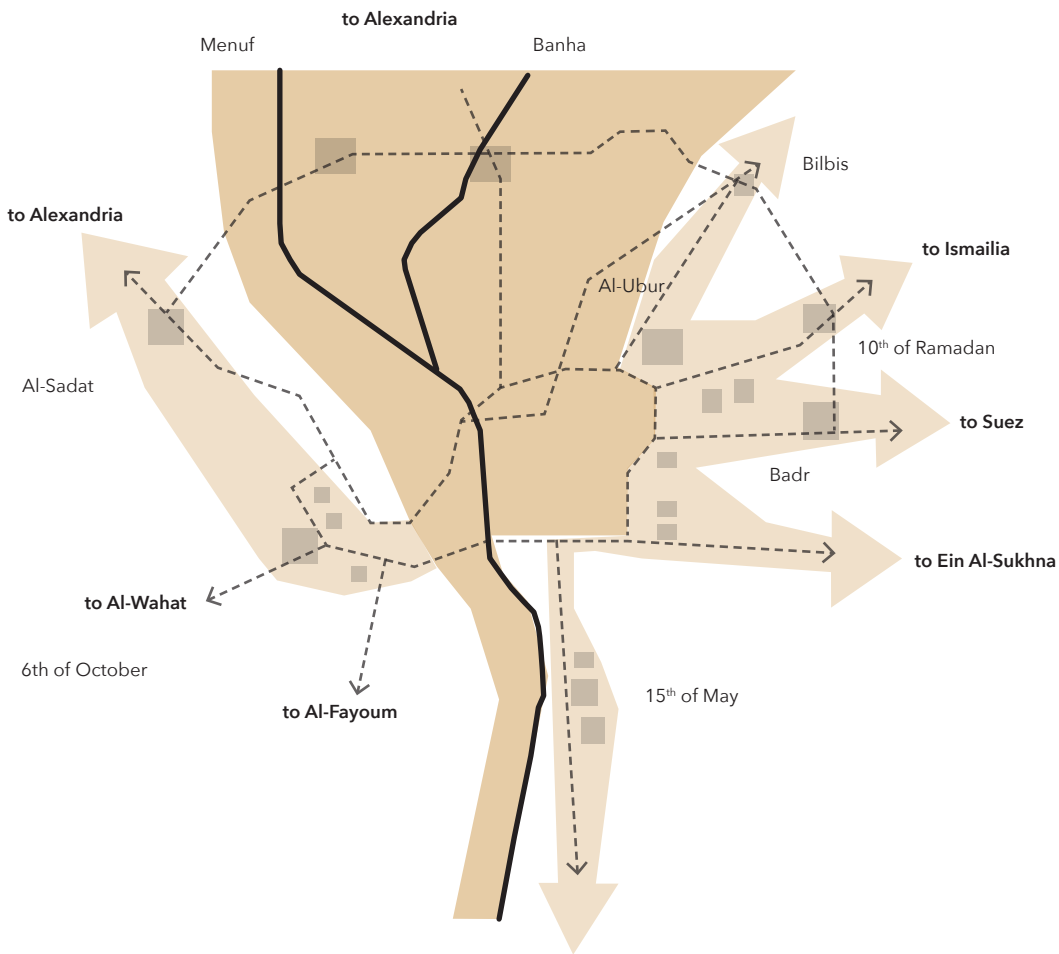
- National Gateway
- Cultural base
- Tourism base
- Port Transport base

Suez

- Port Transport base

0 200 km

Figure 2 The Development Growth Orientation in the North of Egypt. Source: THE STRATEGIC URBAN DEVELOPMENT MASTER PLAN STUDY FOR A SUSTAINABLE DEVELOPMENT OF THE GREATER CAIRO REGION IN THE ARAB REPUBLIC OF EGYPT. Drawing by Author



0 200 km

Figure 3 The corridors in the master plan of Cairo, 1982. Source: (Volume 2), 2.3 2.3.1 (1) THE STRATEGIC URBAN DEVELOPMENT MASTER PLAN STUDY FOR A SUSTAINABLE DEVELOPMENT OF THE GREATER CAIRO REGION IN THE ARAB REPUBLIC OF EGYPT. Drawing by Author

THE REVISED MASTERPLAN OF 1991

The Masterplan for the year 1982 got revised in 1991. That revision was under the supervision of the General Authority for Urban Planning (GOPP) and French support. By this time, the Ring Road already took place, as shown in the Masterplan of 1991. Nevertheless, the Masterplan targeted some changes in land use. The population distribution got updated in the second revision of the year 1992 Masterplan. It targeted four million inhabitants to live in the desert cities around Cairo and 12 million to live inside Cairo (inside the ring road).¹¹

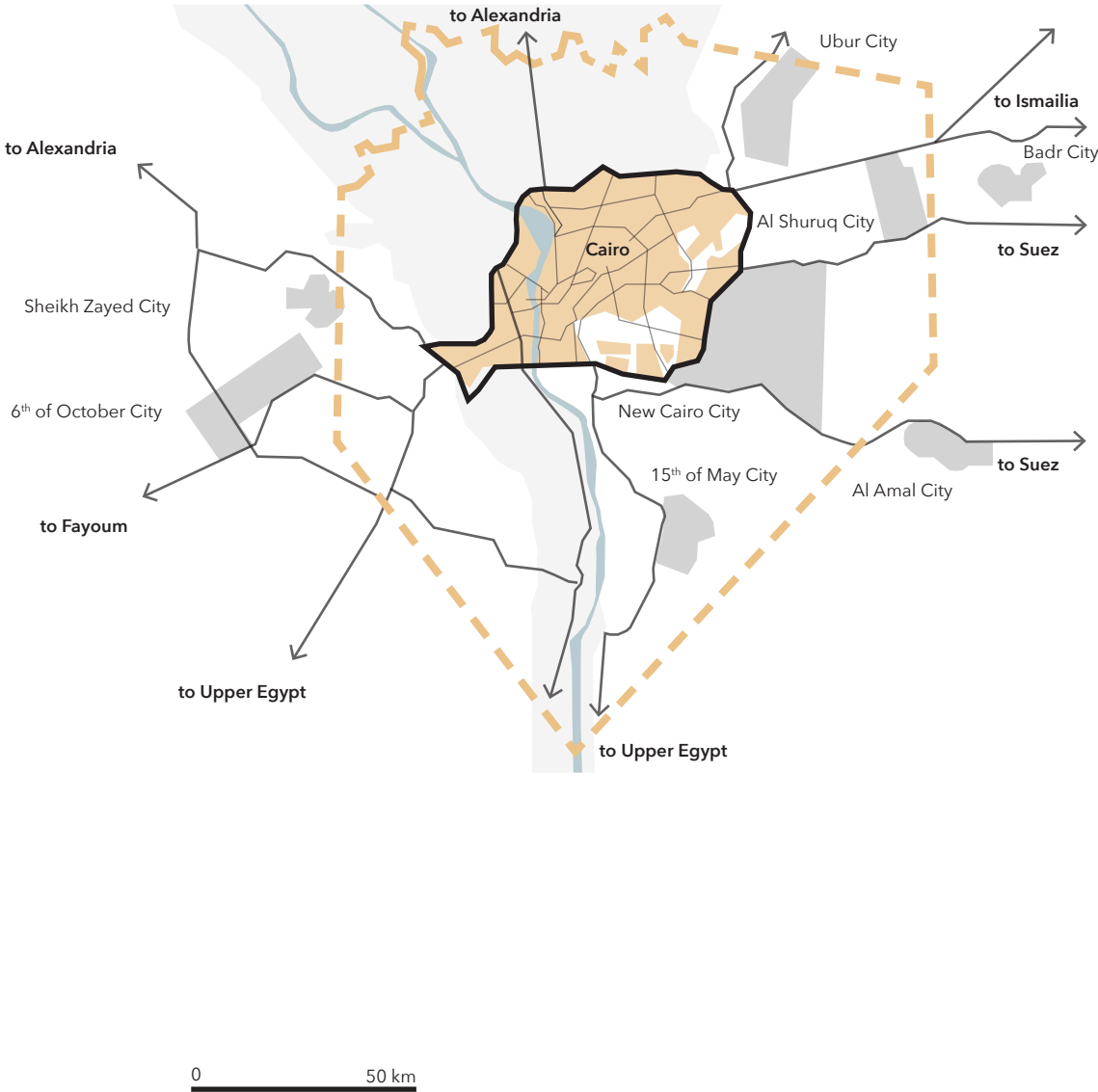


Figure 4 The Masterplan of Cairo, 1991. Source: (Volume 2), 2.3 2.3.1 (1) THE STRATEGIC URBAN DEVELOPMENT MASTER PLAN STUDY FOR A SUSTAINABLE DEVELOPMENT OF THE GREATER CAIRO REGION IN THE ARAB REPUBLIC OF EGYPT. Drawing by Author

THE MASTERPLAN OF 1997

Another revision to the 1982 Masterplan took place in 1997. In 1996, Greater Cairo reached a population of 13 million, and the General Authority for Urban Planning (GOPP) had a new population target of 24 million by 2020. Also, the expectations were that the population in 2000 would reach 16 million inhabitants. Thus in only two decades, the State targeted a population growth of 8 million people.¹²

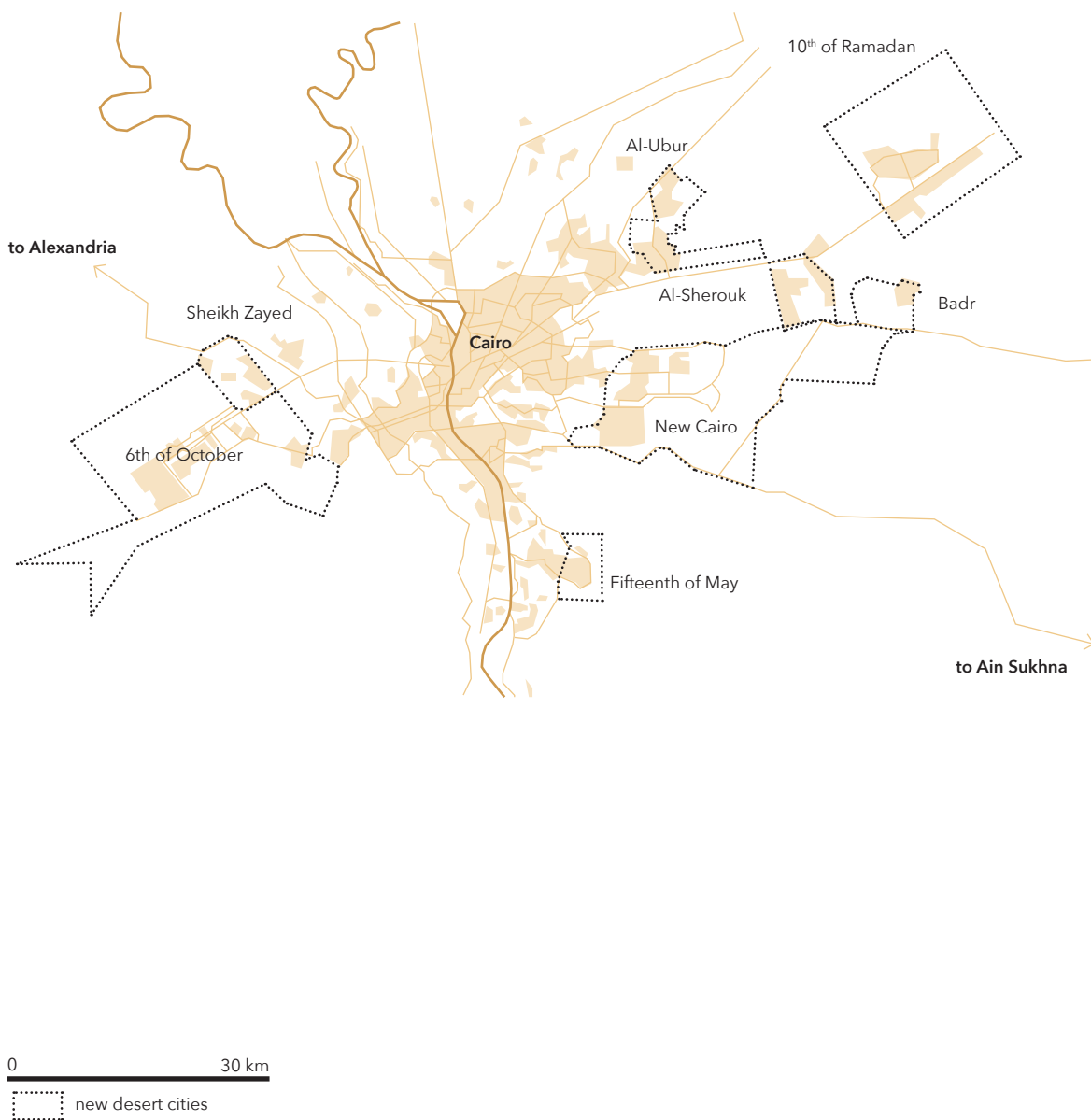


Figure 5 Desert Cities around Cairo in 2021. Drawing by Author

The new Masterplan aimed to attract 5.8 million of the new 8 million in the desert cities. The remaining 2.2 million inhabitants would be in Cairo, inside the Ring Road. After this plan, more and more investments took place in the neighbouring desert cities, and fewer resources got invested in Cairo.¹³

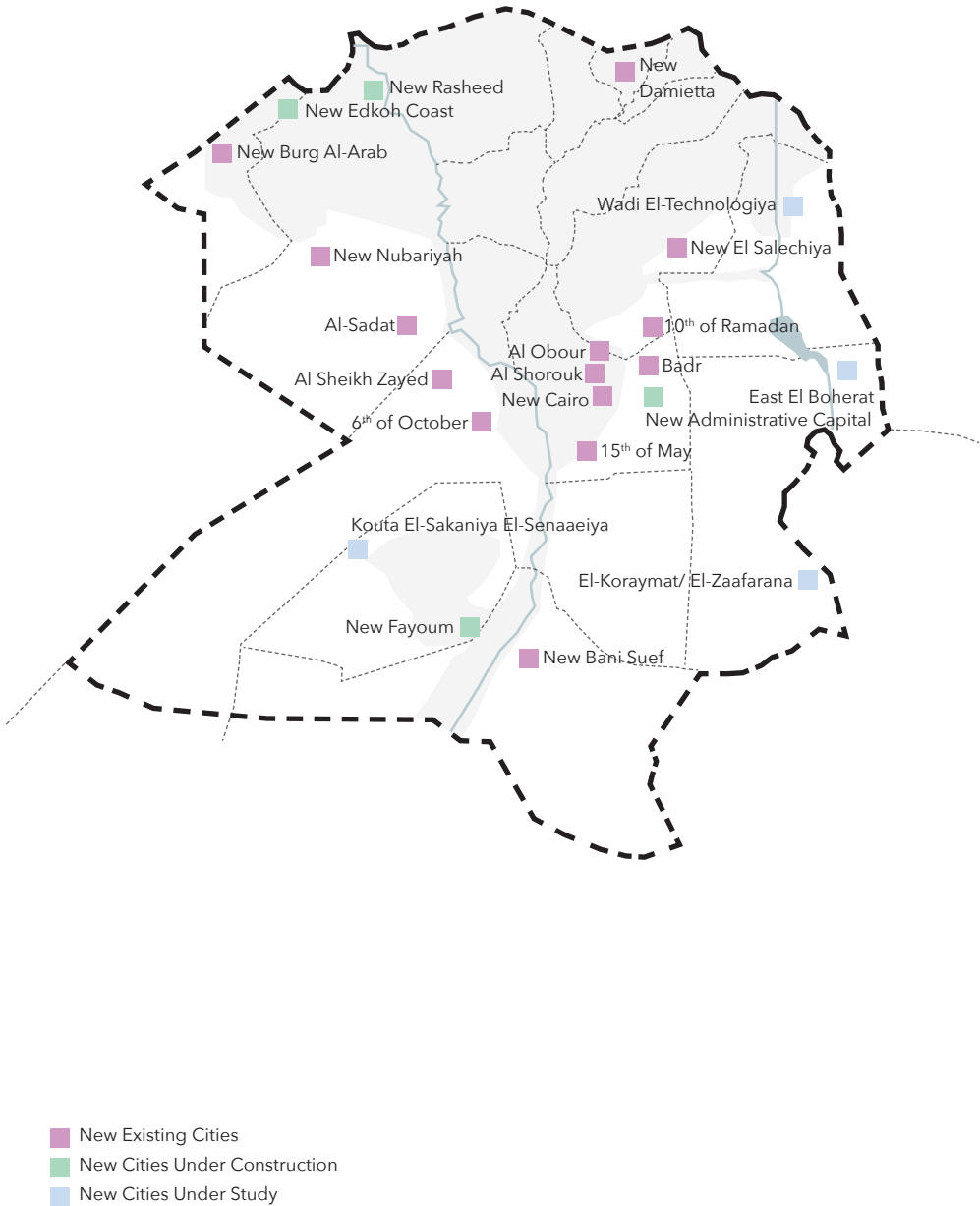


Figure 6 The Existing and Planned New Urban Communities in the North of Egypt. Source: Distribution map of NUCs, NUCA, 2006, Drawing by Author

DECODING CAIRO AND ITS POPULATION

In 1950, large migrations started to come to Cairo from the neighbouring villages and the countryside. Due to the war, all urban and architecture projects were on hold, and Cairo had roughly 2.8 million residents, nearly ten per cent of today's population. The population expanded by over 6 per cent every year.¹⁴

After the war, the city experienced an economic boom where many infrastructures started. Roads, railways, wastewater systems, power grids and bridges took place; the city expanded rapidly. As a result, the Capital had many middle-class groups, high professionals and businesses, and Cairo had all the factors to grow like never before.¹⁵

In the '80s, the population started spilling out of the realm of the city (downtown and the Islamic Cairo). Cairo started to experience two urban expansions, one towards al-Wayli/Heliopolis/Ain Shams and the other towards Shubra/Bar al-Farag. Some satellite neighbourhoods took place, like Maadi and Helwan, yet, over the Nile, the urban development was very limited to Giza and Imbaba. The old centre and Islamic Cairo did not experience urban expansion yet continued attracting poor inhabitants

From 1950, the urban development and expansion in Cairo existed in three categories:

First: is the extension of the Formal City.

Second is raising the "Informal" City to Cairo as a new phenomenon. Another "informal" urban expansion scenario is the "informal" dwellings. It settled on agricultural land (mainly on the city's periphery). That form of urbanism took lots of attention as it threatened food security for many Egyptians. It occurred in the Northern and Western parts of Cairo, in Giza and Qalyubiya. Later, they became parts of Greater Cairo.

Third: urban expansion in the desert started in the late 1970s and absorbed almost all of the State's investments.¹⁶

THE FORMAL CITY AND ITS POPULATION

As strict urban and architectural regulations took place in Cairo in 1940, Cairo's urbanism was almost all Formal till the early 1960s.¹⁷ The building conditions at that time were legal. Also, all architecture projects and land subdivisions respected the building regulations. Most of these building rules and regulations had European backgrounds. As a result, many buildings in Cairo have similar architectural typologies to French and Italian typologies.



■ Cairo 1950: built-up area

Figure 7 Cairo built-up area. Source Seiourne and David Sims in 2009, Drawing by Author

The formal Cairo experienced an urban expansion boost between the 1950s and 1960s, driven by government-subsidised and private real estate projects. On top of these projects was the Mohandiseen-Agouza area in the west. That project was by the Ministry of al-Awqaf (General Authority of Islamic Affairs & Endowments) and created on agricultural land, over 800 hectares.¹⁸ Other projects took place in Cairo, like Muqattam, Hilmiyat al-Zatoun, Helwan and al-Darrasa.¹⁹

From the 1950s, Egypt began its State-subsidised housing programmes that continue in similar forms. The first law for State-subsidized housing was in 1951. Masakin al-Amal in Imbaba was the first State-subsidized project in Cairo, which took place in 1948. It aimed to create housing units for factory workers.²⁰

Many State-subsidised housing projects took place after the revolution in 1952. All the dwellings had walk-up apartments, from two to four floors, like in the industrial areas of Helwan, al-Sharabiya, al-Abbasiya and al-Zawya al-Hamra. After nearly ten years of the revolution, the State constructed around 15,000 public housing units, primarily small (forty-five to sixty-five square meters). These units targeted government employees and limited-income families. These public housing units were affordable housing or Iskan Ektesadi. Later, different categories of public housing joined, with bigger sizes and more facilities, like middle-class housing or Iskan Mutawaset, above-average public housing or Fuk Mutwaset and Luxury or Fakher. Most of these projects targeted military officers and government officials.²¹

All urban and architectural projects stopped during the war in 1967. The economy was not in its heydays when foreign currencies were restricted. Also, materials were limited; labour forces were invested in the military. As a result, Cairo's infrastructure and urban environment lacked maintenance and deteriorated rapidly. That period took longer than expected. Egypt was in wartime from 1967 to 1973, and Camp David peace negotiations took place in 1977, around ten years of austerity; the urban environment was in decline.²²

In the mid-1970s, President Sadat's *infitah*, or Open Entryway arrangement (opening Egypt to the global market and expanding imports), grabbed hold in Egypt, particularly in Cairo. Nearby industrialist business people started to reemerge and invest in Egypt in a short timeframe. The real estate boom started to change Formal Cairo's scene, building controls appeared not to exist, and multiple properties extended a few stories on the existing structures. Infrastructure projects symbolised the 6th of October. Extensions and bridges started to show up. The urban boom continued in the 1980s by presenting the main metro line and many new highways.²³

The unmaintained infrastructure received attention with some foreign help. A new sewerage framework started on the two sides of the Nile, including the world's most significant sewage authority, which keeps running through Port Said Road. Also, enormous power plants and water treatment plants took place.²⁴

Due to the deteriorated conditions of the existing public housing units, the government adopted a "Tamlik" (ownership) policy for both existing and new public housing in 1982, whereby families paid modest monthly instalments and gained ownership of their units after thirty to forty years.²⁵

An architectural boom in State-financed dwellings took place between 1982 and 2005. Almost 50 per cent of all State-financed housing got invested in Greater Cairo in that timeframe. In Cairo, nearly half a million public housing units were done in the same period, almost one-third of all State-financed public dwelling.²⁶ Nevertheless, although all these investments took place, only 5.1 per cent of the inhabitants in Greater Cairo lived in State-financed or subsidised units in 2008.²⁷

The city's demographics over the last period are complex yet, critical. The historical town has experienced a decreased population, especially the old-age inhabitants. According to the census in 1966, six central districts experienced a shrinkage in the number of inhabitants. That number increased again to reach 18 central Districts in 1986. The peak of the exodus from the city centre was between 1986 and 1996, when nearly half a million inhabitants left their neighbourhoods. That is almost 20 per cent of the population in 1986 and took place in old areas like Misr al-Qadima, Bab al-Shaerya, al-Gamalya, al-Darb al-Ahmar and Sayida Zeinab. Also, the downtown district and other districts experienced similar exodus like in al-Wayly, al-Sahel, Rodal-Farag, Qasr al-Nile, Abdin, al-Gamalyia and al-Muski. Some of these districts lost up to 4 per cent of their population yearly. The rate of exodus continued till 2006 but was slower. In ten years, the overall loss of inhabitants in the inner districts reached a quarter a million, nearly 12 per cent of 1996 inhabitants.²⁸

This mass exodus from the city centre and other districts was due to several reasons. Mainly due to the clearances of the "informal" areas by the State. Many "Informal" settlements were in prime locations with a lot of investment potential. Bulaq and Rod al-Farag were some districts that experienced many slums clearances. Another factor that caused the exodus was the expanding real estate market and the commercialisation of the land. Many "informal" districts were on "informal" land, where real estate investors had to remove the old residents. That took place in al-Gamalya, Abdin, al-Dar al-Ahmar and al-Ataba. Another factor for that shrinkage was the decay and collapse of many "informal" settlements in the old town.²⁹

THE INFORMAL CITY AND ITS POPULATION

"Cairo had no informal areas in the 1950s".³⁰ As this notion was not very active in the early days, few journalists and academics have written about it.³¹ The most common scenario was that after President Nasr's nationalisation policies took place, many agricultural lands were taken from the rich and distributed to the poor farmers, who lacked education and managerial experience. Some could not manage their new lands. Also, as most Egyptian villages lacked services, education and healthcare, many decided to sell their land and move to Cairo. Cairo was privileged to have advanced services, good education, a high healthcare system and developed infrastructure. As a result, most farmers moved to Cairo and started to work in modest jobs and built "informally". Several "informal" areas started in Cairo in the early 1960s, where that phenomenon grew like never before.³²

"Informality" started growing in different areas in Cairo (between the 1960s and 1970s).³³ That phenomenon took various forms on agricultural land, extensions on top of formal dwellings and the outskirts of the desert. However, the government's reaction to that

activity was not very effective. Even before "informality" took place, lots of development and subdivision happened on agricultural land without any government reaction (as building on the periphery needs no building permits). As a result, the local administrations had a viable excuse to ignore "informality" on the fringes and agricultural land.³⁴

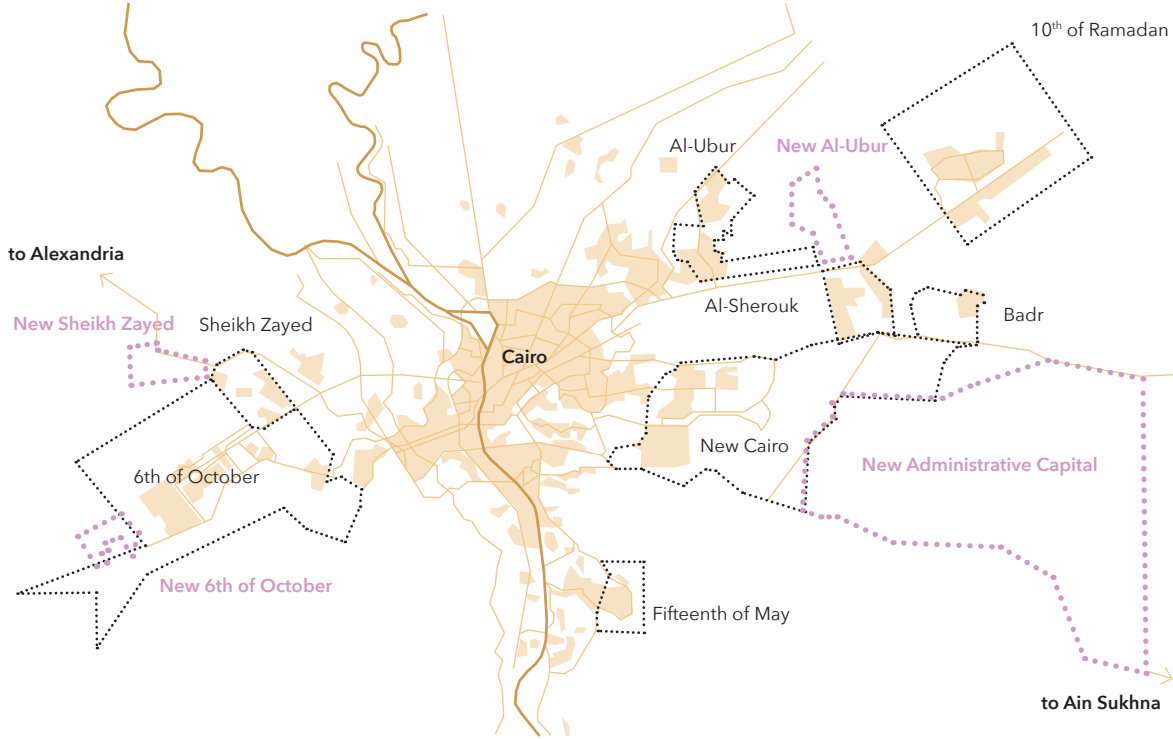
Starting in 1974, financial conditions in Egypt changed significantly because of the consequences of the *infitah* or the open market policies. Also, oil value rose in 1973 (and later 1979). As a result, neighbouring nations like Saudi Arabia, Libya, and Iraq flooded with cash and allowed Egyptians to work in their lands. These Egyptians' income found its way into Egypt and started to make a significant money transfers. Most of this money got invested in building formal and "informal" areas. One can say that this source of income was the catalyst of change in speeding up the "informal" settlements in Egypt.³⁵

Most of these overseas workers returned to Egypt due to the war between Iran and Iraq in the 1980s. That was a factor that slowed the building of new "informal" settlements. By checking the census, in the mid-1970s, the population growth in Greater Cairo started to fall. Before that, it had a growth rate of 3.1 per cent after 1975. Then, the rate went down to 2.7 per cent and continued to fall to 1.9 per cent till 1996. The rate increased later, although the number of internal migrants to Cairo decreased significantly.³⁶

In 1992, "informal" settlements became evident. According to David Sims, the government started to acknowledge that the "informal" settlements were problematic after some radical Islamic groups began to delve into some "informal" areas and expand their influence by creating services the government failed to deliver. That was between the 1980s and early 1990s. The State understood that these areas could be a realm for breeding new fundamentalists and groups destabilising inner security. For example, in the 1990s, the government had to capture the leader of a fundamentalist group, "Prince of Imbaba", in Munira al-Gharbya. Also, the government started to deliver services and fundamental needs that the "informal" settlements' residents needed to counter these groups' control.³⁷

DESERT CITIES AROUND CAIRO

Over the past years, Cairo's deserts were not always empty as many might think. Over the British occupation, the military established several camps in excellent locations. For example, on the Ismailiya Desert road, the Heikastep Camp took place in the 1940s. Also, Cairo's Airport was established in 1950 in Cairo's deserts in the west. After the war in 1967, the Egyptian military established several camps, airbases, factories and defence batteries in the desert to tackle further attacks on Cairo. By the 1970s, the desert was full of military bases and was under military control. That control over the land will play a critical role in further desert developments.³⁸



0 30 km

new desert cities

new desert cities under construction

Figure 8 Desert Cities around Cairo in 2021. Drawing by Author

In Cairo's Masterplan in 1956, it targeted developing satellite desert cities. That was later developed in 1967 Masterplan and got approved in 1974. The aim was to limit the population growth in Cairo to a maximum of 9.5 million inhabitants. So the State introduced four satellite desert cities (the 10th of Ramadan and El-Obour, the 6th of October and the 15th of May) to absorb the excess population.³⁹

The natural development of building Cairo's desert cities comes from the 1974 October Paper from President Sadat. That was an outcome of the successes of the 1973 October war, where President Sadat promoted the economic "infitah" or the open market policies. He also announced the development of the Egyptian new desert cities. The intention was to grow away from the Nile Valley and attract the growing Egyptian population to live away from Cairo. Also, new industries and factories should occur by investing in new cities. That aimed to support the "infitah" policies and help in boosting the Egyptian economy.

Even after thirty years, desert cities are one of the State's main topics regarding physical and demographic planning. President Mubarak confirmed in 1996 in the parliament that the State's interest is to keep investing not only in Cairo's desert cities but also in various desert locations across the country.⁴⁰ After Toshka's land reclamation, President Mubarak said:

*"Leaving the narrow (Nile) valley and fanning out, in a planned and organized manner, throughout the country, has become an unavoidable necessity. Because of these facts, the conquest of the desert is no longer a slogan or dream but a necessity dictated by the spiralling population growth. What is required is not an exodus into the desert but a complete reconsideration of the distribution of population throughout the country."*⁴¹

The idea of imagining new urban communities from scratch in the desert created a movement between members of the State, investors and planners. They all expected uncrowded, clean, modern, representing the new Egypt. Nevertheless, the desert cities were a playground for all decision-makers, planners and government members.

10th of Ramadan was the first desert town, built from scratch with an industrial base between Cairo and Ismailia. It had lots of housing units for the workers. The State commissioned a Swedish firm with supervision from the Ministry of Reconstruction to target half a million population in the Masterplan.⁴³

New towns aimed to attract the working classes by constructing State-subsidised low-cost housing blocks and subdivision plots for middle-class groups. However, after changing many ministers, criticism of the quality of social housing increased. Speed and quantities were the main factors in developing the new desert cities.

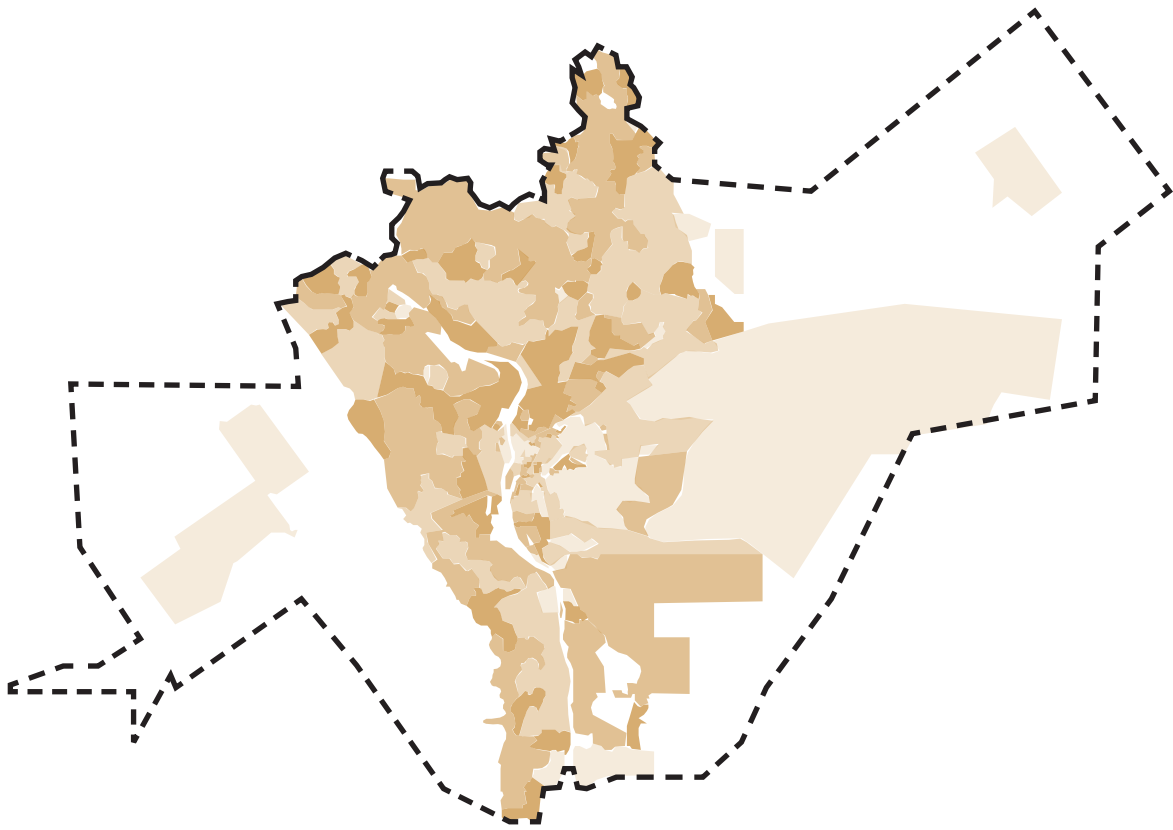
Since boundaries between some of the satellite cities were somehow banal, three second-generation satellite cities formed a larger city called New Cairo City, in the east of Cairo. New Cairo city aimed at attracting two million inhabitants, while Sheikh Zayed city and al-Shuruq city both targeted half a million inhabitants. Also, Badr city started to take place far from Cairo, more towards the Suez Desert Highway.

In the late 1990s, the State started to sell large plots in the desert at a higher price to cover infrastructure and services costs (yet not close to the market prices). As the new urban communities changed some of their policies, they began to bring some new revenues to the NUCA. That was a fundamental shift as the new towns around Cairo started to target middle-class and wealthy communities, with gated communities and high-end housing units. In parallel, the State did not give up on investing in subsidised housing in the new desert towns around Cairo, producing many subsidised housing units.⁴⁴

As a result, real estate investments increased massively in the desert cities around Cairo. Billboards filled the streets with real estate properties, marketing a happy lifestyle, greenery, a clean environment and a new face for modern Egypt. The General Organization for Physical Planning (GOPP) predicted that the population of the new towns around Cairo would reach 1.75 million inhabitants. However, promoters of the desert cities did not accept the population number in the desert cities as it showed only one-third of what was expected/targeted (only around 4 per cent of Greater Cairo's Population).⁴⁵

Bearing in mind the massive investments, resources and activities in new cities such as New Cairo and the 6th of October, low rates of attracted inhabitants were unjustified to the supporters. They doubted the results of the census. Over the eight desert cities around Cairo, the 2006 census confirmed that nearly 409,000 housing units took place. However, most were empty, unfinished or closed. They listed only 139,000 inhabited housing units, which is only 37 per cent of the total housing units in the desert cities. It is a ratio of one to three, which reflects the failure of the projects which sucked most of the total urban investments in the last years.⁴⁶

The population growth in the desert cities around Cairo still seems very slow. Nearly 200,000 subsidised housing units took place in the desert cities around Cairo between 1992 and 2005. The National Housing Program (NHP) targeted half a million new subsidised housing units between 2005 and 2011. Nowadays, large amounts of State-produced dwellings remain empty. Could the State change its methodology toward producing future cities and housing units?⁴⁷



Population Density

- 0 - 100
- 101 - 300
- 301 - 500
- 501 <

Figure 9 The Population distribution in Greater Cairo in 2006. Source: Cences, CAPMAS, 2006, Drawing by Author

GREATER CAIRO THE RELATIONSHIP BETWEEN THE FORMAL, "INFORMAL" AND DESERT CITIES

In 1947, in Greater Cairo, only 2.4 million inhabitants lived in formal Cairo.⁴⁸ On the other hand, over half a million residents lived in peri-urban Cairo, mostly in rural areas, directly or indirectly in the agricultural economy. From 1947 to 1960, Cairo experienced a very high demographic growth, around 4 per cent per year, mainly due to internal migration. As a result, formal Cairo gained 1.5 million inhabitants (the peri-urban areas had almost 400,000 inhabitants). "Informal" Cairo was still practically nonexistent, although there are some theories that nearly 100,000 persons lived in "informalities" at the beginning of 1960. Besides, most of the development in the peri-urban areas was "informal."⁴⁹

Between 1976 and 1986, the expansion of the "informal" city was in its heydays, fueled by massive returns from Egyptians working in Gulf countries. In only ten years, the population of the "informal" city had increased by 1.3 million, nearly half of Cairo's total population. The growth of the "informal" city's population was an incredible 8 per cent per year. In contrast, the formal city did not grow in population terms. It was not that there were no urban projects in the formal city, the Open New Policies generated considerable real-estate investments, but these did not create affordable housing. Moreover, at precisely the same time, the exodus from the inner formal city had peaked, recording an absolute decrease of over 600,000 persons, 20 per cent of the population. Where did these people go? Most moved out to the periphery to live in the "informal" city. Some also moved to large public-housing projects such as Madinat al-Salam, and others moved farther into peri-urban villages.⁵⁰

Year	Formal Cairo	Informal Cairo	Peri-urban Cairo (mostly Informal)	Desert Cairo	Total Greater Cairo Region (GCR)	GCR Annual Increase %	Per cent Informal in Cairo Proper	Per cent Informal in GCR
1947	2.400.242	0	586.038	0	2.986.280	-	0,00	10,20
1960	3.905.670	100.000	955.166	0	4.960.836	3,98	2,50	15,60
1976	4.610.326	1.969.000	1.374.317	0	7.953.643	2,99	29,90	38,10
1986	4.650.000	4.248.866	2.063.376	32.615	10.994.857	3,29	47,70	54,50
1996	4.807.632	5.435.477	2.857.468	149.992	13.251.569	1,88	53,10	59,70
2006	5.005.824	6.742.416	3.942.262	601.767	16.292.269	2,09	57,40	62,80
2009	5.038.763	7.155.106	4.345.567	800.952	17.340.388	2,09	58,70	63,60

Table 10 The Population of Greater Cairo between 1947 and 2009. Source: Census of Egypt. Table by Author

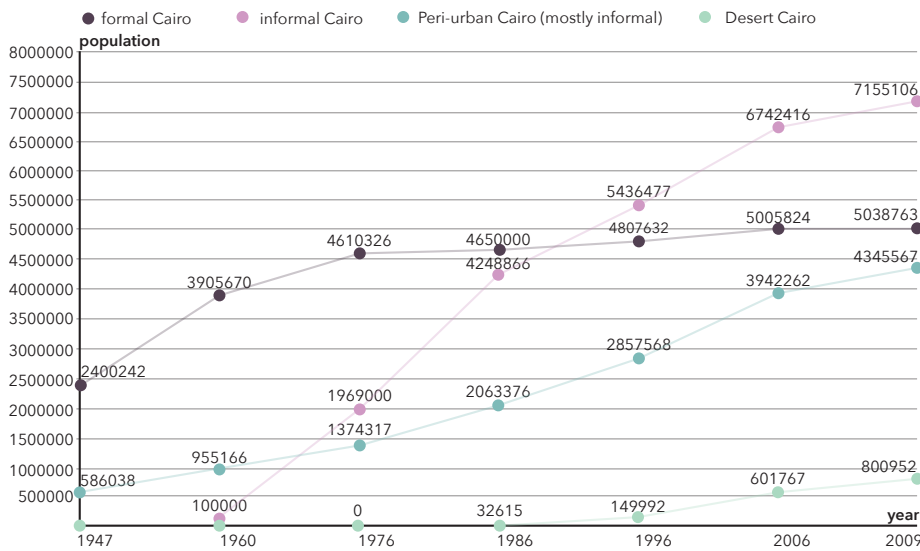


Figure 11 The Population growth in Greater Cairo between 1947 and 2009. (X Axis: Year, Y Axis: Population).
Source: Census of Egypt. Graph by Author.

By looking at Figure 10 and Figure 11, for forty-six years, the "informal" town was in its heydays from 1960. The "informal" city attracted nearly seven million inhabitants in a short period. When adding the population in 2009 of the "informal" city and the peri-urban city (which is also "informal"), the speed of the "informal" was faster than the formal city. The sum of the "informal" is twice as much as the Formal. As for the desert cities, they only attracted 600,000 inhabitants over the same forty-six years.

As the population is increasing fast, what would happen to Greater Cairo in the future? The GOPP and a consultant from Japan predict that the population growth in the Capital will continue to grow till 2027. They predicted that Greater Cairo will exceed 24.2 million in 2027. Although that information is from 2006, they have articulated one of Greater Cairo's critical problems. Could a city keep growing forever? Moreover, what are the consequences of that uncontrolled growth? According to the Census Info Egypt, in 2020, the population in Cairo reached 25 million residents, in addition to three million daily visitors from the neighbouring villages.⁵¹

One can say that the majority of Greater Cairo is "informal" in the housing market and other topics like economy and transportation. Given these statistics, should the State react to the "informal" as a problem or as part of the solution? Could the "informal" initiatives help solve Egypt's epidemic problem of limited resources and booming population? Could we design better cities and typologies that respond to the real needs of people?

- 1** Mahmoud, R. A., (2010), Heliopolis: The metamorphosis of a garden city into an urban district, EUE Les Editions Universitaires Européennes, Berlin, 240 P.(Book in French)
- 2** Rashed, R., (2014), Emergent Trends in Architecture and Urbanism in Modern Cairo: Shifts in the Built Environment, World SB14 Barcelona, 7 P.
- 3** Mahmoud, Randa. (2016). New Cairo's Urban Paradox: All-Inclusive Urbanism vs. Social Exclusion
- 4** (Volume 2), 2.3 2.3.1 (1) THE STRATEGIC URBAN DEVELOPMENT MASTER PLAN STUDY FOR A SUSTAINABLE DEVELOPMENT OF THE GREATER CAIRO REGION IN THE ARAB REPUBLIC OF EGYPT.
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- 14** The annual rate of population increase in Cairo was reported to be an amazing 6.4 percent per year in 1945 (Nippon Koei Co. Ltd. and Katahira Engineers International, Strategic Urban Development, 2-32).
- 15** David Sims, Understanding Cairo, The Logic Of A City Out Of Control, page:45
- 16** David Sims, Understanding Cairo, The Logic Of A City Out Of Control, page:46

17 In particular, Laws 51 and 52 of 1940. Most subdivision development up to this time was undertaken by private companies, many of which were under non-native management and all of which employed European professionals or Egyptians with European training backgrounds, and adherence to regulations was near-universal. It had yet to be discovered that enforcement was a relative concept.

18 The Mohandiseen scheme reveals a number of misconceptions and ironies. The project was conceived in 1944, thus predating the 1952 revolution by a long shot. The plans foresaw the complete disappearance of the traditional villages found in the area, such as Mit Vqba and Agouza, but these clusters are still there sixty years later and are doing very well. It is ironic that some of those professionals and urban elites who bemoan the loss of agricultural land around Cairo due to informal urbanization live or work in Mohandiseen, itself built entirely on very productive agricultural land. It is amusing, seeing the area today with its huge apartment towers, to recall that the original tanzim plans specified a maximum building height of only ten meters, or three floors, for all of the scheme except the main boulevards (Volait, *Architectes et Architectures*, 344--45).

19 Abu-Lughod, *Cairo: 1001 Years*, 179.

20 For details on the Masakin al-Vmmal project in Imbaba, see Volait, *Architectes et Architectures*, 338-41. Today the area is a pleasant, quiet, and tree-shaded neighborhood, with most of the original structures having been altered and building heights increased dramatically through individual initiatives. It is ironic that this 'town house' form of public housing, which allowed residents to expand and improve their units as circumstances permitted and thus is extremely suitable to the Egyptian urban family, has never been repeated in any of the hundreds of subsequent public housing projects scattered throughout Cairo and indeed Egypt.

21 Three luxury public housing blocks were built in the mid-1960s in al-'Abbasiya and intended for ranking army officers, but following Egypt's defeat in the 1967 war these buildings were turned into government offices.

22 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*, page:51

23 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

24 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

25 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

26 United States Agency for International Development (USAID), *Review of Egyptian Subsidized Housing Programs*, Annex B.

27 United States Agency for International Development (USAID), *Housing Study for Greater Cairo*, 25. This figure may be on the low side, since older respondents in the survey may have inherited or been gifted government units. For comparison, over the 2003-2008 period a total of 10.3 percent of households in Greater Cairo moved into units that were government-built (pages 38-39). In peri-urban Greater Cairo, this figure falls to 1.1 percent. (United States Agency for International Development (USAID), *Housing Study for Peri-urban Areas*, 25.)

28 The population of upscale Zamalek, which had recorded small losses from 1966

through 1996, registered a slight upturn in the 1996-2006 period, and its 2006 population was enumerated at 16,900 inhabitants.

29 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

30 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

31 Abu-Lughod, Cairo. Her book was not published until 1971. It included a postscript based on rapid revisits to Cairo in 1968 and 1969, but even at this late date, she observed only small informal developments in al-Basatin and Dar al-Salam.

32 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*, page: 59

33 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*, page: 62

34 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*, page: 62

35 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

36 For an early commentary on the decrease of migration to Cairo, see Shorter, „Cairo’s Great Leap Forward.“

37 For a description of the insertion of services as well as bureaucratic control into al-Munira al-Gharbiya, and the resulting political changes and alliances, see Haenni, „Cousins, Neighbors, and Citizens,“ 309-29.

38 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*, page: 73

39 Dorman, „Politics of Neglect,“ 87. The 1969 Master Plan also called for the construction of a ring road that would create a physical barrier and prevent further city expansion on agricultural land.

40 Madbouli, „Background Paper on Urban Planning,“ 59.

41 Reported in *Al-Abram Weekly*, 14-20 November 1997, 2.

42 According to gossip at the time, the site of Tenth of Ramadan was chosen personally by Sadat. He was in his helicopter flying over the Ismailiya Desert Road, and at a certain point he was said to have pounded the floor with his walking stick, and his accompanying ministers had to try to figure out just where this act should be pinpointed.

43 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

44 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

45 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

46 There are a number of micro studies and reports that confirm the shockingly high level of housing vacancies within Cairo’s new towns. A study in 2006 sampled different kinds of housing in New Cairo and found that vacancy rates were 60 percent for subsidized government youth housing, 68 percent for resettlement public housing, 60 percent for the Qattamiya Heights gated community, and 100 percent for private residential blocks. And it should be pointed out that the areas of New Cairo sampled were the more mature, western neighborhoods. In Sheikh Zayed gated communities, the same study reported a vacancy rate of 53 percent. (Fahmi and Sutton, „Greater Cairo’s Housing Crisis,“ 277-97.). Very high vacancies were also reported for public housing projects in Cairo’s new towns in United States Agency for International Development (USAID), *Review of Egyptian Subsidized Housing Programs*, Annex B. Various investigative articles appear in the local press about ghost cities from time to time. See for example „Min yaqul inn fi azmat al-iskan?“

47 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

48 In 1947 the Census of Egypt reported 2.1 million inhabitants for Cairo governorate (then mudiriya), 268,000 for Giza qism and Imbaba, and 41,000 for „Cairo suburbs“ in Qalyubiya. See *Century Census Egypt 1882-1996*, Cairo Governorate section, year 1947.

49 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*

50 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*, page:51

51 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*, page:51





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مبنى الخدمات المجتمعية













CHAPTER 3 THE DESERTED CITIES AROUND CAIRO POPULATION-INCREASE AND THE URBAN GROWTH

The Population growth in Egypt is one of the fastest in the world. It increases by 3 million inhabitants annually, so it is no surprise that the current population will double only in 30 years. Under these statistics, there is no chance for Egypt to turn its back on the idea of planning new cities and introducing a sustainable way of modern transport.¹

For the last few years, the population has been increasing at a very high rate, and the State has failed to build attractive new cities and dwellings to host the new citizens. As a result, Cairo and Alexandria became two huge centralised metropolises with millions of citizens and vast "informal" settlements.

*"Egypt is not like European countries where many cities have grown organically over a long period," "Here, you only have Alexandria and Cairo. They have a massively growing population and only two cities. They have to build new ones."*² Horner (Director at Dar Group). On the other hand, David Sims, the author of Egypt's Desert Dreams: Development or Disaster? says that the government *"is counting on a never-ending demand for land" from private developers. "My fear is that demand might be too thin, given the huge and growing market supply."*³

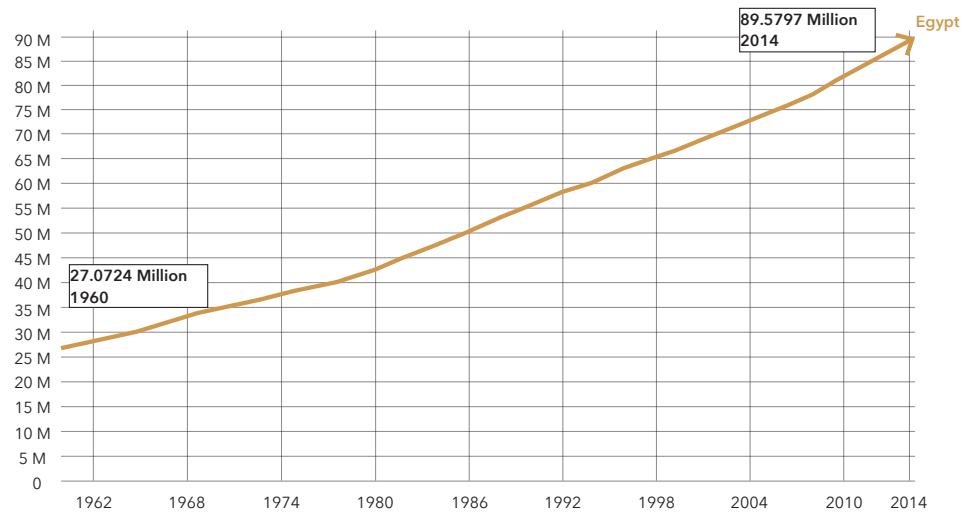


Figure 1 The population of Egypt. Source: World Bank Database. Modified by Author

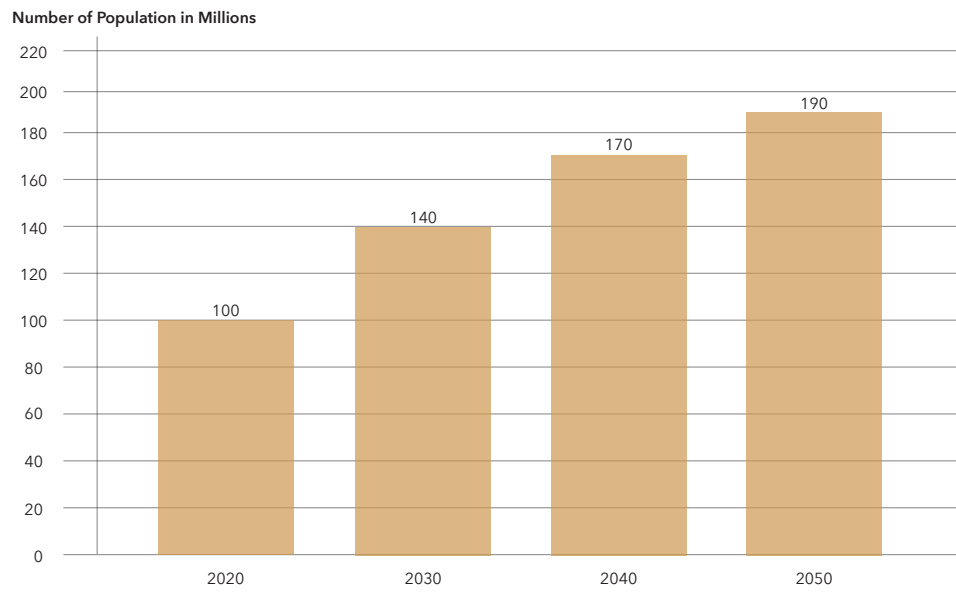


Figure 2 The Expected Population Growth in the next 30 years. Source: NUCA. Graph by Author



- Populated Places
- 1,000,000 - 6,325,000
 - 300,000 - 1,000,000
 - 200,000 - 300,000

Persons per square kilometer

0	10	100	1000	5000 and above
0	26	259	2590	12950 and above

persons per square mile

based on 1986 census data, by first-level administrative division.

For comparison, the population density for the Washington, DC metropolitan area is 920 persons per square mile.

Figure 3 The largest cities and population densities of Egypt in 1986. Source: Atlas of the Middle East (1993), U.S. Central Intelligence Agency, available on the website of The University of Texas at Austin Libraries, Drawing by Author

After many years of neglecting the population increase, the government has noticed that it is faster than State's development process. In the last 40 years, many generations were raised in precarious conditions and found no future working on their parents' farms. As a result, many decided to move to Cairo with their modest educational background and find a job and affordable housing. Therefore, internal migration boosted the number of "informal" settlements in Cairo and Alexandria.

GREATER CAIRO'S NEW CITIES

The new cities programme remained the primary catalyst for formal urban development in Egypt for four decades. As a result, almost 22 new built towns and proposals for 19-24 more by the New Urban Communities Authority (NUCA). That is potentially the world's most ambitious modern cities programme ever—a vision of new cities in the middle of the desert—these new towns house around seven million residents.⁴

Desert City	Construction Year	Census Population 1986	Census Population 1996	Census Population 2006	Census Population 2014	GOPP Population Estimate 2005	2005 Census Va. Of Housing Units	2006 Census % of Housing Units Vacant	Area of New Town as of 2009
10th of Ramadan	1977	8.509	47.833	124.120	430.000	500.000	n.a.	n.a.	208 km ²
15th of May	1978	24.106	65.560	90.324	200.000	180.000	36.434	35.1	16 km ²
6th of October	1981	528	35.354	157.135	1.350.000	500.000	142.244	62.8	413 km ²
Badr	1982	-	248	17.172	85.000	60.000	21.381	71.1	52 km ²
Al-Ubur	1988	-	997	43.802	300.000	100.000	40.261	64.4	54 km ²
Al-Shuruq	1955	-	-	20.983	170.000	62.000	27.764	79.2	42 km ²
Sheikh Zayed	1995	-	-	29.553	233.000	48.000	32.876	68.6	38 km ²
New Cairo	2000	-	-	118.678	1.200.000	302.000	108.220	64.1	351 km ²
New Administrative Capital	2015	-	-	-	-	-	-	-	688 km ²
Total Desert Cities	-	33.143	149.992	601.767	2.768.000	1.752.000	409.180	62.8	1.862 km ²
Total Greater Cairo	-	10994000	13231000	16292000	22000000	16200000	7369128	-	-
% of GC Population in Desert Cities	-	0.3	1.1	3.7	13	10.8	-	-	-

Table 4 The relation between the targeted population and the real population. Sources: Arab Republic of Egypt. Al-Jihaz al-Markazi lil-Ta'bi'a al-'Amma wal-Ihsa'. Al-Ta'dad al'am lil-Sukkan wal-iskan wal-munsa'at (Census of Egypt) various years; for areas of new town concessions, calculated from GOPP and Google Earth. By: David Sims.) Modified by Author

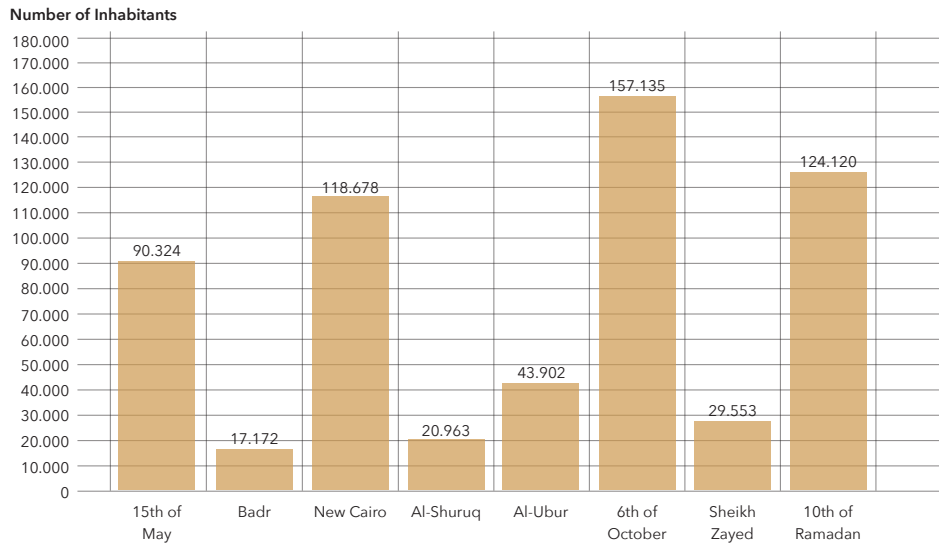


Figure 5 Residents in the Desert Cities around Cairo (Year 2006). Source: Census of Egypt, 2006. Graph by Author

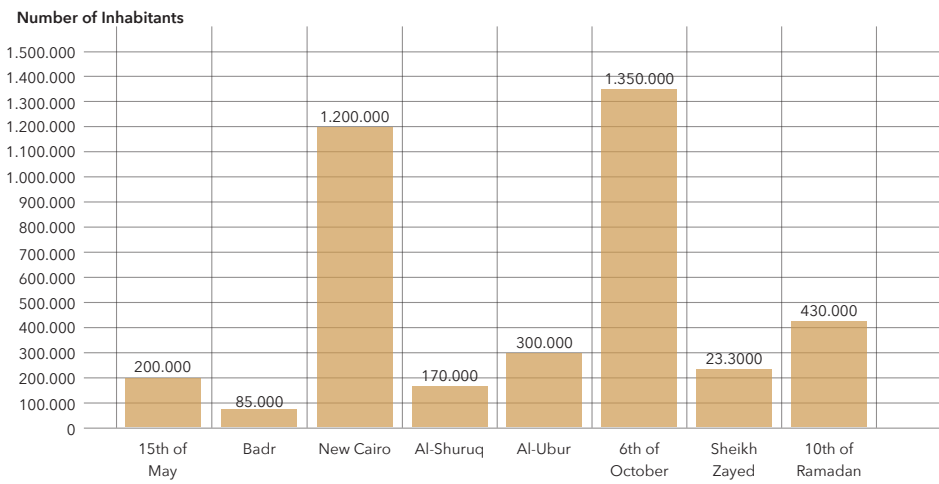


Figure 6 Residents in the Desert Cities around Cairo (Year 2014). Source: NUCA 2014. Graph by Author

When comparing Figures (5) and (6) with Table (4), one can notice that all desert cities did not reach a fraction of their targeted population. Only New Cairo City and the 6th of October City succeeded in attracting more inhabitants than the rest. Those statistics represent the State's failure over the last forty years in achieving its urbanism role.

Advertisements of new villas, compounds and flats have concurred the billboards across Greater Cairo. Sodic Realestate company has scattered compounds around Cairo, like East Gate, West Gate and Beverly Hills. Tallat Mostafa Group (TMG) constructed large compounds almost as big as other European cities, like Madinaty and al-Rehab. Other small firms invest in smaller-scale projects, offering gated communities and a luxurious lifestyle. These investments promote a healthy life and a clean, unpolluted, green, safe and calm lifestyle. In other words, it is living in a bubble avoiding Cairo's lifestyle.

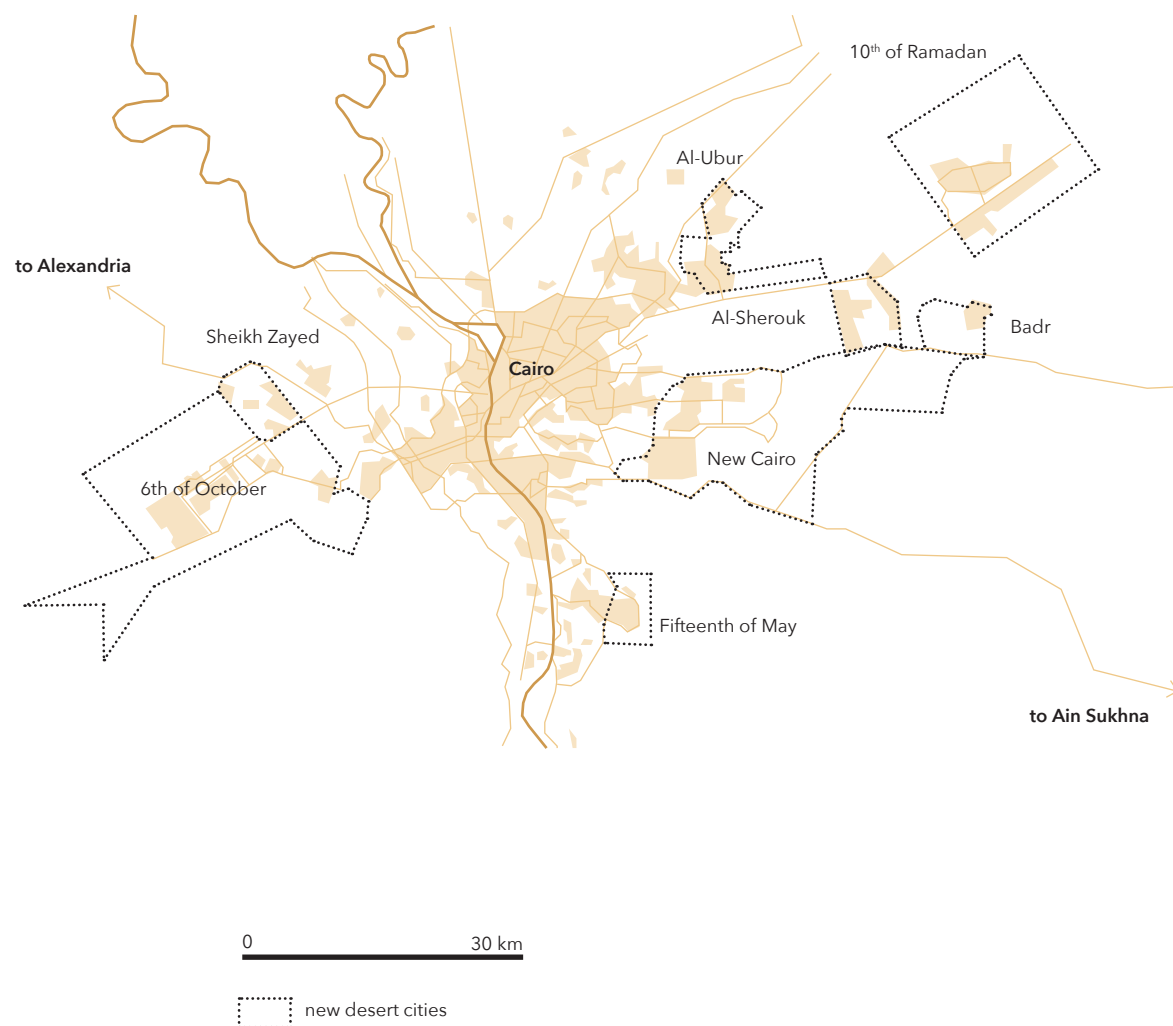


Figure 7 Desert Cities around Cairo in 2011. Drawing by Author

Most of these private cities/compounds offer the following: private schools, private universities, private hospitals, private nurseries, shopping centres, private sports clubs, golf fields, luxury hotels, car showrooms, business parks and green parks. Parallel to these investments, there are vast subsidised State-financed housing units all over Greater Cairo. According to David Sims, these urban activities in Cairo's desert cities were part of "a new hybrid globalised Americano-Mediterranean lifestyle" and are "completely in tune with the parameters of economic liberalisation and IMF-driven structural adjustment."⁵

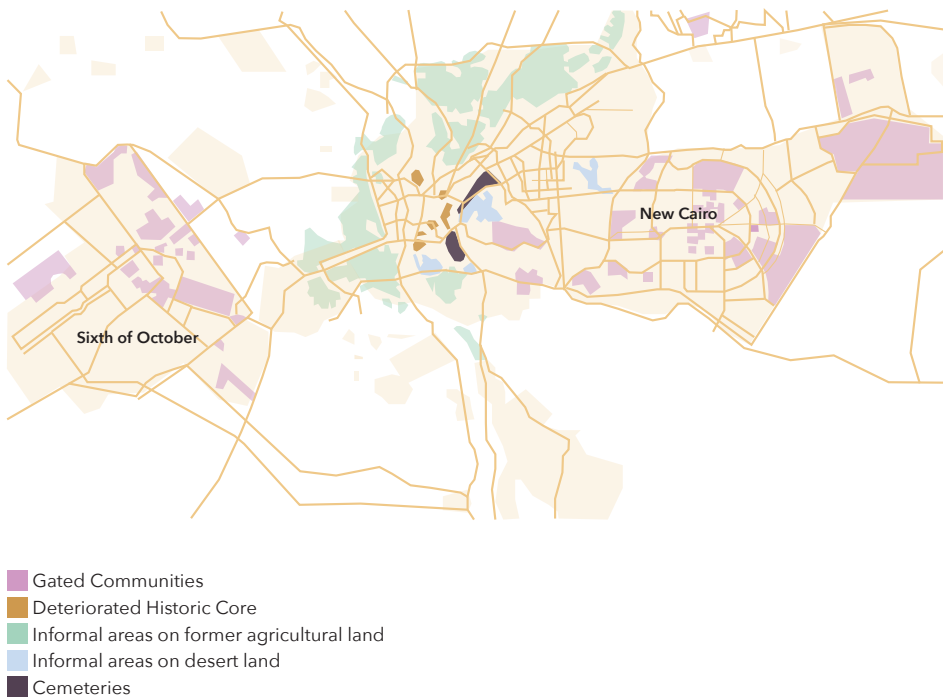


Figure 8 Gated Communities across Greater Cairo. Source: Failed Architecture, by Abdelbasheer Mohamed, Drawing by Author

Till the year 2011, there were eight new desert cities around Cairo. They have succeeded only in attracting around 610,000 inhabitants over forty years. That is only four per cent of Greater Cairo's population.⁶ Nevertheless, these 610,000 inhabitants represent more than 80 per cent of the population attracted to new cities across the country. It would be accurate to say that these figures represent the State's main national housing programme.

Under President al-Sisi, the State started constructing several fourth-generation cities, yet, the majority were spread all over Egypt. The New Administrative Capital and three other towns are under construction as New the 6th of October City, New al-Ubur City and New Sheikh Zayed City. Building new cities is a nationwide programme; more than twenty new cities are under construction. However, most of the investments from 1977 to nowadays are

taking place around the desert cities around Greater Cairo. These projects have attracted the private real estate market since it was the only game in town, with some State pressure to achieve a faster urbanisation rate and attract inhabitants as soon as possible. On top of these megaprojects is the New Administrative Capital.

The urban typologies of the first eight desert cities are more or less similar. Masterplans are designed on a large scale, with wide streets, boundaries between the zonings, low density and mono functionality of programmes.⁷ As a result, there are many vacant housing units in every desert city around Cairo. Each residential area has a low density of inhabitants, under fifty to seventy residents per hectare. That is achieved by allowing nearly 60 per cent of the land for open spaces, green areas and wide roads. In all State-built housing dwellings, lots of parking areas separate the residential buildings. Also, private compounds have large green areas, golf courses and generous gaps between the residential units to create low densities.⁸

This urban planning and separation of urban programmes might fit American culture and other countries. However, in Egypt, the culture is based on integrating activities, mixed uses, diversity of programmes and density. Also, with Egypt's harsh desert conditions, density is a critical factor that counters high temperatures. While large open spaces and green areas might seem ideal in many countries, here is another case, as water is scarce in Egypt.⁹

Four cities had industrial bases from the first eight desert cities: the 10th of Ramadan City, the 6th of October City, Badr City and al-Ubur. As a result, industrial investments, factoring and manufacturing hubs took place. The State has successfully achieved that by allowing investors to have subsidised land, ten years of no taxes and easy permissions. Also, all foreign investors were only allowed to locate in the desert cities, boosting the industrial succession of these towns.¹⁰ As a result, there are over 1,500 factories in Cairo's desert cities, with more than 200,000 of the labour force.¹¹

Although these desert cities succeeded in attracting Egyptian and foreign investors and many factories, the concept of attracting new residents to the new towns did not succeed. The new labour force was the first targeted group, and the State hoped that workers would bring their families. Unfortunately, that was not the case; most workers still commute from their towns daily. Buses and minibuses transport the working-class daily from Cairo, Qalubia, Giza, Sharqeya and Ismailiya. Although the manufacturing industry is considered successful in Cairo's desert, many factories are closed or do not with a total capacity in service.¹²

The investments in planning and building the desert cities around Egypt were mainly government investments. Therefore, most of these investments were financed from taxpayers' money, and few urban investments were privately developed. As a result, billions of dollars have been invested in the desert over fifty years with very little success. Only the fourth-generation cities started to have a different financial model, where technical infrastructure and social housing were financed through the revenue of selling the land to investors and the private sector. Therefore, urban developments are no longer financed by the taxpayers, and these resources could be invested in other sectors. Only in the New Administrative Capital the business district is financed by a Chinese loan. However, it is unclear how the State plans to repay the loan in the coming years.

1. TENTH OF RAMADAN NEW TOWN

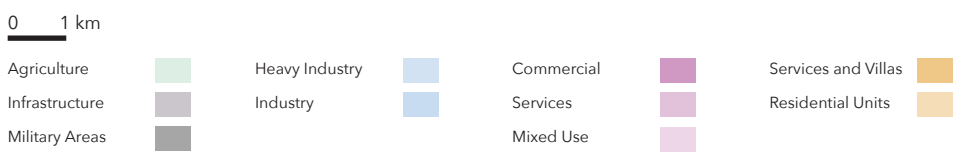
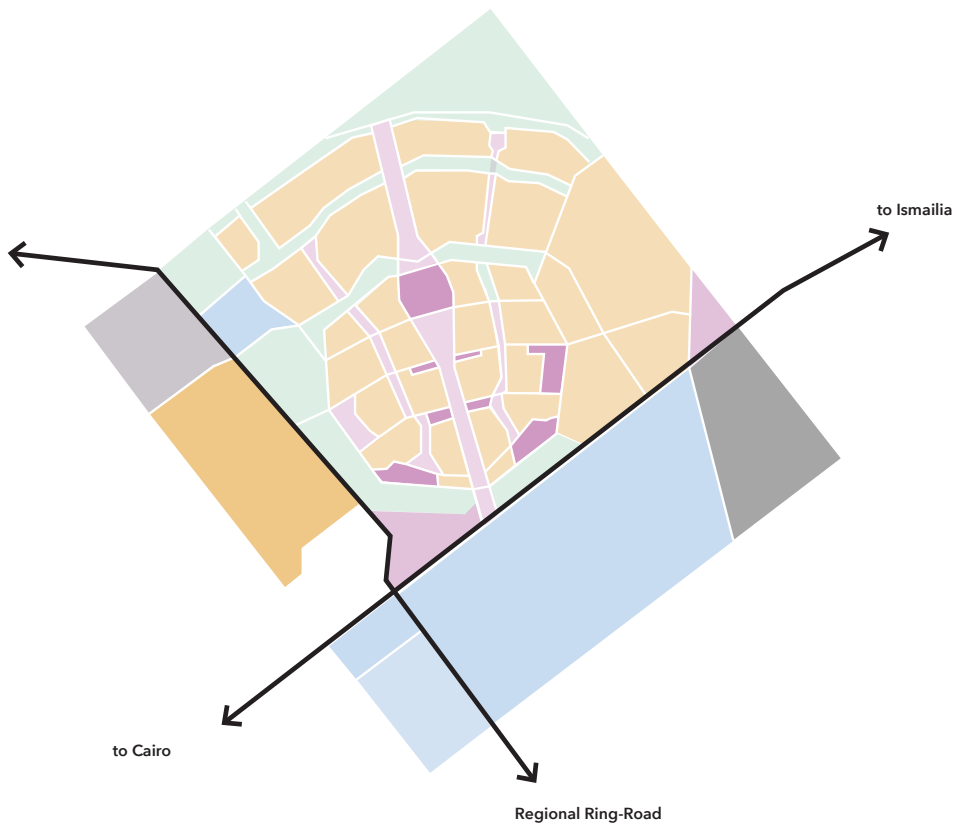
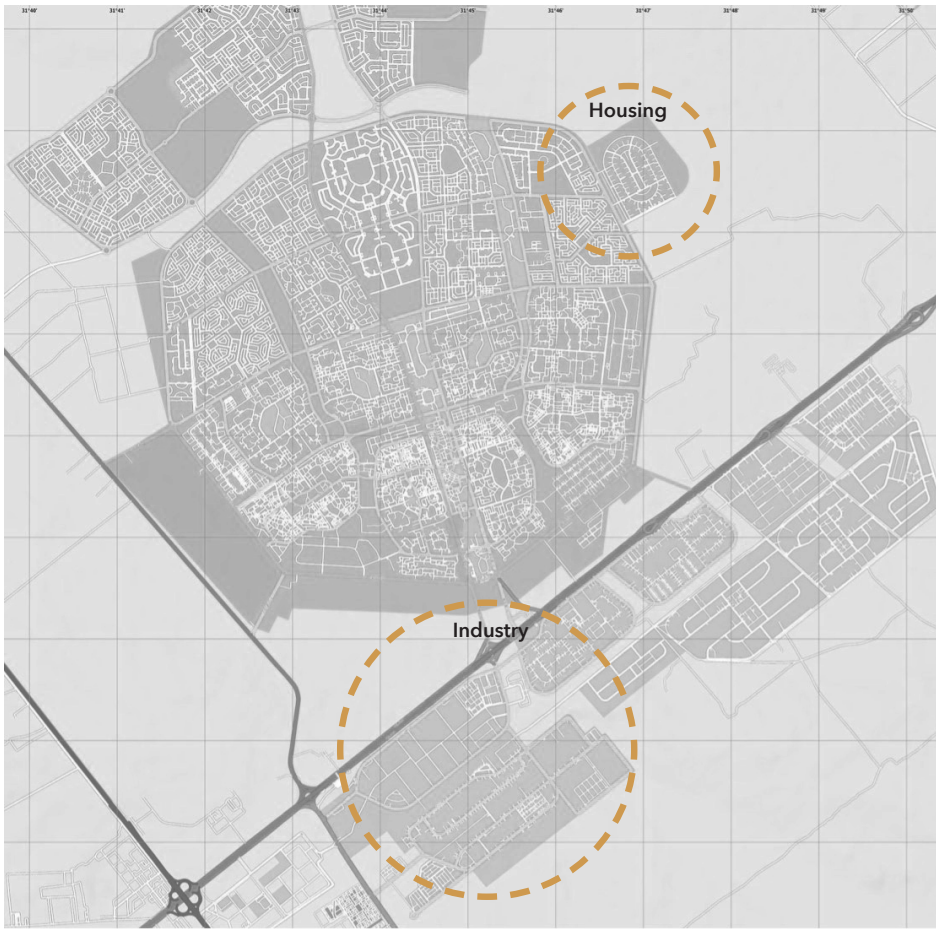


Figure 9 The Masterplan of the 10th of Ramadan city. Source: NUCA. Drawing by Author

Tenth of Ramadan City was established under Republican Decree No. 249 of 1977. The city is on the Cairo / Ismailia desert road, 55 km from Cairo, only 65 km from Ismailia, and about 45 km from Zagazig.¹³ According to David Sims, the 10th of Ramadan City should not be part of Cairo's desert towns. However, part of the Sharqiya Governorate is closer to the eastern Delta than Cairo, where most employees live around Bilbis or Ismailiya and commute daily to the 10th of Ramadan.¹⁴

It was the first new desert city in modern Cairo and is part of the first-generation cities of President Sadat's national urban strategy. With an industrial hub focusing on manufacturing, its proximity between Cairo and the Suez Canal boosted the city's growth. The target population aimed by the State was half a million, which later jumped to one million. However, in the 2006 census, the city attracted only 124,120 residents over thirty years. Although the town succeeded in attracting manufacturing giants, it failed in attracting a fraction of the targeted population.¹⁵

Almost 3000 productive factories currently take place, with an invested capital of 84 billion pounds, providing around 500,000 job opportunities. Furthermore, more than 1000 factories are under construction with an invested capital of 3 billion pounds, aiming to provide 87,000 job opportunities.¹⁶ In addition, more than 200,000 residential units have been in the city (26,104 housing units of various levels, 187,38 National housing units, 13,922 units implemented by the Cooperative Housing Fund, 116,629 housing units and 2,981 villas by the private sector).¹⁷



0 1 km

Figure 10 Street hierarchy and zoning in the city. Source: 4U Maps

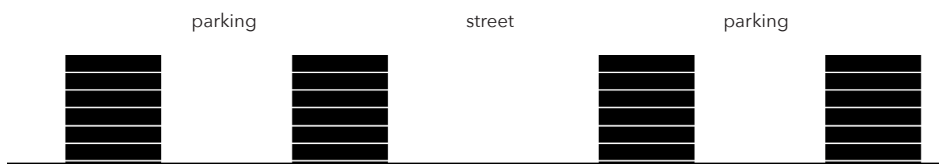


Figure 11 Section drawing in the social housing estate. Drawing by Author

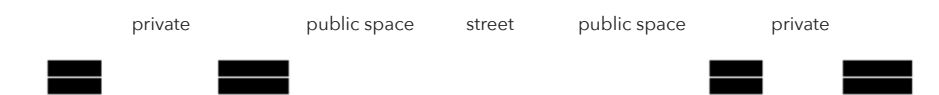


Figure 12 Section drawing in the Industrial Area of the city. Drawing by Author

The original Masterplan covers an area of 95 thousand acres, aiming to create a diversity of urban facilities. Although the city hosts more facilities than other desert cities, its urban planning is criticised for its segregation of functions. Separating housing and industries can be understood. Segregating housing from other services creates precarious urbanism.



Figure 13 Urban Segregation in the city. Source: NUCA

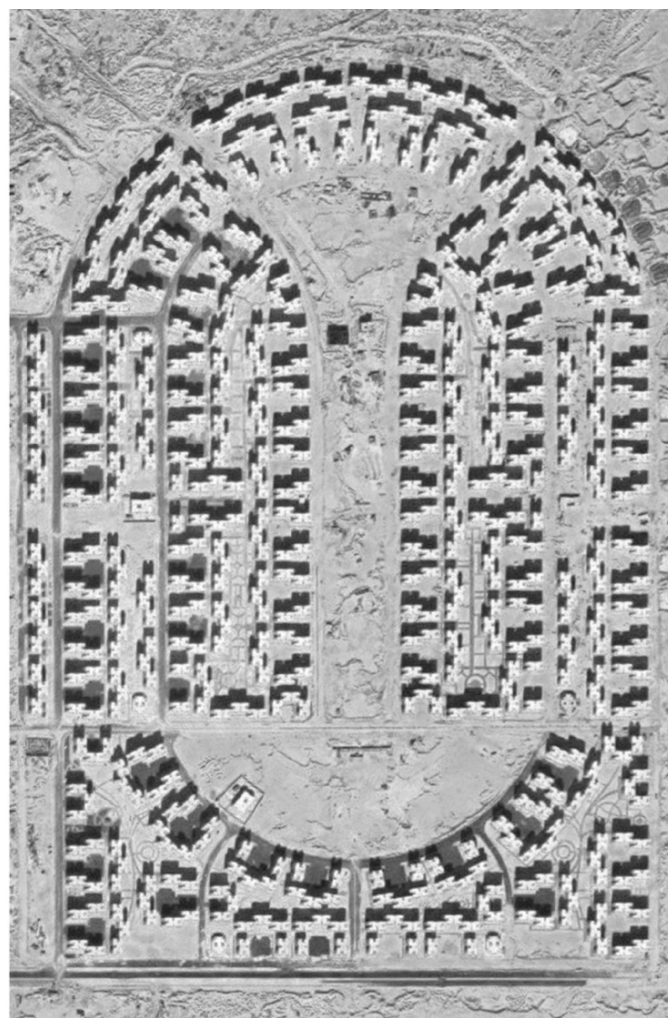


Figure 14 Masterplan of Social Housing Estate in 10th of Ramadan City.

Source: Google Maps

2. FIFTEENTH OF MAY NEW TOWN

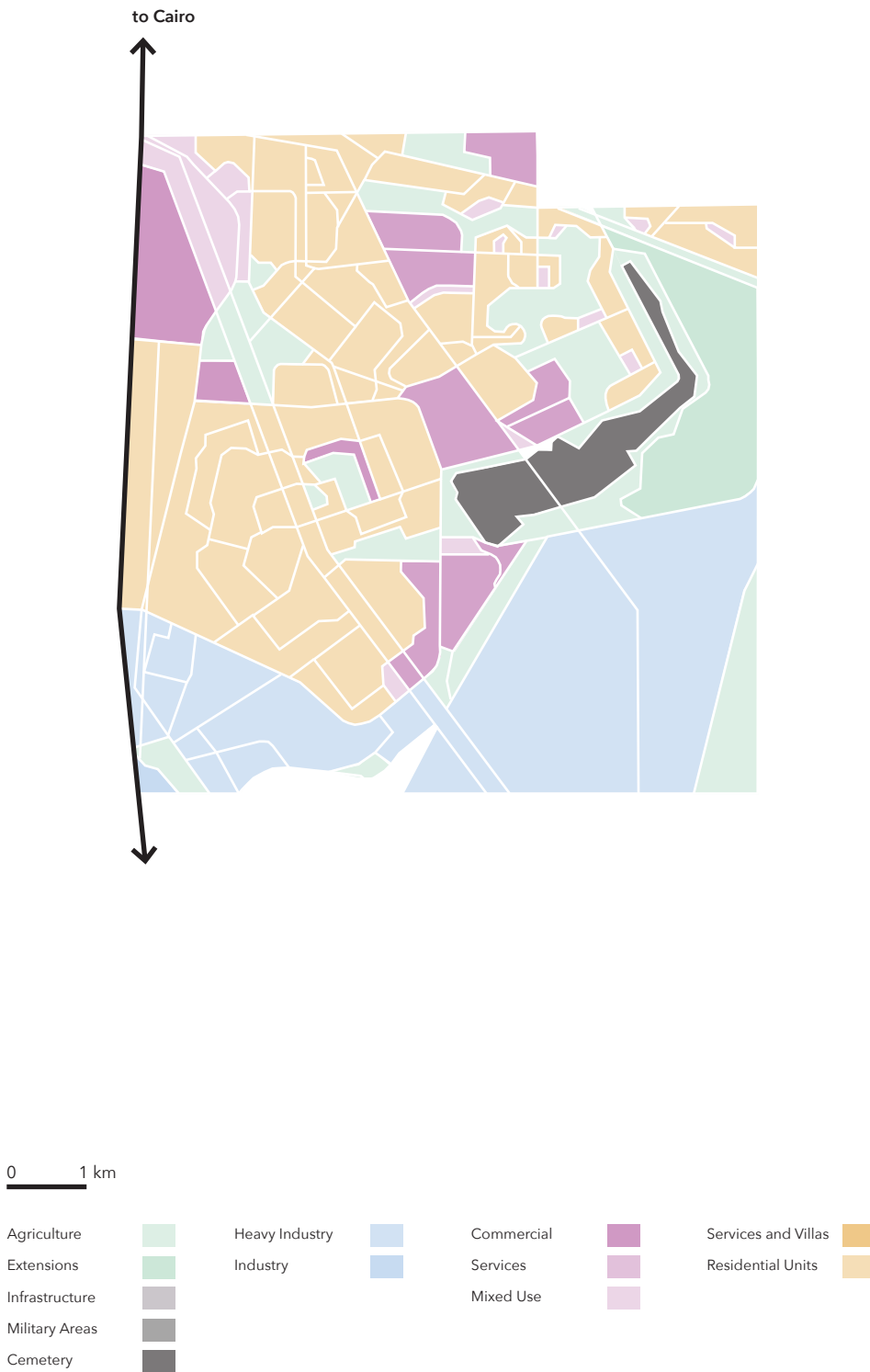


Figure 15 The Masterplan of the 15th of May City. Source: NUCA. Drawing by Author

Fifteenth of May was established by Presidential Decree No. 119 of 1978 with an area of 6461.9 acres. It extended to 1857 acres with Presidential Decree No. 237 in 1995. Another Presidential Decree No. 88 took place in 2009. The last expansion of 6099 acres was in 2017, with Presidential Decree No. 390. As a result, the total area of the city is 18,329 acres.¹⁸ It took place east of Helwan, 35 km from Cairo and bounded on the west by the Heliopolis / Helwan highway, on the east by the lands of State and armed forces, and from the south by the Upper Egypt - Cairo Al-Karimat road, and from the north by the land of the armed forces.¹⁹

The 15th of May is surprisingly one of the most successful desert cities that have succeeded in attracting new populations. The town has only 35.1 per cent of vacant flats, the lowest rate of all desert cities around Cairo. Nevertheless, the attracted number of inhabitants is much less than expected, where it attracted 90,000 inhabitants after more than thirty years, according to the census of 2006.²⁰

The Masterplan is built on seven phases, with 48 neighbourhoods, interspersed with an extension of four social housing estates. Over 70,000 housing units were placed, including 29,000 State built units.²¹

Two main industrial zones are in the town on 376 acres with 335 workshops. The first zone is on 57 acres, hosting 276 craft workshops, and the second is in the city's south, on 319 acres. In addition, another strategic plan was approved in 2017 to introduce an industrial park in the southern extension, on 647 acres, aiming to boost the city's economy and promote industries.²²

Symmetrical Masterplans dominate the typology of the urban layout in most desert cities around Cairo. The urban layout of the 15th of May does not follow this logic, as the urban fabric consists of polygonal and curved streets/blocks that are neither symmetrical in form nor function. Less than 50 per cent of the town's area is for housing, where the city hosts several multi-functional programmes. That is perhaps why the city has one of the lowest vacant residential units, where individuals are attracted to the town due to the variety of offered programmes. Another reason for the low vacant units is its good connection to Cairo and Helwan, as the metro line stops in the neighbouring city of Helwan.

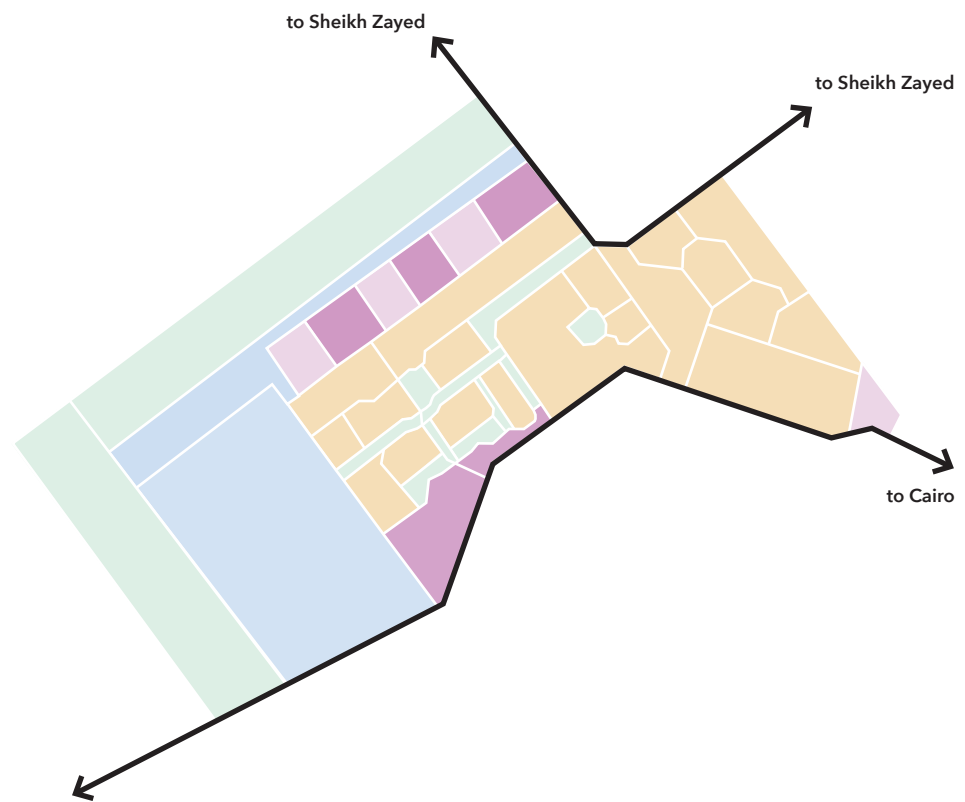


Figure 16 The social housing apartments in the city. Source: Google Earth



Figure 17 Section drawing in the social housing estate. Drawing by Author

3. SIXTH OF OCTOBER NEW TOWN



0 1 km

Agriculture		Heavy Industry		Commercial		Services and Villas	
Extensions		Industry		Services		Residential Units	
Infrastructure				Mixed Use			
Military Areas							
Cemetery							

Figure 18 The Masterplan of the 6th of October City. Source: NUCA. Drawing by Author

Launched in 1981, the 6th of October city was the third desert town around Cairo, with a target population of half a million inhabitants. It was also the first desert city to be designed by a national architectural firm. As the town was part of the first-generation cities, it focused on having an industrial base with residential units for workers. The Masterplan focuses on having an industrial area west with various public housing units and private housing plots in the east. The centre of the town hosts commercial activities, service delivery programmes and office buildings.²³

It is only thirty-five kilometres from the Capital's centre, west of Cairo. Construction started in 1980 when the city successfully attracted factories and manufacturing industries. However, it has failed to attract new residents as targeted. After fifteen years of launching, it has attracted only 35,000 inhabitants. According to the census of 2006, the 6th of October city has the highest number of residents in Cairo's desert cities, with 157,000 residents over 25 years.²⁴ Also, the 2006 census marked the increase in housing units, from 53,000 dwellings in 1996 to 142,000 in 2006. On the other hand, the 6th of October City has one of the highest percentages of vacant apartments in all desert cities around Cairo, 63 per cent.²⁵

The boundaries of the city were modified and enlarged in the early 1990s. Private developers acquired large plots at a "wholesale" price. Additionally, the State sold many small-size plots of land to individuals, with prices much lower than the market values. Probably, not enough to cover infrastructure investments.²⁶ The aim was to boost attracting new inhabitants, private universities and investments. According to the New Urban Communities Authority, during the year 2019/2020, investments reached 3.5 billion EGP (housing sector 409.003m EGP, water sector 424.169m EGP, sanitation sector 144.526m EGP, electricity sector 146.491m EGP, roads 2.285152m EGP and services sector 81.638m EGP). Investments over the past decade boosted urbanisation, where the population jumped to 1.35 million inhabitants in 2014, making it the highest populated desert city around Cairo. Since the target is to reach 3 million residents in 2030, investments will probably continue to pump into the town.²⁷

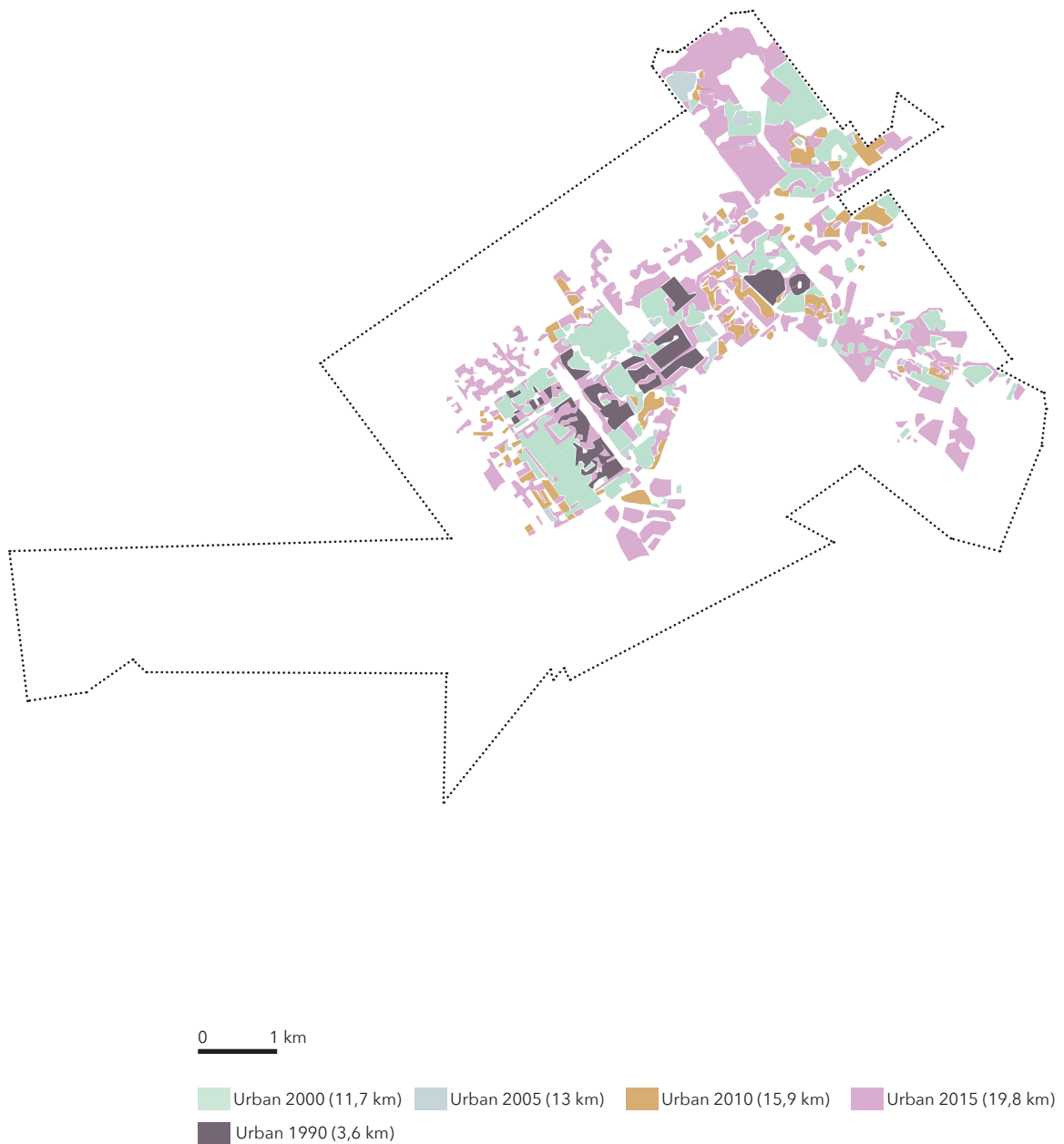
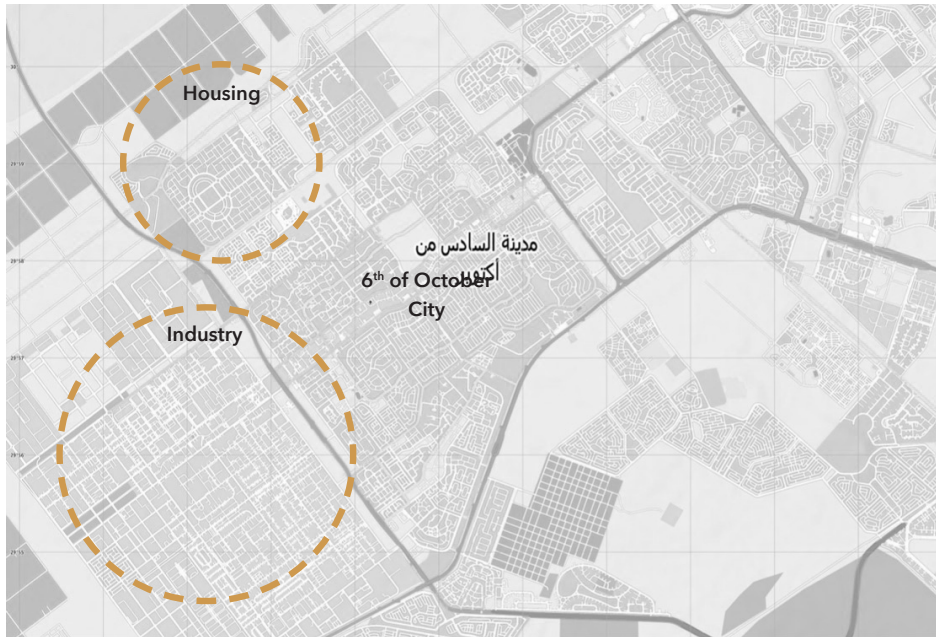


Figure 19 Urban development in the city since 1990. Source: Monitoring Urban Expansion Directions in 6th October City (Egypt), Mona Saad Ramada, Drawing by Author

The city's urban fabric is not much different from the rest of the desert towns. Low density, symmetry and segregation of urban services are standard across the city. Not only do the State's housing estates share these characteristics, but also privately developed neighbourhoods. Figure (23) is a satellite image of a privately developed district, a replica of the social housing estate in the 10th of Ramdan City figure (14).



0 1 km

Figure 20 Street hierarchy and zoning in the city. Source: 4U Maps

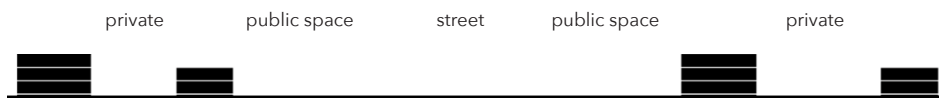


Figure 21 Section drawing in the Industrial Area of the city. Drawing by Author

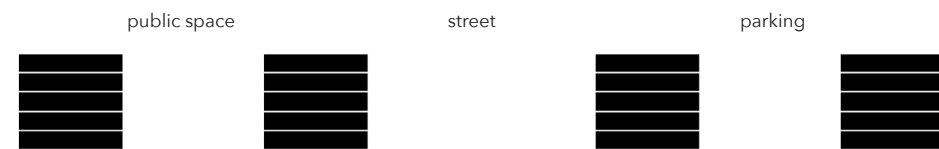


Figure 22 Section drawing in the housing districts. Drawing by Author

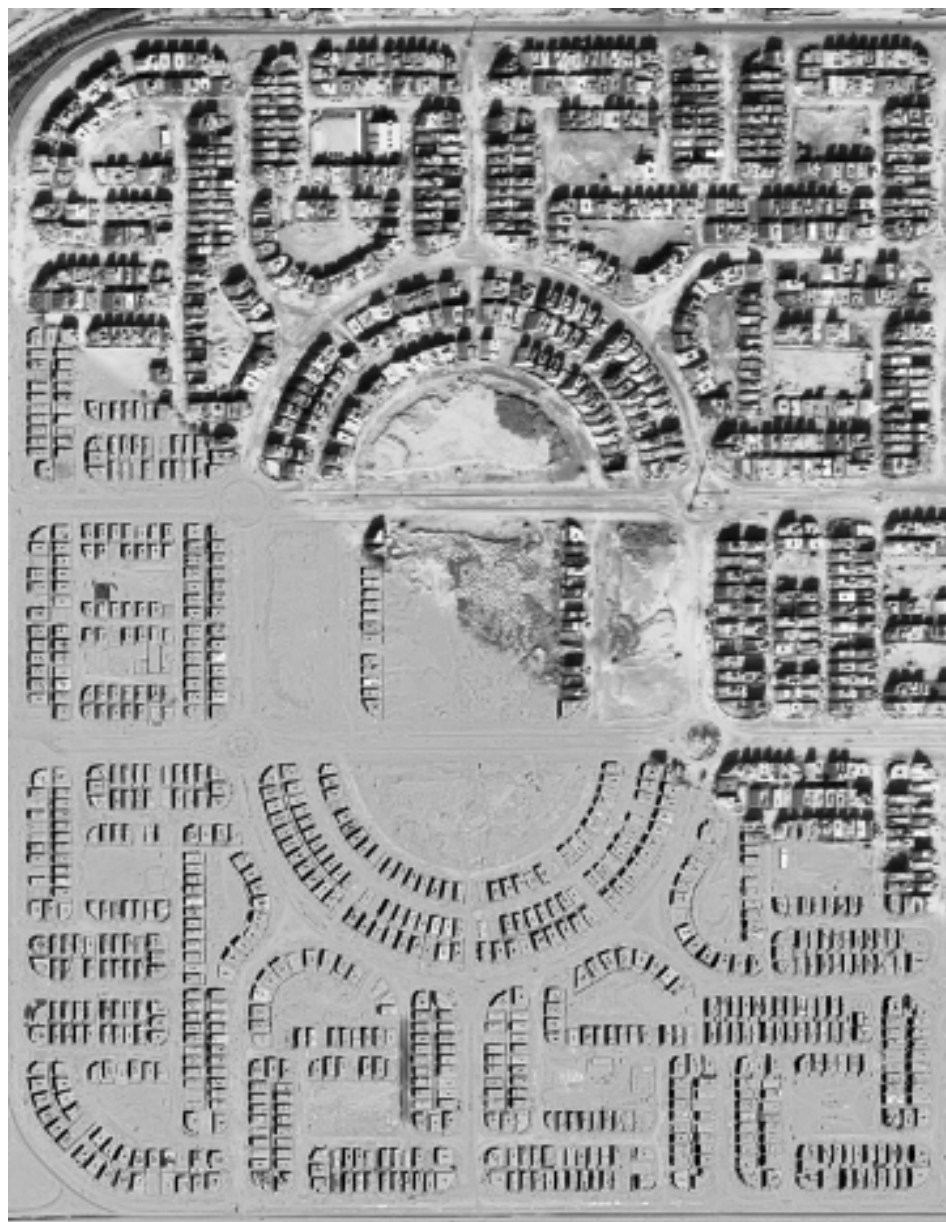
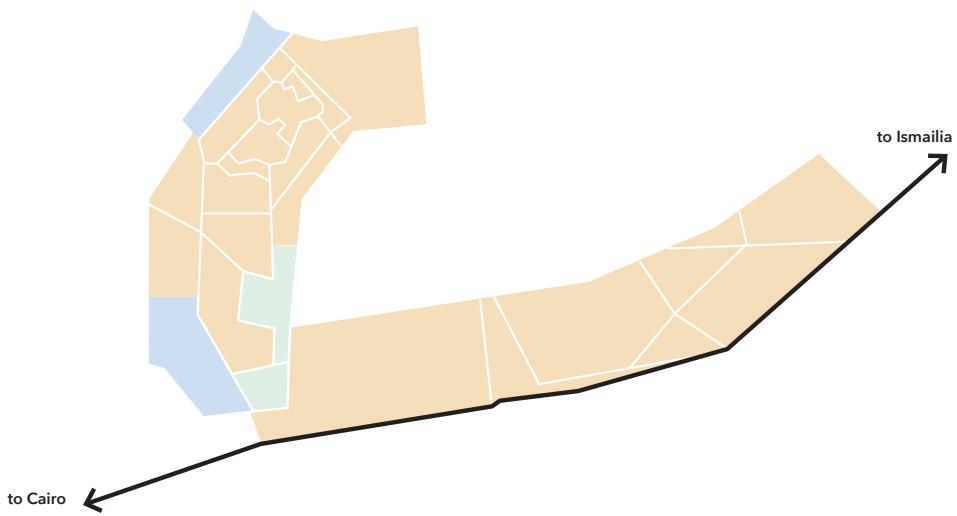


Figure 23 Private housing in the North-west of the city. Source: Google Maps

4. AI UBUR NEW TOWN



0 1 km



Figure 24 The Masterplan of AI-Ubur. Source: NUCA. Drawing by Author

The city is one of the second-generation cities around Cairo, with an industrial base and hosting Greater Cairo's wholesale market. It is a few minutes from the Heliopolis at the 26th kilometre Cairo-Ismailia Road and 10th Kilometre Cairo-Belbeis Road.²⁸ Urban planning took place in the early 1980s by the GOPP, and construction began in the late 1980s with several public housing projects. The Masterplan intended to have a solid economic base and an industrial hub, capitalising on the city's proximity to Cairo.²⁹



Figure 25 The vacant apartments in the city. Source: Google Earth

In the 2006 census, the city reached only 44,000 inhabitants, and nearly 65 per cent of the housing units were vacant. Although the town has an excellent location, close to Cairo, the attracted population is considered a big failure. On the other hand, NUCA is still targeting over one million inhabitants.³⁰



Figure 26 The vacant apartments in the city. Source: Google Earth

The wholesale market in the town became a melting pot for different food-industry producers, sellers and owners. With some French help in 1988, it got constructed. Its strategic location played a fundamental role in its success. Nowadays, the market is Greater Cairo's most important food and groceries wholesale market. Its success triggered further expansions towards the city's north, and industrial areas started to take place.³¹



Figure 27 The wholesale market in the south of the city. Source: Google Maps

Today al Ubur encompasses an area of fifty-four square kilometres, extending over thirteen kilometres in the north-south direction. Individual subdivision plots represent twenty-five square kilometres or almost half the town. Unfortunately, these residential areas did not attract many new residents despite the city's strategic location. It is close to Cairo's poor neighbourhoods like al-Nahda and al-Salam, where workers prefer to stay in Cairo and commute. On the other hand, the proximity to the poor districts did not trigger the middle class to move. Moreover, other desert cities offered better-gated community services, whereas the city has only one gated community compound.³²



Figure 28 Complete segregation in the urban layout. Source: Google Maps

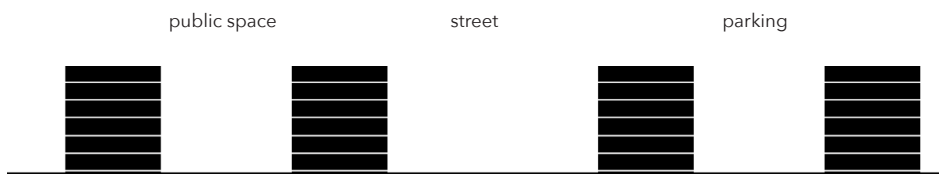


Figure 29 Section drawing in the social housing estate. Drawing by Author

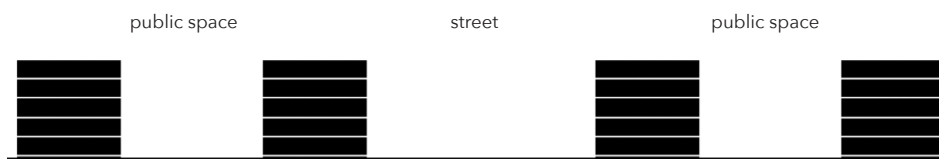
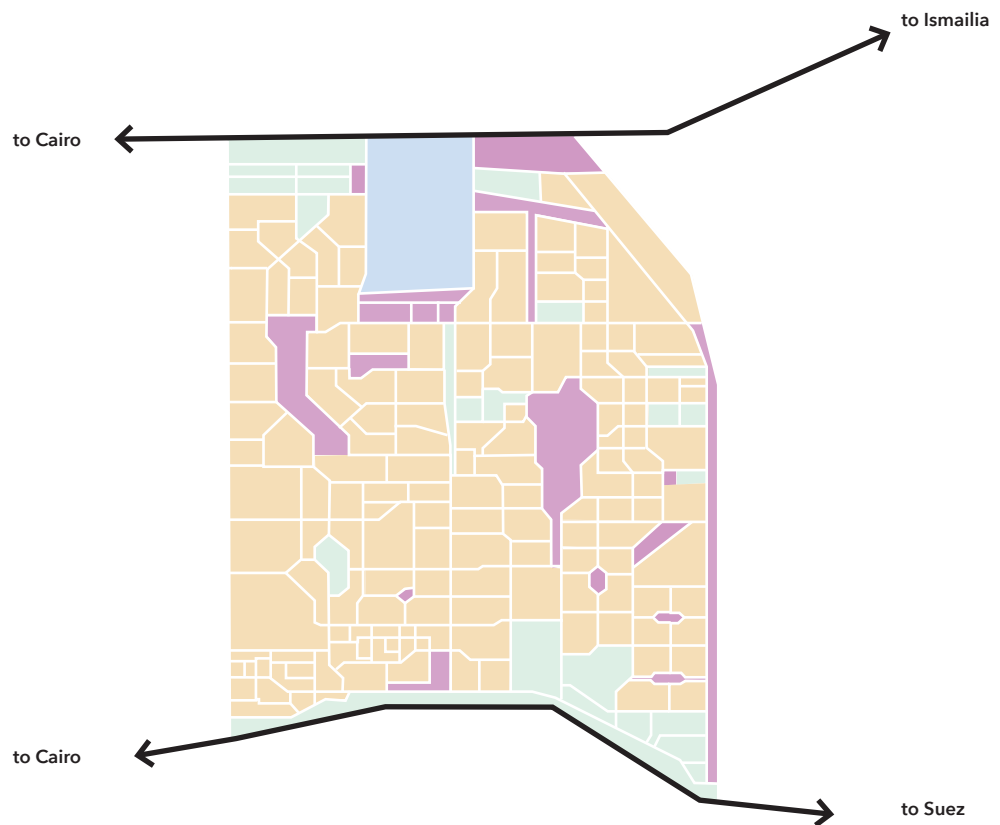


Figure 30 Section drawing in the private housing districts. Drawing by Author

After years of failure to attract residents, the State built its famous H-Block dwelling in the west, close to the neighbouring poor areas east of Cairo. The complete segregation of urban features is represented in the satellite image (Figure 28), where streets are almost slicing an urban fabric to have this monofunctional zoning feature.

5. AI-SHURUQ NEW TOWN



0 1 km

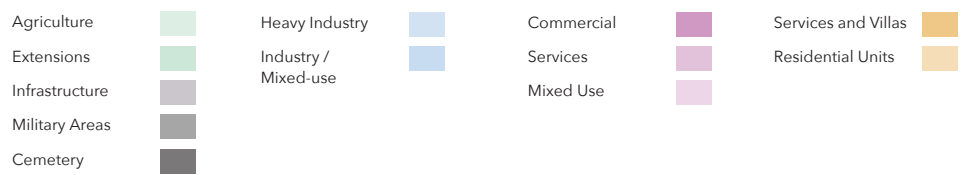


Figure 31 The Masterplan of the city. Source: NUCA. Drawing by Author

On 10,808 acres east of Cairo, Al-Shuruq got established in 1995 with a Republican Decree No. 326. Later in 2015, 5,302.3 acres were added following Cabinet Resolution No. 2119. According to the NUCA, the city has nearly 28,000 residential housing units. The city has a rectangular shape, between Cairo and Badr town and is only forty kilometres from Cairo's centre. Initially, it was not part of Greater Cairo's Masterplan, which seemed like an unnecessary addition as the space between the successful industrial 10th of Ramadan City and Cairo is empty desert land. The State proposed establishing a new town to link the cities. The Masterplan did not focus on attracting industries and creating job opportunities. It mainly aimed to have residential housing units, service deliveries and educational facilities.

According to the census of the year 2006, the city attracted only 21,000 residents. However, the State has sold all the residential plots to investors and individuals. The census of the same year recorded 28,000 built housing units. Although the housing sector investments exceeded 322.675 million EGP, the services sector cost 57.064m EGP, and the utility sector (including water, sewage, electricity, roads and communication) exceeded 547.9m EGP of investments. While the number of vacant housing units in al-Shurouk continues to increase, it is the most failed desert city around Greater Cairo to attract inhabitants, with nearly 80 per cent of vacant housing units.

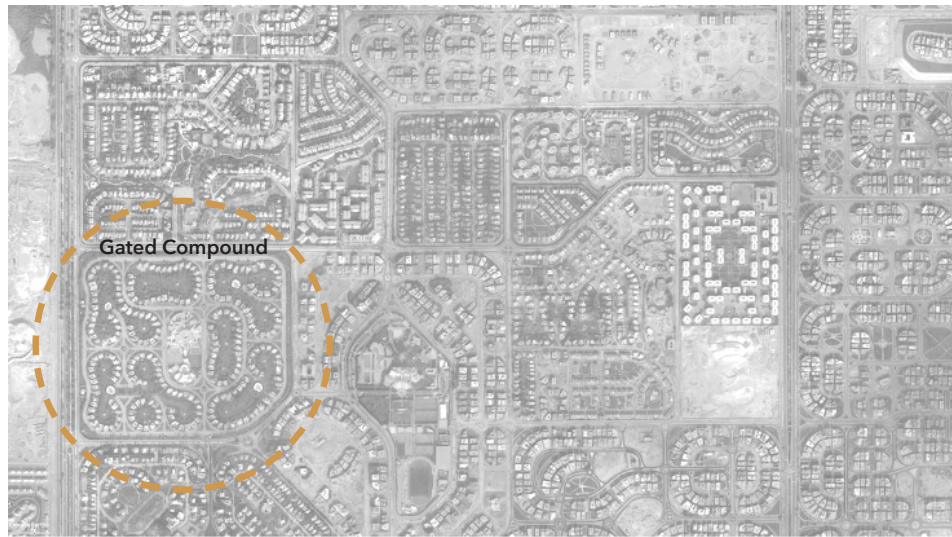


Figure 32 Islands of empty Gated Communities and Housing units. Source: Google Maps



Figure 33 Section drawing in the Gated Communities. Drawing by Author



Figure 34 The vacant apartments in the city. Source: Google Earth

After several interviews with residents, there are several reasons behind the complete failure not to attract inhabitants. First, the city's Masterplan and layout are monofunctional, where over 80 per cent host housing, creating an urban environment full of islands of housing units or gated communities. As a result, people do not feel the sense of urbanity, service deliveries and urban qualities that Cairo offer. Second, transportation plays a role, as the city is only connected by busses that do not run often.³³



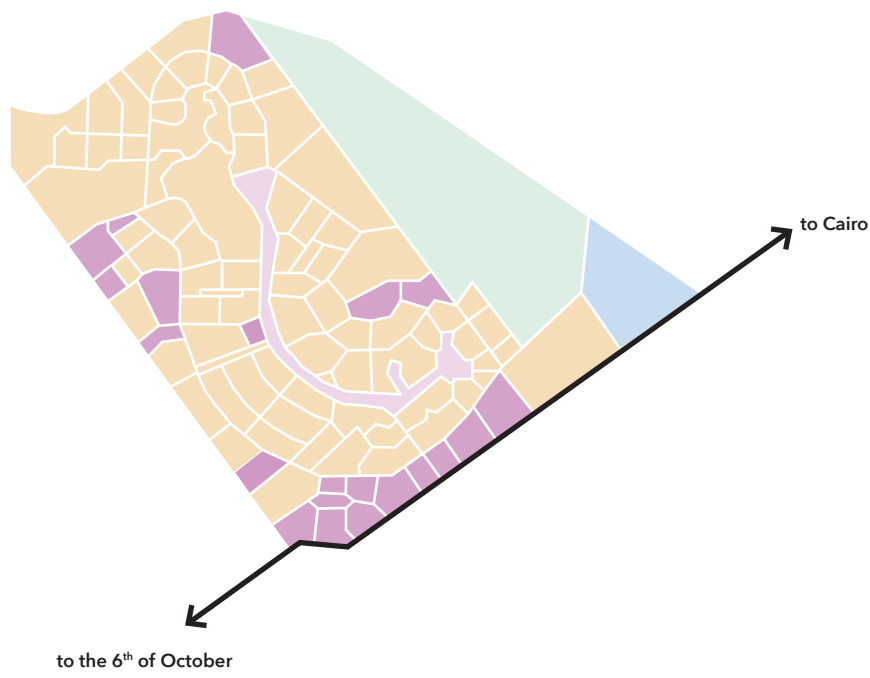
Figure 35 The social housing units in the city. Source: Google Earth



Figure 36 Symmetrical Urbanism, Extension on the west of the city. Source: Google Maps

The new extension west of the city is currently under construction, offering many housing units in a symbolic and symmetrical urban planning Masterplan. Are the real estate investors in the town envisioning something unseen? Why are Egyptian planners/architects in love with symmetrical urban layouts? Why is the Egyptian papyrus plant often found in modern Masterplans in Greater Cairo?

6. SHEIKH ZAYED NEW TOWN



0 1 km

Agriculture		Heavy Industry		Commercial		Services and Villas	
Extensions		Industry		Services		Residential Units	
Infrastructure				Mixed Use			
Military Areas							
Cemetery							

Figure 37 The Masterplan of the city. Source: NUCA. Drawing by Author

Sheikh Zayed City is 30 kilometres from Cairo's centre, on a hill elevated 99 meters above sea level. It is connected to a network of important roads to the north (Alexandria Desert Road), from the southwest (Dahshur Road) and from the southeast (the extension of the 26th of July Corridor Road).³⁴

Sheikh Zayed City was established by Presidential Decree No. 325 of 1995 on 10386.75 acres. A Republican Decree No. (77-230) of 2017, an extension will take place, and the total area becomes 21306.75 acres.³⁵

Sheikh Zayed Town is next to the 6th of October City in the western desert of Cairo. It mainly targets residential uses and misses an industrial base like many other desert towns. The State targeted half a million inhabitants by 2020. Nevertheless, it only attracted around 30,000 inhabitants in 2006 and 233,000 in 2014.³⁶

The city's zoning divides the city into three prototypes of superblocks: public housing estates, individual subdivisions and private compounds. According to the census of 2006, the city's population reached 29,000. That is less than six per cent of the State's target. In addition, Sheikh Zayed City can be classified as a monofunctional city, purely for residential use, missing industrial, educational services and service deliveries. Finally, the city has been relatively deserted since 2006, yet, fancy compounds like Mena City, Beverly Hills, al-Nada, and al-Rabwa have attracted the affluent society to the town.³⁷

Although the city is in the desert, it is generous with green surfaces, golf areas and open spaces. By interviewing some residents, it was fundamental for many new inhabitants to live in a "clean", "green and "low density" neighbourhood where they can escape the hassle of Cairo.³⁸ However, is that urban typology sustainable in the long run? While Egypt is suffering from water poverty, should the State continue producing cities with lots of green surfaces that do not respond to the desert context? Is it correct to have urban segregation between the rich and poor? What are the consequences of such actions?



Figure 38 Satellite Image from the City. Source: Google Maps



Figure 39 Section drawing in El-Rabwa Gated Communities. Drawing by Author



Figure 40 Section drawing in Beverly Hills Compound. Drawing by Author

Although the town has one of the modest surface areas in Greater Cairo desert cities, it has over 50 gated communities. This segregation and enclosure are probably the reasons behind attracting many gated community residents. However, the low density is also one of the features in the city, where most gated communities guarantee large green areas and low density to interest the wealthy society and produce an assemble of fenced clusters urban environment.

Municipality	Total number of GC	GC with residential uses	GC with non-residential uses	GC Area (m ²)	GC Area (feddan)
New Cairo	237	220	17	197.038.399,99	47.000 Fdn
El Shourook	37	35	2	6.614.007,90	1.575 Fdn
El Obour	2	2	-	2.351.657,76	560 Fdn
El Sheikh Zayed	53	50	3	18.111.495,11	4.312 Fdn
Six October	164	159	5	81.732.320,22	19.460 Fdn
Total	493	466	27	612.418.800	72.900 Fdn

Table 41 Number of Gated Communities in Greater Cairo. Source: Ghonimi, Islam & al, ghonimi. (2013). Identification of Gated Communities in Egypt. Table by Author

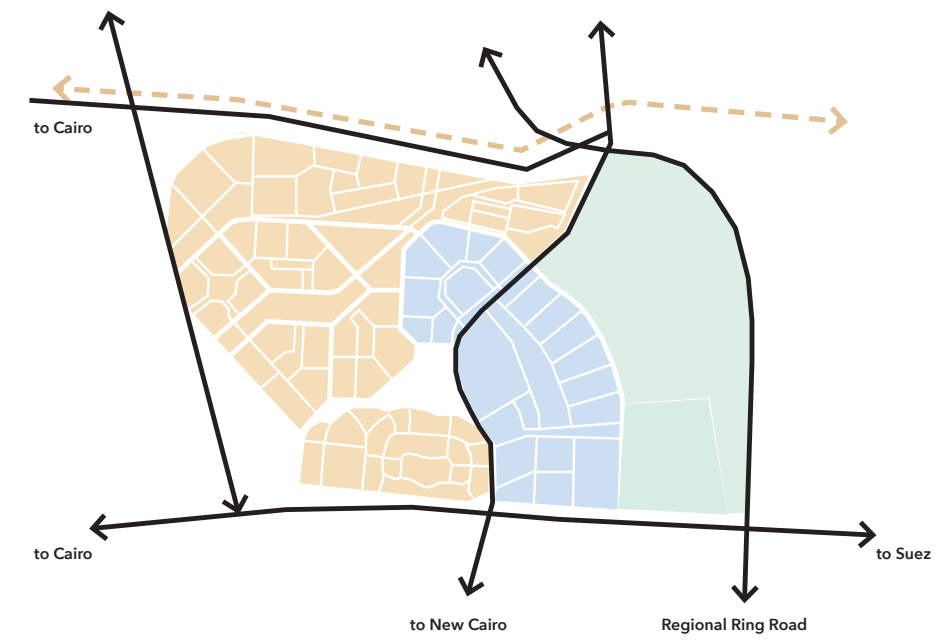


Figure 42 The Gated Communities in the city. Source: Google Earth



Figure 43 Urban Blocks in Sheikh Zayed City. Source: Dailynewegypt.com

7. BADR NEW TOWN



0 1 km

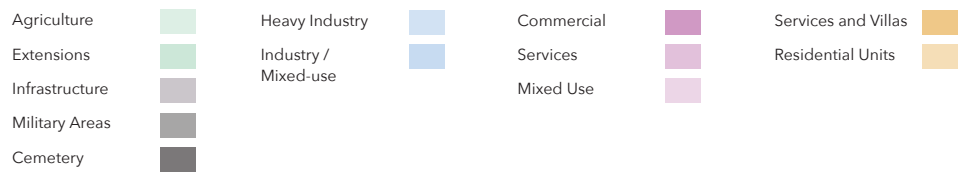


Figure 44 Zoning of Badr City. Drawing by Author

The city was established based on Prime Minister Decree No. 235 of 1982, on 2971.34 acres.³⁹ Later, the area was modified by Republican Decree No. 87 of 2009, with a total size of 18545.43 acres (around 7018 acres for housing, 2200 acres for industry, 2173 for services, 3956 acres for green spaces and 580 acres for logistics). Badr's location is on the Cairo / Suez road, 47 km from Cairo. It is about 230 meters above sea level, making the city 4 degrees cooler than the rest of the desert cities.⁴⁰ Badr City is considered the second furthest new town from Cairo. It takes place fifty-three kilometres from Cairo's centre. The city is still mostly undeveloped, although it is next to the most significant industrial hub around Cairo, the 10th of Ramadan City. The census of 2006 scored only 17,000 inhabitants living in Badr City.⁴¹

The city has one of the highest numbers of social housing units around Cairo's desert, with 92,280 residential units, most of which are vacant. Some of the social housing units in Badr City were part of the slum clearance projects before 2011. Slum inhabitants have avoided reallocation due to urban segregation, lack of job opportunities and absence of service deliveries. Also, the industrial zones did not succeed as it was intended to attract and relocate the old factories of Cairo. Although the boundaries of Greater Cairo and its cities expanded towards the east, many people still consider Badr City very far. On the other hand, the New Administrative Capital is taking place south of Badr City, which might be a trigger to attract new population, industries and new jobs.



Figure 45 Deserted Social Housing Estates. Source: Omar Diab



Figure 46 Deserted Social Housing Estates. Source: Omar Diab



Figure 47 Deserted Social Housing Estates. Source: Omar Diab

8. NEW CAIRO NEW TOWN

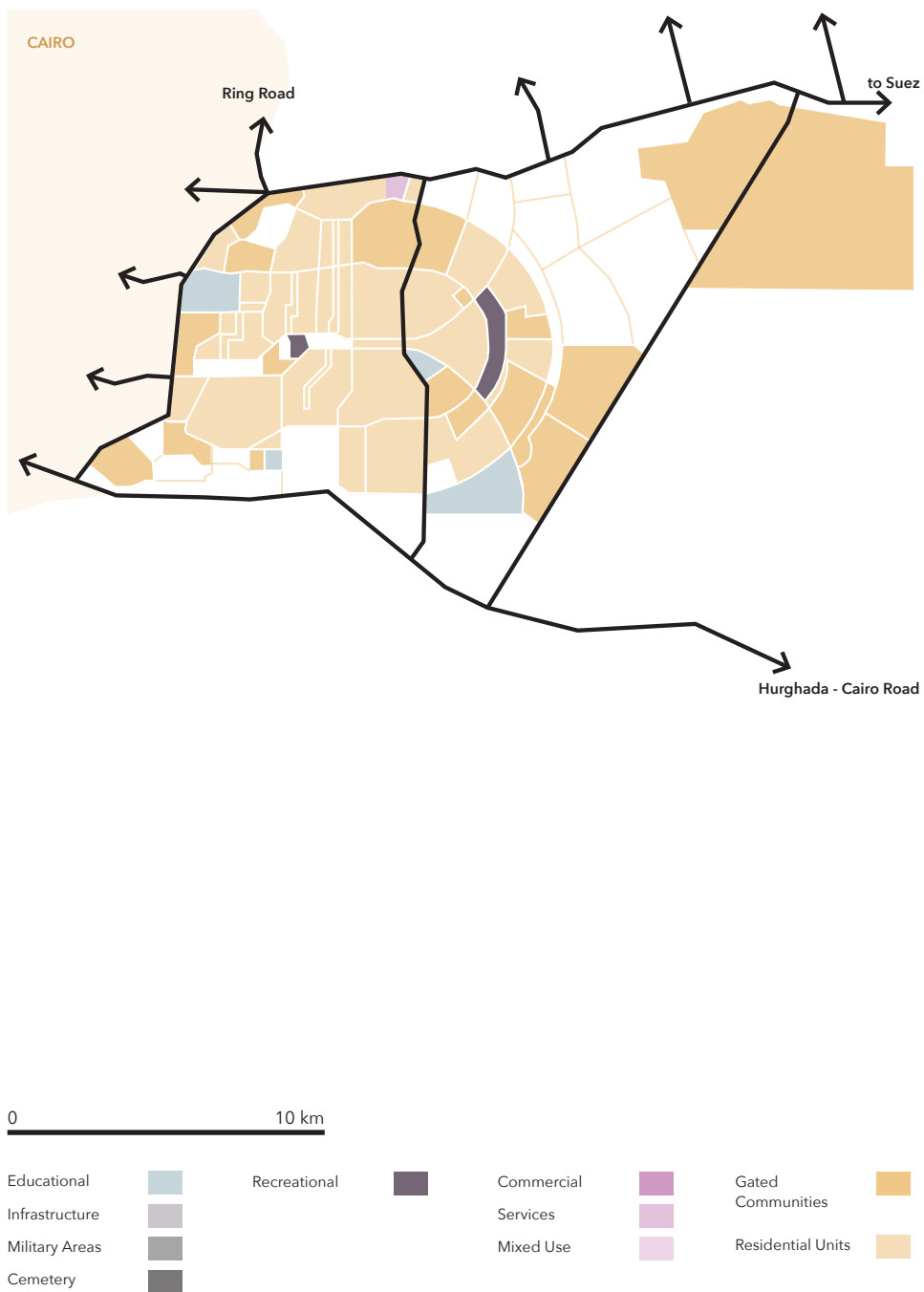


Figure 48 Zoning of New Cairo City. Drawing by Author

New Cairo City might be the most prosperous town in attracting residents, businesses and educational institutions around Cairo's desert cities. It takes place east of Cairo, between the Ring Road and Cairo Suez Road. The original plan was to host residents of the slums as part of the slum clearance project that was planned to take place. Instead, the State planned three new settlements, each to host 200,000 inhabitants in social housing blocks, in the 1980s.

As New Cairo City was much higher than the sea level and Cairo, pumping water from Cairo to the new town was expensive. As it was for slum residents to relocate to, the government changed its target population group to middle-class and wealthy groups to cover the high construction costs. By doing that, the State has sold all the plots to investors and individuals, while some areas hosted social housing dwellings.

In 1989, the city was officially a single town, where the three settlements were combined, nearly 13,000 acres, almost as big as Cairo. It has Egypt's first golf course compound, Mubarak Police City, the German University in Cairo, the American University in Cairo and many other major institutions. The Masterplan of the city focused on having a 10 km commercial spine pathing through the town. Also, it had several residential superblocks, with service deliveries, lots of open spaces and green surfaces.⁴²

The city was divided into three developments: public housing estates, individual plots and private compounds. The town's urban environment is similar to the 6th of October City. The city had all the facilities to succeed. Its location is right on Cairo's borders, accessible from the Ring Road and Cairo / Suez Road, close to Cairo's international airport and not far from the industrial 10th of Ramadan City.⁴³

As soon as Qattamiya Heights (the first gated community with golf courses) opened, New Cairo's reputation became very attractive to wealthy people. After that, Al-Rehab City joined as a gated community with different target groups on a scale as big as a city. Private schools, private universities and several institutions started to take place. On top of these universities is the American University in Cairo, built on 104 acres of land, and the new campus costs \$400 million. Also, the German University in Cairo built a large university campus.⁴⁴

The census of 2006 recorded 119,000 inhabitants but lots of empty apartments. In 2006, over 64 per cent of the housing units were vacant or closed. However, the city has expanded quickly in the last few years, successfully attracting a large population of rich people and businesses and having some of the best educational facilities in Egypt.⁴⁵

The city's boundaries have been expanded several times, mainly towards the east. After the success of Al-Rehab city in New Cairo, the same developer Talaat Mostafa Group founded Madinaty (a gated city) at least forty-four km from the centre of Cairo and directly connected to Cairo / Suez Road. Not only is Madinaty taking place, but several new small cities also took place in New Cairo, like Future city and other large gated communities. Thus, New Cairo has bypassed 264 square kilometres, which is more than half of Greater Cairo's area.



Figure 49 New Cairo city from the sky. Source: www.oddizzi.com



Figure 50 Madinaty Gated Community in New Cairo. Source: Menafn.com

9. NEW ADMINISTRATIVE CAPITAL

After President Abdel Fattah al-Sisi won the presidential elections, he took some important decisions regarding the physical environment of Egypt. An extension of the Suez Canal, expanding the urban environment all over Egypt to absorb the growing population, increase the area of agricultural land, produce more energy and create fourth-generation cities. For the first time, Greater Cairo's region is not taking most of the share of the investments. Over twenty new fourth-generation cities are in Egypt, and only four cities are around Greater Cairo. The largest city of all is the New Administrative Capital, between Cairo and Suez. The New the 6th of October city is the second-largest fourth-generation town around Greater Cairo. Also, an extension for Sheikh Zayed city will take place, named New Sheikh Zayed City. In addition, al-Ubur City has an extension to its urban environment called New al-Ubur City.⁴⁶

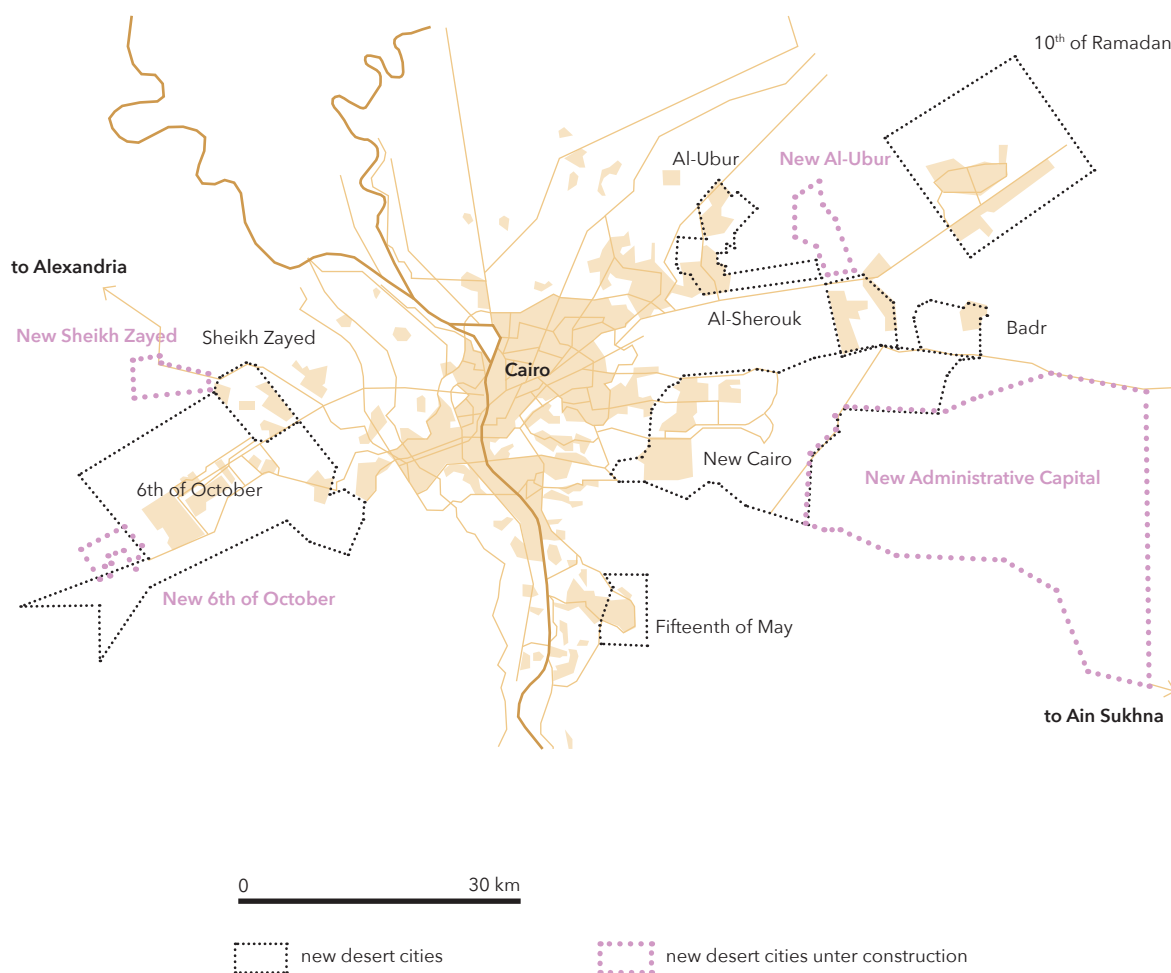


Figure 51 Desert Cities around Cairo in 2021. Drawing by Author

According to the NUCA and the State, the idea of introducing the New Administrative Capital City is to boost Greater Cairo's leading political, cultural and economic centre for the MENA region.⁴⁷

On 170 thousand acres east of Cairo, the State has chosen that prime location because of its proximity to the Suez Canal area, regional roads and main axes. It targets five million inhabitants for the project's first phase. Also, 40 to 50 thousand government employees will be transferred to the new headquarters of the Government District. After the first three years, the government will increase the capacity to 100,000 employees.⁴⁸

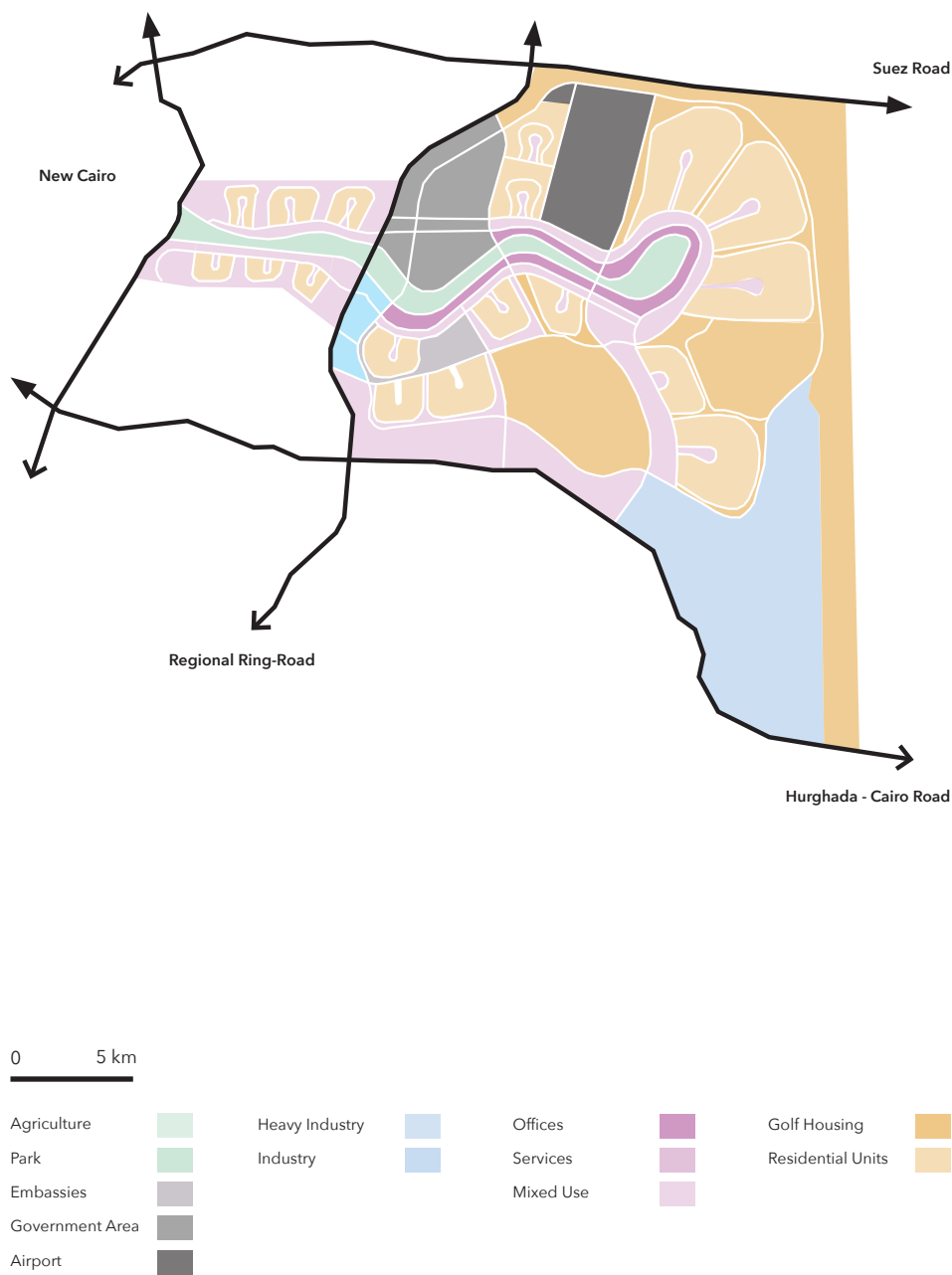


Figure 52 The Masterplan of the New Administrative Capital. Drawing by Author

It is still unclear how the city will succeed in achieving its ambitious targets. Also, the public's opinion is ambiguous as much information is not shared with the public. However, since the beginning of the desert cities around Cairo, that has been the most ambitious urban project. Moreover, with this construction pace, this is the fastest town to be taking place in Egypt.

10. NEW 6TH OF OCTOBER

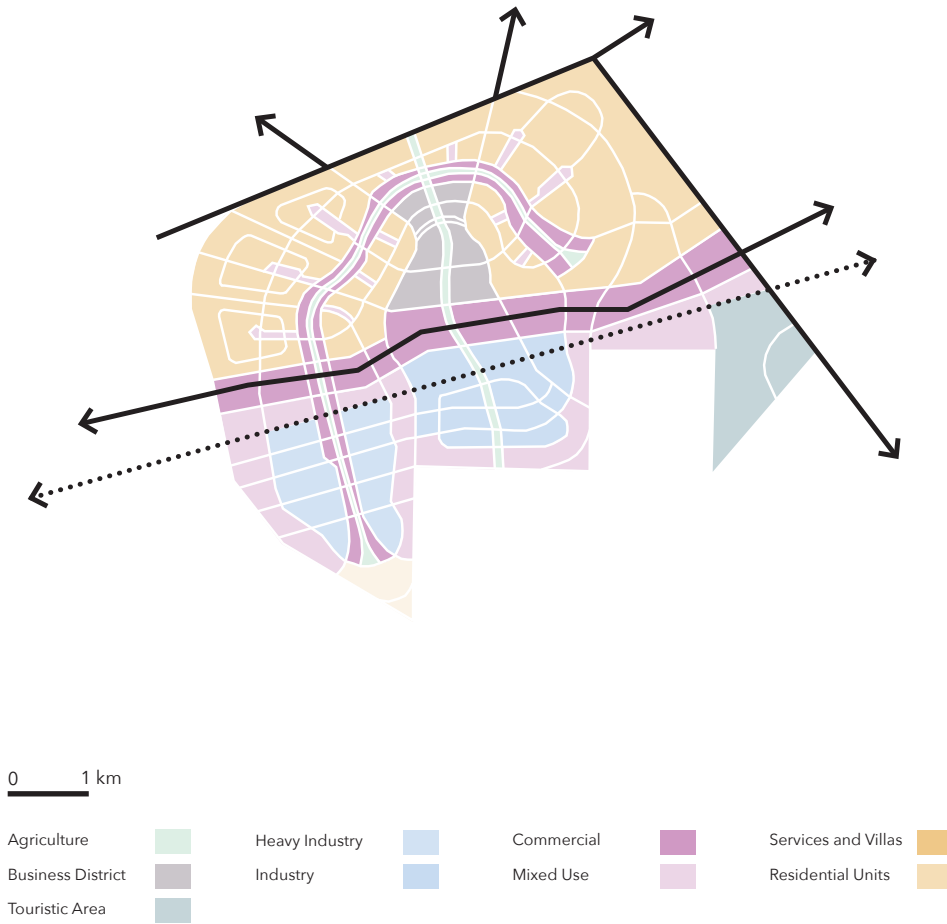


Figure 53 The Masterplan of the New Administrative Capital. Drawing by Author

The expansion will take place in six zones as an extension of the existing city. The first is on 1800 acres with 4,950 housing units. The second is on 1000 acres with various residential uses. The third is on 600 acres hosting 2606 residential plots and services. The fourth is on 435 acres with 330 social housing dwellings. The fifth is on 850 acres with 751 social housing dwellings. The sixth offers an industrial area on 484 acres with 260 small-sized factories.⁴⁹

Although the city is a fourth-generation town, its Masterplan does not indicate that. Its social housing neighbourhoods are a replica of the old social housing Masterplans. The fourth and fifth zones are designed similarly to first and second-generation cities, where a grid of H-blocks takes place, and each floor has four identical apartments. Like the New Administrative Capital green river, a spine runs over the city. However, the scale of the New the 6th of October spine is much smaller. The State's point of view is that the linear core would bring green surface qualities to every neighbourhood in the city. Nevertheless, it is unclear if the spine would be as green as the Green River in the New Administrative Capital, which opens many sustainability questions.

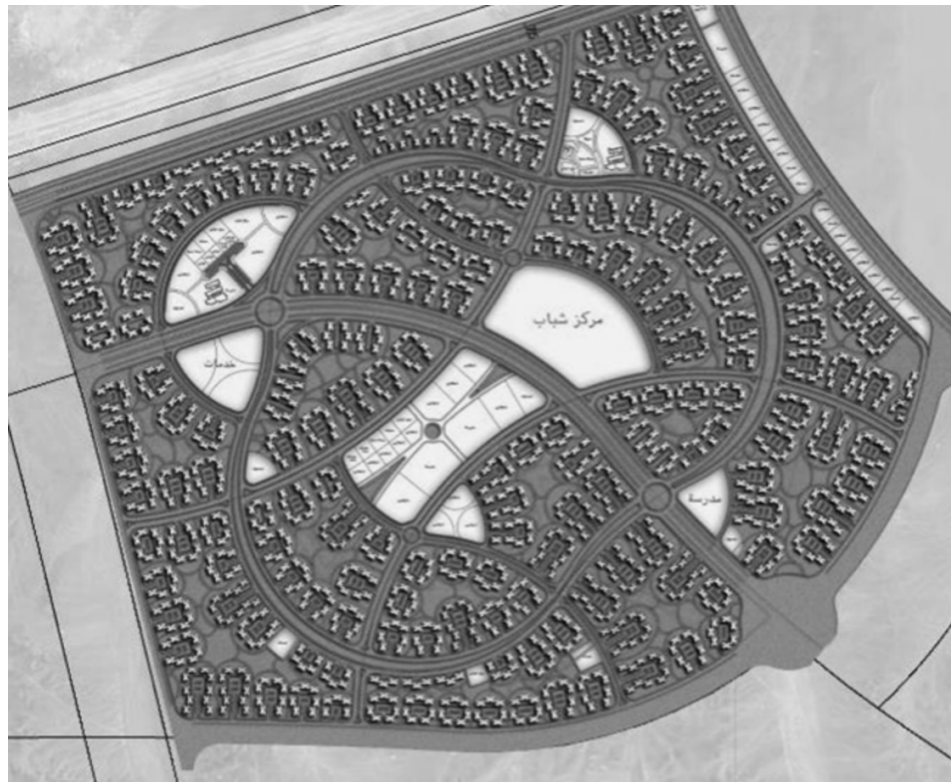


Figure 54 The Fifth Zone. Source: mhuc.gov.eg

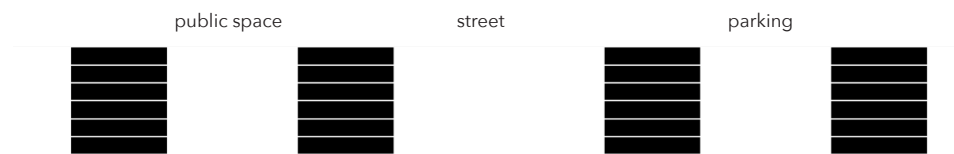
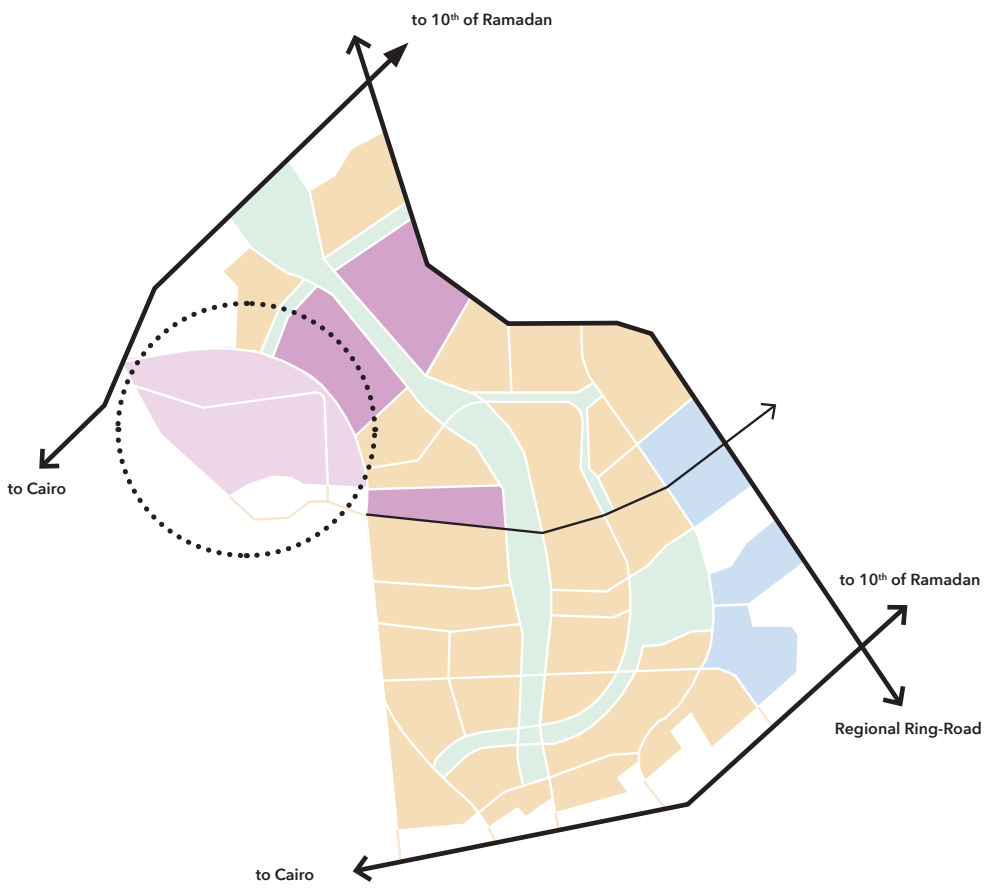


Figure 55 Section drawing in the Social Housing in the Fifth Zone. Drawing by Author

The Masterplan of the Fifth Zone presents the State's copy-paste urbanism of the H-Block dwellings. Segregation of services is a dominant feature in the urban environment. Services take place in the centre of the Estate and in the surroundings, which is a significant development compared to the old social housing estate in the earlier generations, where services did not occur. On the other hand, the Masterplans, density and housing typologies in more or less similar to the first three generations. That raises the question of whether the new generation cities are for marketing or are a fundamental change.

11. NEW AL-UBOR CITY



0 1 km

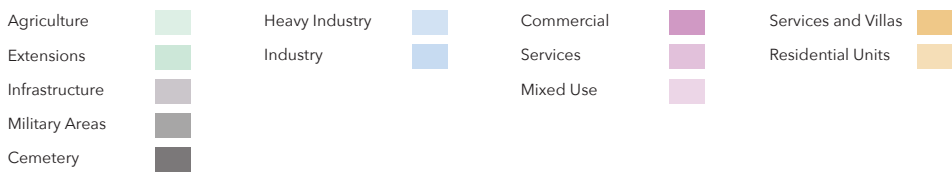


Figure 56 The Masterplan of the city. Source: NUCA. Drawing by Author

The city was established based on presidential Decree No. 249 of 2016. The extension of Ubur will be on 58,914 acres. The town is bounded west by Ubur town and from the south by al-Shorouk City. The Armed Forces will retain ownership of six sites inside the city.⁵⁰

Since the original city did not attract residents due to its proximity to the poor neighbourhoods in the west, the State is boosting New Ubur city with social housing estates to absorb more residents of the precarious areas and fewer neighbourhoods for wealthy individuals. Although the State has produced different morphological and visual appearances of many social housing dwellings, their floorplan typologies are similar to the old ones in the first, second and third-generation cities. For many Egyptians, these housing units are not comparable to the "informal" settlements in building conditions and safety. However, they do not offer social, physical and financial qualities as in the "informal" neighbourhoods.

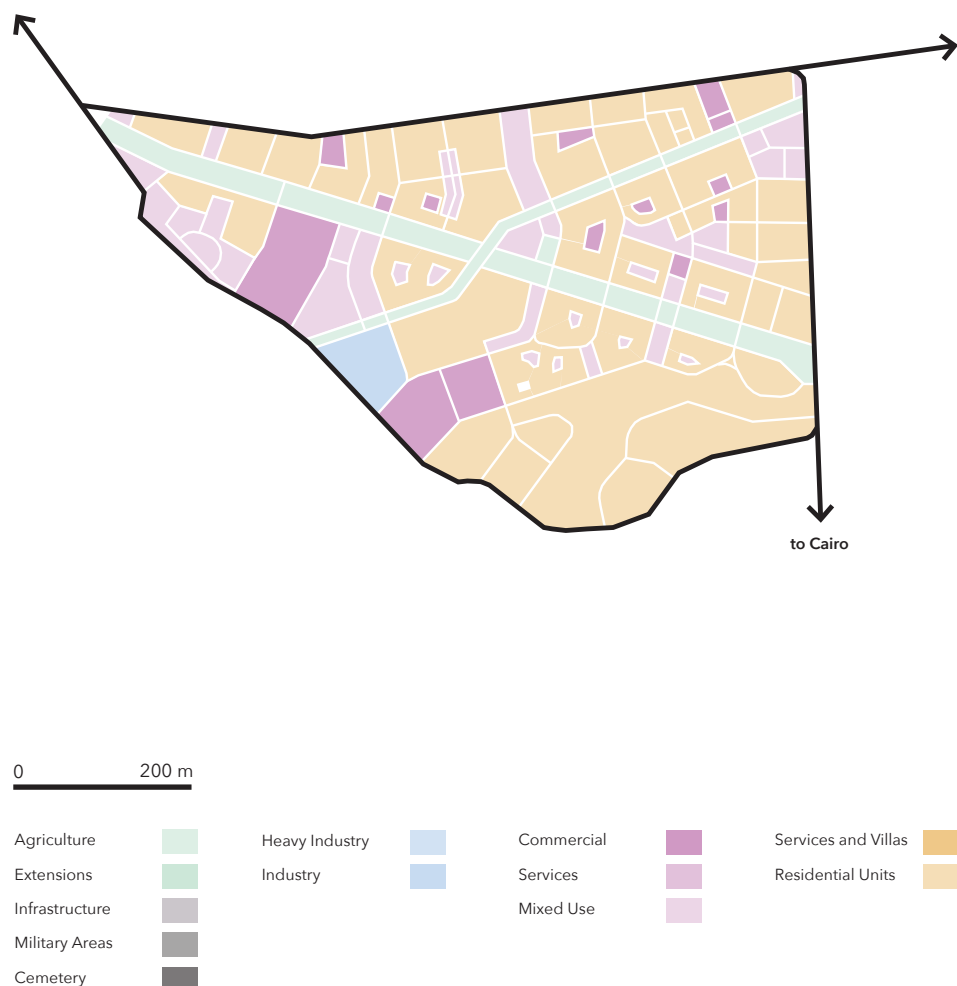
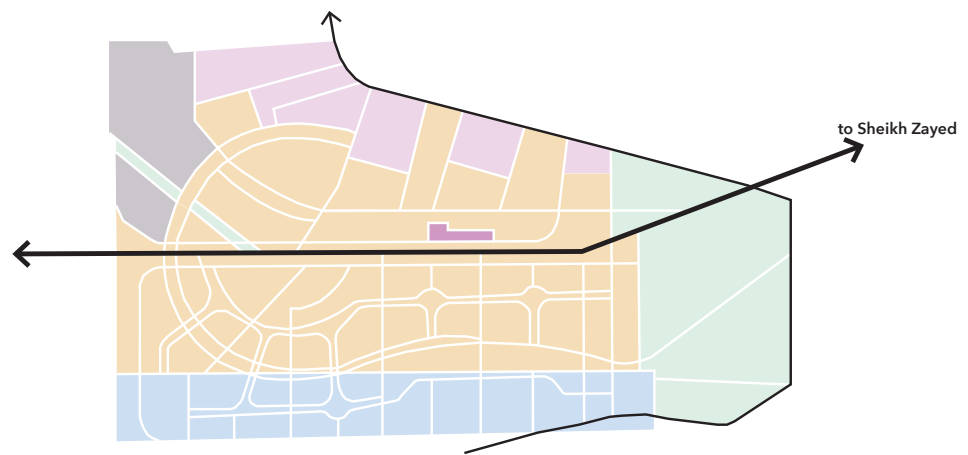


Figure 57 The first phase of the extension, on 2600 acres. Source: NUCA. Drawing by Author

Like the city's Masterplan, the first phase has a central green spine and diagonal green axes that host green areas. The dominance of housing neighbourhoods is also present in Figure (57), yet the presence of mixed-use and commercial activities is stronger than the Masterplan of the overall city. Overall, it seems optimistic to integrate many service deliveries and mixes-uses, but it is too early to judge the fourth-generation cities. Unfortunately, one can not analyse a clear shift in the urban planning mechanism or the decision-making process.

12. EXTENSION OF SHEIKH ZAYED



0 1 km

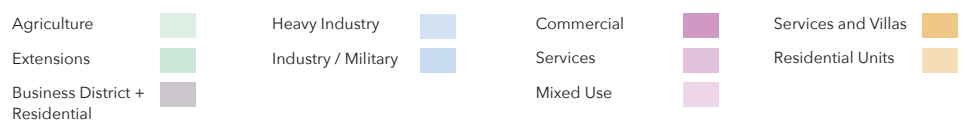


Figure 58 The Masterplan of the city. Source: NUCA. Drawing by Author

The extension of Sheikh Zayed City is also part of the fourth-generation cities. Also, it has a similar Masterplan, where a spine runs through the town and aims at connecting different zones. As a result, the city's ratio between services and mixed-uses is relatively higher than the older new cities generations. Also, the percentage of Industrial areas in town is higher, which hopes to generate more job opportunities than in earlier cities. Green spaces are also more prominent in ratio than in older generations, yet scarce water resources raise the sustainability of that feature.



Figure 59 Skyscrapers as a new feature to the desert cities. Render Image by: skyscrapercity.com

There are standard urban planning features by analysing the Masterplan of the city and other fourth-generation cities:

First is the green spine, which advocates bringing pedestrian and walkable scenarios to the city.

Second: a newly designed facade for the social housing dwellings, with the same floorplan distribution.

Third: lower urban densities and more green spaces.

Fourth: introducing skyscrapers hosting residential and commercial use (not in all fourth-generation cities).

However, are these features achieve "smartness", "sustainability", and "better quality", as the NUCA is advocating? It is too early to judge, but it is still evident that the State's top-down decision-making mechanism did not change, neither, the process of planning and design.

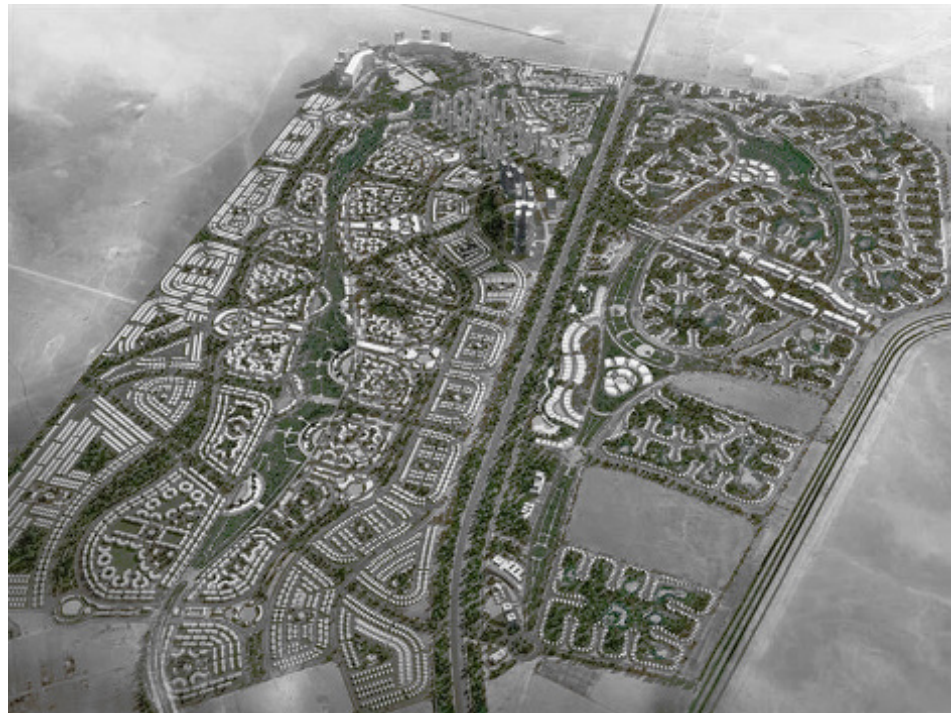


Figure 60 Segregation of the Urban Fabric is still a feature in fourth-generation cities. Source: skyscrapercity.com

The information and assessments in this section stem from interviews with key people unless they involve facts derived from published statistics, such as distances, population figures, and infrastructure details.

The selection of interview participants was deliberate and not arbitrary. Individuals were chosen and approached for interviews based on their comprehensive knowledge of one or more Desert Cities. These individuals are integrated into social networks through their professional roles or social functions, and they possess diverse contacts within the broader Cairo region, particularly in the Desert Cities.

It is important to note that the interviews were not intended to constitute a representative survey. Instead, the goal was to gather additional insights and evaluations from the standpoint of residents and users rather than relying solely on expert analyses.

Although a standardized set of questions was used for all interviews, fostering consistency, the interactions maintained the nature of open conversations. Interviewees were encouraged to articulate problems and highlight aspects that might not have been addressed in prior studies or publications, perhaps because they weren't of immediate interest to the interviewees.

This approach allowed for the exploration of interviewees' perspectives and opinions on specific factors (such as the quality of transport connections, social infrastructure, and usability of public spaces). Simultaneously, interviewees had the opportunity to share their views on challenges and events in their daily lives.

Annual average growth (% of attracted population / number of years)

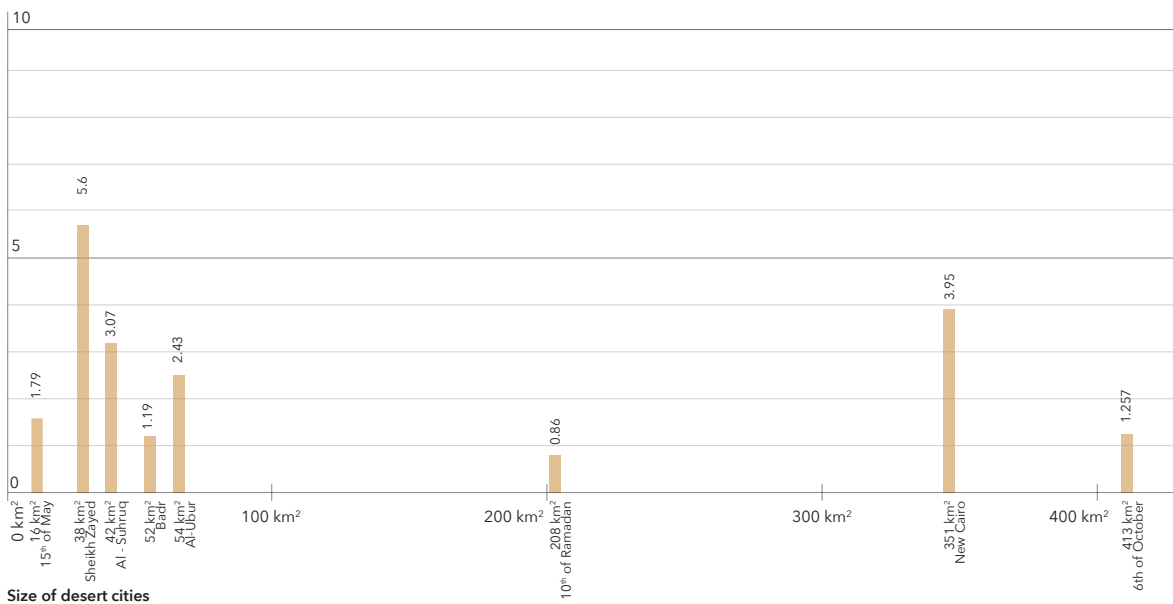


Figure 61 Annual average growth (percentage of the attracted population / number of years) and the sizes of the desert cities. By: Author

New Cairo Desert City:

New Cairo desert city exhibits a strikingly high annual population growth rate despite being the second largest desert city around Cairo. This anomaly can be explained by its advantageous proximity to Cairo and substantial investments. The city's proximity to the capital offers residents convenient access to urban amenities while residing in a quieter urban environment. Moreover, the influx of investments, likely driven by its strategic location, has accelerated infrastructure development, making it an attractive destination for both residents and businesses.

The graph depicting annual population growth in the desert cities around Cairo reveals intriguing insights into the dynamics of urbanization and development. Smaller cities appear to leverage their size and attract higher population growth rates. Sheikh Zayed desert city's small size and gated communities contribute to its remarkable growth, while New Cairo desert city's proximity to Cairo and substantial investments explain its exceptional growth despite its size. This analysis underscores the complex interplay of factors that influence population dynamics and urban expansion in these desert cities.

After covering the desert cities around Greater Cairo over the last four decades, one can see that these massive investments, resources and time invested did not attract the targeted population. The number of vacant units around Cairo's desert cities is still very high; it reflects the decision-making process in tackling one of Egypt's most critical problems.

Also, corruption in the decision-making process is one of Egypt's pandemic problems that have stopped the country from achieving the expected milestones over the last decades. It illustrated how the urban environment around Greater Cairo's deserts took place and how ineffective the policies were in attracting the target number of populations. Unfortunately, the number of attracted inhabitants is only a fraction of the target, most of whom are car owners.

Ineffective accountability in the decision-making and implementation seems like another critical factor that did not allow the State to achieve its aims. The case study of New Cairo City is the best example that illustrates the ineffectiveness of the planning authorities and the lack of accountability. By creating a structural system that controls all different authorities and brings public opinion to the drawing table, there is a better chance for achieving sustainable cities that targets our social, physical, financial and daily needs.

Masterplans of most cities are almost the same. Inappropriate symbolism, symmetry, copy-paste urbanism, segregation of services, low density, fenced neighbourhoods, mono-functionality and unusable public space are all common properties in privately or publicly developed urban environments. Also, top-down urban planning and design seem to take place in all urban developments. As a result, a clear gap exists between the design and what is needed by inhabitants. Bottom-up initiatives are abandoned across all desert cities around Cairo, and "informality" is strictly forbidden.

Interviews and Insights:

In 2021, interviews were undertaken to assess the living conditions and perceptions of residents in Cairo's eight desert cities. The study revolved around the themes of accessibility, affordability, job opportunities, services, public spaces, housing typologies, education, healthcare, and technical infrastructure. This text delves into the details of the interviews conducted, the evaluation process, and the insights derived.

Interview Methodology:

The investigation encompassed interviews with 26 individuals residing in various desert cities. The sample size aimed to encompass a diverse range of perspectives, capturing a well-rounded understanding of the living conditions. The interviews were conducted through a mix of methods, including phone, video calls, and on-site visits. This approach allowed for a comprehensive exploration of personal opinions, experiences, and preferences.

Evaluation Criteria:

The 26 interviewees were asked to rate specific aspects of their desert city living experience on a scale of 1 to 10, with 1 representing poor and 10 reflecting excellence. The evaluation encompassed crucial aspects of daily life, addressing the following core questions:

Accessibility: This dimension assessed the convenience of reaching and moving within the desert city. It also took into account the quality of public transportation and the commuting time to Cairo.

Affordability: The affordability of residential and commercial properties in comparison to Cairo's prices was examined, providing insights into the economic viability of living in desert cities.

Job Opportunities: This factor gauged the availability and diversity of job opportunities within each desert city, shedding light on the employment conditions.

Services: Accessibility and diversity of services were surveyed, elucidating the quality and availability of essential amenities.

Usable Public Spaces: The quality of public spaces, including landscape and shaded areas, was assessed to understand the recreational and social dimensions of desert city living.

Housing Typologies: Diversity in housing units, encompassing size and architectural layouts, was evaluated to determine the variety of housing options.

Educational/Healthcare Facilities: Quality, accessibility, and the balance between residential units and educational/healthcare facilities were examined in each desert city. **Infrastructure:** The evaluation extended to technical infrastructures like water, electricity, gas, and internet services, providing insights into the quality of daily utilities.

Insights and Limitations:

The interviews and subsequent evaluations yielded valuable insights into the nuances of desert city living. However, it's important to acknowledge that while the interviews with locals provided qualitative depth, the statistical impact of the interviews was limited due to the relatively small sample size. While individual experiences and opinions were captured, these might not be entirely representative of the entire population.

The interviews shed light on various dimensions of living in Cairo's desert cities. The interviews, combined with the structured evaluation, contributed to an understanding of the challenges of desert city living. It is worth considering that this study provides a snapshot in time, and ongoing assessments could offer a more comprehensive picture of the evolution of desert cities and the experiences of their residents.

Desert City	Area of New Town as of 2009	Construc. Year	GOOP Population Estimate 2005	Census Population 2006	Census Population 2014	2006 Census % of Deserted Housing Units	Accessibility	Affordability	Job Opportunities	Services	Usable Public Spaces	Different Housing Typologies	Educational / Healthcare Facilities	Infrastructure (Water, Electricity & Internet)	Success Rate
10th of Ramadan	208 km ³	1977	500.000	124.120	430.000	42 %	4/10	8/10	8/10	7/10	2/10	3/10	4/10	6/10	6/10
15th of May	16 km ³	1978	180.000	90.324	200.00	35 %	8/10	8/10	3/10	5/10	1/10	3/10	3/10	7/10	6/10
6th of October	413 km ³	1981	500.000	157.135	1.350.000	63 %	6/10	5/10	6/10	9/10	3/10	8/10	7/10	8/10	7/10
Badr	52 km ³	1982	60.000	17.172	85.000	71 %	4/10	7/10	3/10	3/10	1/10	4/10	2/10	5/10	4/10
UJ-Ubur	54 km ³	1988	100.000	43.802	300.000	64 %	8/10	7/10	5/10	6/10	2/10	3/10	4/10	8/10	6/10
Al-Shuruq	42 km ³	1995	62.000	20.983	170.000	79 %	4/10	4/10	2/10	4/10	2/10	6/10	4/10	6/10	3/10
Sheikh Zayed	38 km ³	1995	48.000	29.553	233.000	69 %	5/10	2/10	2/10	5/10	4/10	5/10	3/10	7/10	6/10
New Cairo	351 km ³	2000	302.000	118.678	1.200.000	64 %	6/10	3/10	7/10	9/10	3/10	8/10	8/10	7/10	7/10

Table 62 Survey from Residents. Source: Interviews by Author in 2021

Facts about desert cities around Cairo. Source: Arab Republic of Egypt. Al-Jihaz al-Markazi lil-Ta'bi'a al-'Amm wal-Ihsa'. Al-Ta'dad al-'am lil-Sukkan wal-iskan wal-munsa'at (Census of Egypt) various years; for areas of new town concessions, calculated from GOPP and Google Earth. By: David Sims.) Modified/ Table by Author

Chapter 3

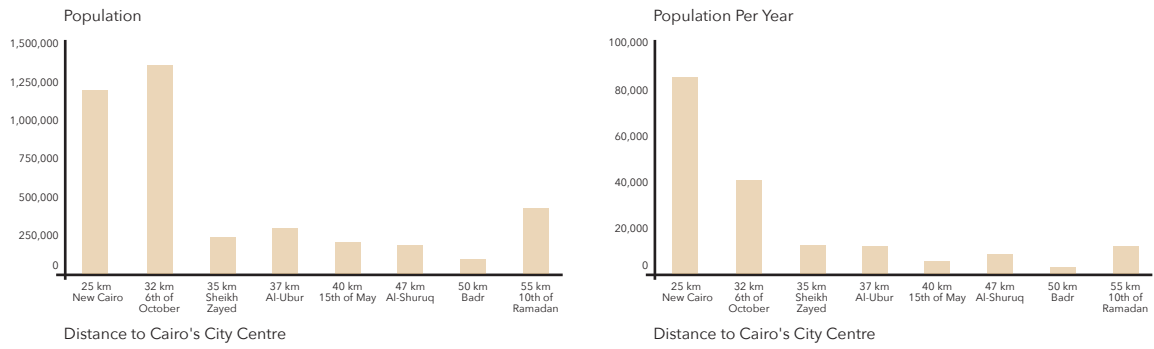


Figure 63 Attracted Population in Relation to Distance to Cairo's City Centre, Graph by Author

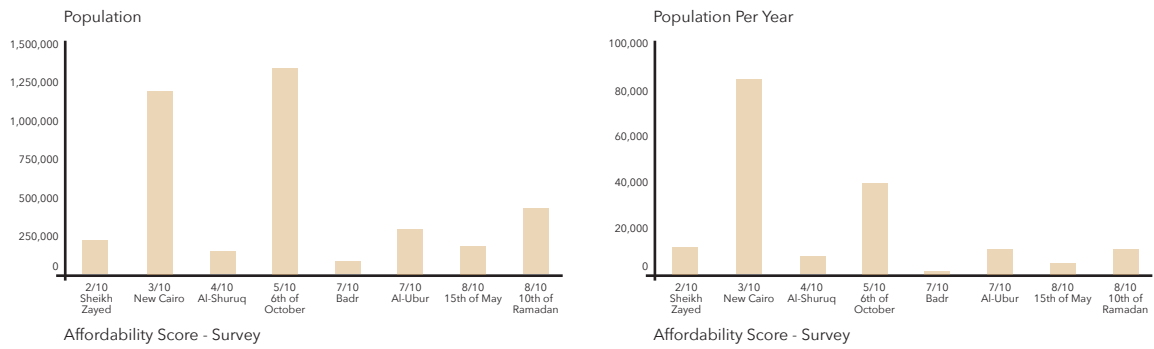


Figure 64 Attracted Population in Relation to Affordability, Graph by Author

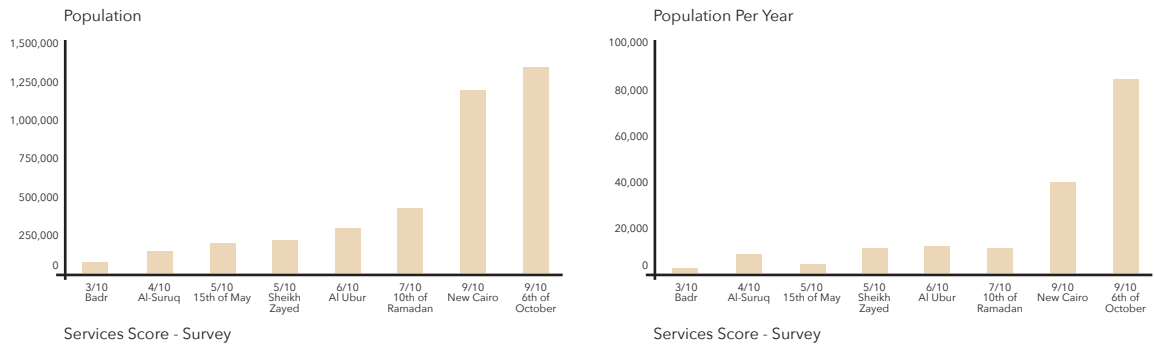


Figure 65 Attracted Population in Relation to Services, Graph by Author

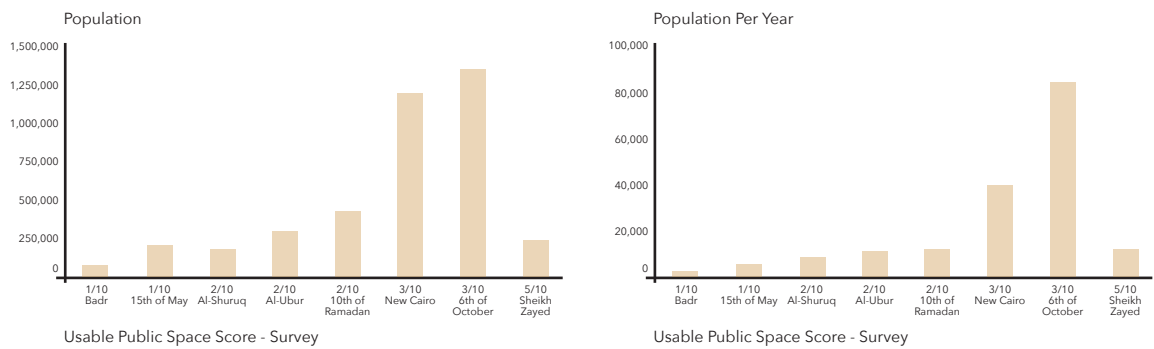


Figure 66 Attracted Population in Relation to Usable Public Space, Graph by Author

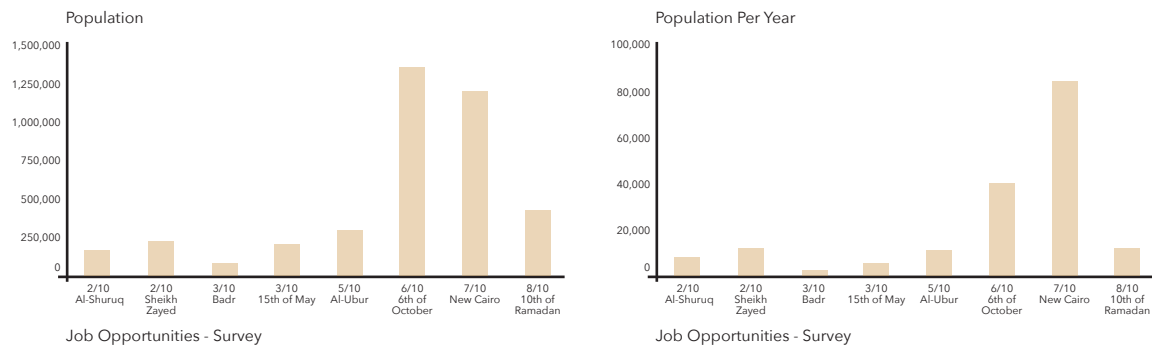


Figure 67 Attracted Population in Relation to Job Opportunities, Graph by Author

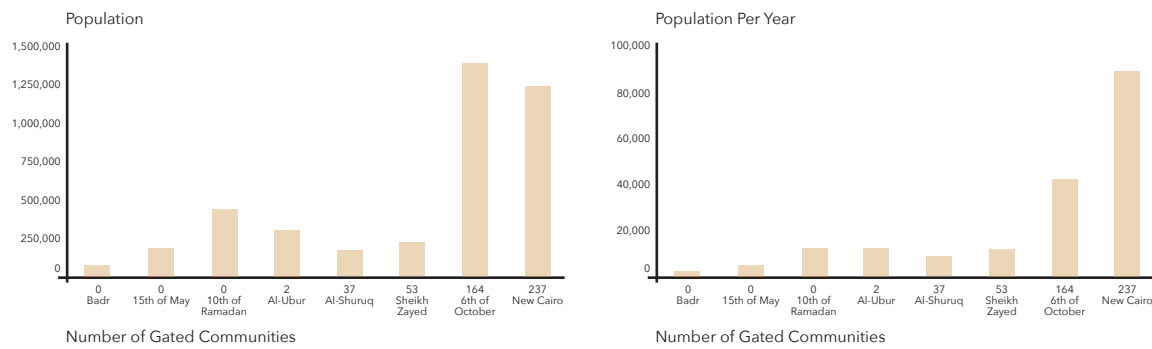


Figure 68 Attracted Population in Relation to Number of Gated Communities, Graph by Author

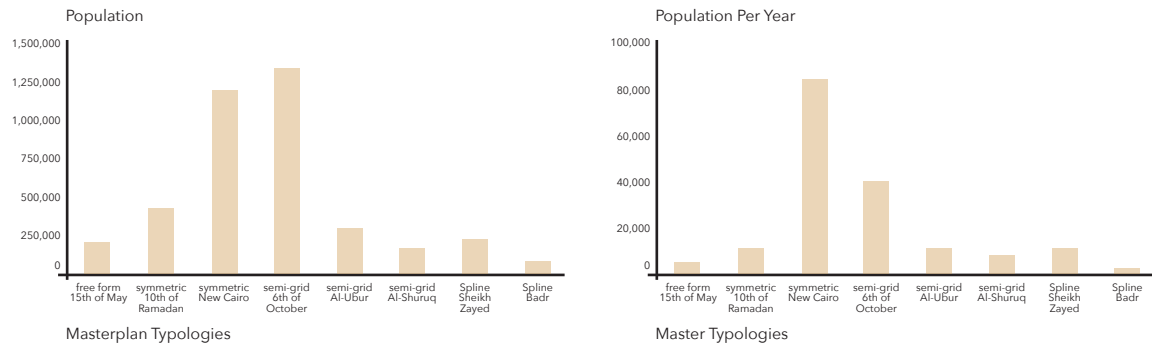


Figure 69 Attracted Population in Relation to Masterplan Typologies, Graph by Author

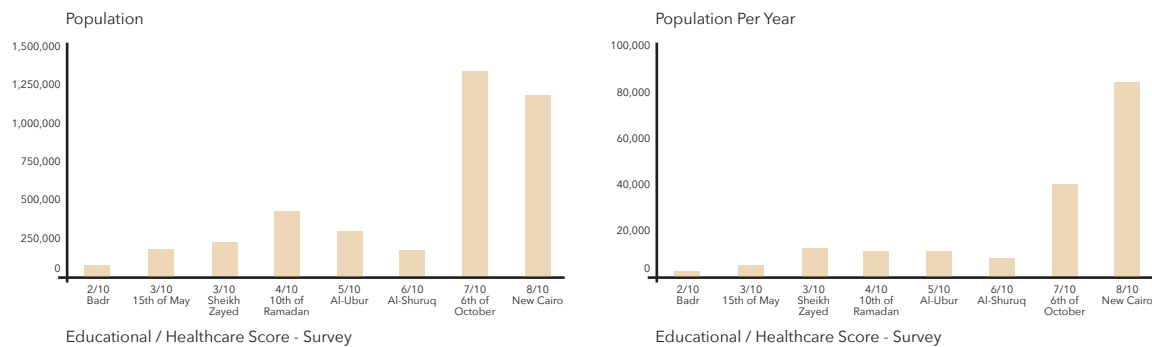


Figure 70 Attracted Population in Relation to Education and Healthcare, Graph by Author

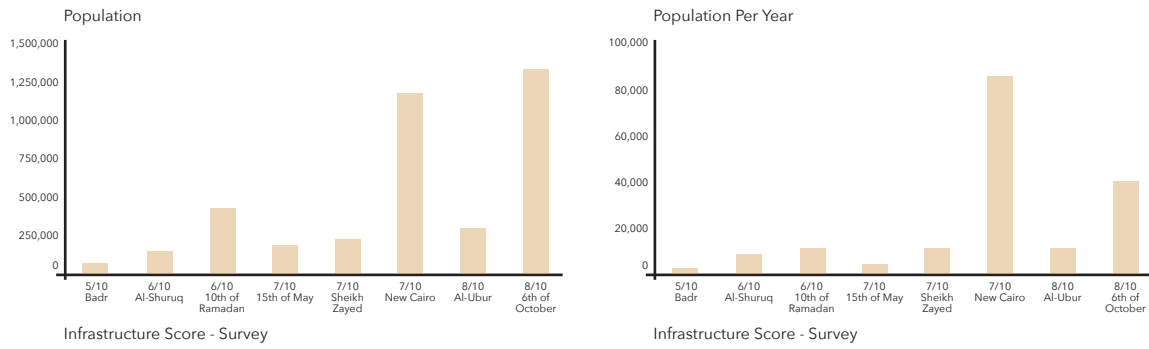


Figure 71 Attracted Population in Relation to Infrastructure, Graph by Author

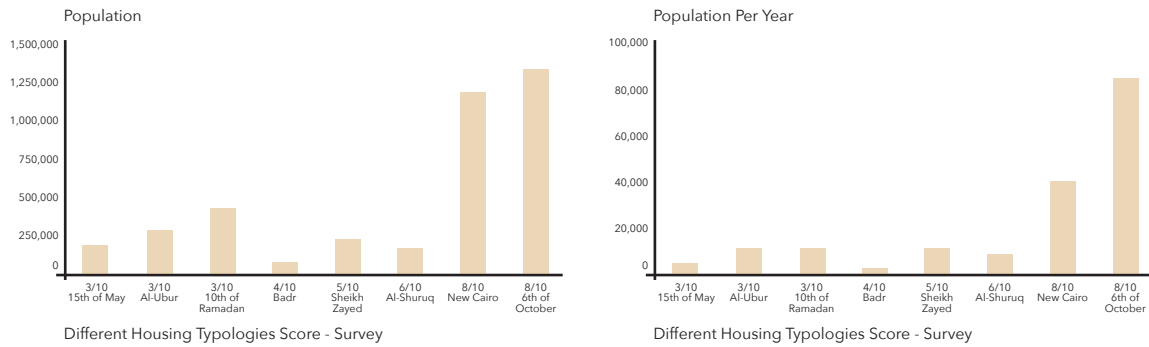


Figure 72 Attracted Population in Relation to Different Housing Typologies, Graph by Author

SUMMARIZING THE STATISTICS

1. Short Distance to Cairo is directly related to the success and failure of the new desert cities. Cities like New Cairo and the 6th of October have attracted over 1 million inhabitants each. Although all desert cities were planned to become self-sufficient, the graphs show that the proximity to Cairo is still fundamental to attracting residents and businesses.
2. Cities with the highest success rates are the cities that are not necessarily affordable, where many inhabitants live in gated communities, own more than one vehicle and are reasonably flexible with mobility.
3. Services play a fundamental role in attracting new residents, investments and businesses. Therefore, cities with the highest quality of service delivery succeeded in attracting the most considerable portion of Egyptians. That reflects the importance of creating a physical environment that does not only target housing units but many facilities to generate successful living urbanism.

4. Although the quality of usable public space is relatively similar in all desert cities, cities with a higher score in the usable-public space survey have attracted more residents over the years. Usable-public areas in these cities mainly tend to be in gated communities with high maintenance and services. On the other hand, usable public spaces in other towns rarely take place.

5. Job opportunities have succeeded in attracting many inhabitants to the new desert cities, yet, the 10th of Ramadan city has a robust industrial base that did not attract that many residents as targeted. Workers and employees of the 10th of Ramadan have commuted daily to the industrial city and left many of its housing units deserted. Therefore, new residents will not necessarily house the new urban environment by creating only job opportunities and dismissing other fundamental urban facilities.

6. The number of gated communities to the attracted population reflects a direct relationship. As the number of gated communities increases, the number of residents increases. Conversely, desert cities with no gated communities have the least number of residents. Probably, as gated community residents have financial resources and each family owns more than one automobile, they are flexible with transportation and can access services easily.

7. Most of the Masterplans of the desert cities around Cairo are relatively similar. It is hard to tell if the Masterplan typology played a critical role in the success or failure of the desert cities. Although symmetric and Semi-grid Masterplans had the highest number of inhabitants, they were not much different from the rest of the Masterplans with wide streets, segregation of urban facilities, zonings, and low density.

8. The population increases as the quality of education and healthcare increases in desert cities. Those two services play a fundamental role as car owners and non-car owners find it critical to live close to education and healthcare facilities.

9. The relationship between urban technical infrastructure and the attracted population was hard to understand. Cities that had better infrastructure did not necessarily have a higher population. Probably, other factors are more critical for Egyptians to make them move to a new living environment. "Informal" settlements have a very modest technical infrastructure yet have attracted many Egyptians in Cairo. Therefore, the technical infrastructure is not the main feature to attract Egyptians to an urban environment.

10. By having a wider variety of housing typologies, a spectrum of people are attracted to the new desert cities. Cities like New Cairo and the 6th of October have diverse housing units, from gated communities to affordable social housing. Therefore, they have succeeded in attracting over 2.5 million inhabitants together.

The lack of success in Greater Cairo's Deserted Cities despite a critical housing shortage in Cairo is evident. At the same time, there is ongoing population growth. However, discussing various factors that created that problem is fundamental.

In analogy to the impact of fundamental physical forces, explanations often resort to "push and pull" factors to clarify mobility flows. I.S. Lowry employed the gravitational analogy in his 1964 Model of Metropolis, using the ratio of mass and distance to explain attractive forces and calculate the likelihood of allocating inhabitants to different regions.

In the context of Desert Cities, what constitutes the "mass" generating attraction is not primarily the housing supply. A comparative study of these cities reveals significant differences in growth rates, achievement of target numbers, and the availability of housing typologies.

The assumption was that by investigating the causes behind this varying success, the crucial factors influencing attractiveness or lack thereof became evident. In essence, comparing characteristics of the least and most successful examples could uncover tendencies and prerequisites for creating new urban environments.

The data for this comparative, initially quantitative study included objectively given or measurable characteristics such as location in the region, population development, growth rate, and accessibility. Additionally, subjective assessments of the attractiveness of residents were collected through interviews with locals.

These characteristics were graphically presented in graphs to illustrate correlations and reciprocal relationships. Correlation calculations were not employed due to the relatively small number of components and attributes. This quantitative aspect of the study was designed to complement the qualitative analysis.

It became evident that explanations couldn't be solely derived from the aggregated quantitative aspects. For instance, the presence of gated communities in Desert Cities, regardless of distance, proved attractive to specific individuals, provided they owned a car and had a corresponding income. Conversely, a substantial supply of the social housing sector lacked a strong attraction effect if accessibility was poor and the occurring social and urban environments were weak. Therefore, the comparative study must delve into detailed content analysis to extract interrelationships in the emergence of push and pull factors.

1 "Population Growth (Annual %) - Egypt, Arab Rep." Data, <https://data.worldbank.org/indicator/SP.POP.GROW?end=2020&locations=EG&start=2020&view=bar&year=2020>.

2 Midolo2019-03-08T00:00:00 00:00, Emanuele. "Inside Egypt's New Capital." Property Week, 8 Mar. 2019, <https://www.propertyweek.com/insight/inside-egypts-new-capital/5101721.article>.

3 Midolo2019-03-08T00:00:00 00:00, Emanuele. "Inside Egypt's New Capital." Property Week, 8 Mar. 2019, <https://www.propertyweek.com/insight/inside-egypts-new-capital/5101721.article>.

4 "New Cities in the Sand: inside Egypt's Dream to Conquer the Desert." The Guardian, Guardian News and Media, 10 July 2019, <https://www.theguardian.com/cities/2019/jul/10/new-cities-in-the-sand-inside-egypts-dream-to-conquer-the-desert>.

5 Denis, „Cairo as Neoliberal Capital?," 49.

6 Because one of the new towns, Fifteenth of May, is a grafting onto a part of existing Cairo rather than a geographically independent unit, it can be considered a simple urban extension to the metropolis rather than a new town per se. Another, Tenth of Ramadan New Town, is so remote from the Cairo agglomeration that it is functionally separate from Greater Cairo. Thus, were these two cities to be excluded from the list of new towns that form part of Greater Cairo, then the new towns' combined demographic weight within the metropolis would be even less than what was recorded by the Census of Egypt 2006, that is, down to 2.4 percent from an already feeble 3.7 percent.

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8 Government planners seem to have a penchant for odd angles for the layout of road intersections and public housing blocks, thirty and sixty degrees being preferred. This results in a lot of awkward and unusable land segments, which, for lack of any better solution, are designated for yet more open space and, on plans at least, are verdant. A simple grid layout of streets, by far the most efficient, is rarely adopted in the new towns.

9 All of the new towns around Cairo are located on elevated desert plateaus where no shallow water tables exist, thus even hardy indigenous palm trees cannot survive without continuous watering. Even worse, most water consumed in the new towns, both for irrigation and for urban use, is lost forever since the desert locations are far from the Nile Valley and do not recharge the underground Nile Valley aquifers.

10 Very early on, in 1982, a NUCA announcement called on investors to purchase industrial plots in Sixth of October for LE20 a square meter, requiring a 25 percent down

payment (printed announcement from NUCA dated 27 November 1982).

11 Madbouli, „Background Paper on Urban Planning,” 60.

12 David Sims, *Understanding Cairo, The Logic Of A City Out Of Control*, Chapter 6

13 Home - About the Authority, www.newcities.gov.eg/english/aboutUs/About_Authority/default.aspx.

14 For those who are unfamiliar with Egypt’s recent history, it should be pointed out that the sixth of October commemorates the start of the war with Israel to liberate Sinai in October 1973. Tenth of Ramadan is that same date according to the Islamic calendar. Fifteenth of May commemorates Sadat’s ‚corrective revolution’ of 1972.

15 For those who are unfamiliar with Egypt’s recent history, it should be pointed out that the sixth of October commemorates the start of the war with Israel to liberate Sinai in October 1973. Tenth of Ramadan is that same date according to the Islamic calendar. Fifteenth of May commemorates Sadat’s ‚corrective revolution’ of 1972.

16 Home - About the Authority, www.newcities.gov.eg/english/aboutUs/About_Authority/default.aspx.

17 Home - About the Authority, www.newcities.gov.eg/english/aboutUs/About_Authority/default.aspx.

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24 If Sheikh Zayed New Town is considered part of Sixth of October, the combined 2006 population rises to 187,000 inhabitants.

25 The Census of Buildings includes, in its dwelling unit count, units that may be unfinished, and thus vacancy rates throughout urban Egypt seem high (averaging almost 30 percent for Greater Cairo as a whole). Even so, the vacancy rates in Sixth of October and in other new towns around Cairo are remarkably high.

26 Media Production City, or ‚Hollywood East,’ obtained a large site along the southern entrance to Sixth of October. The land was assigned at no cost to the Ministry of Information, which then created a joint venture with private capital to provide film and television studios and support services. The land value was calculated as the ministry’s (controlling) share in the joint venture.

27 Home - About the Authority, www.newcities.gov.eg/english/aboutUs/About_Authority/default.aspx.

28 Home - About the Authority, www.newcities.gov.eg/english/aboutUs/About_Authority/default.aspx.

29 GTZ's three-year exercise is an interesting side story. At considerable expense, attempts were made to introduce a sites-and-services approach for residential neighborhoods with the aim of attracting the informal housing dynamic to aliUbur, which included detailed layouts of small plots and semi-public spaces and simple building regulations.

30 Home - About the Authority, www.newcities.gov.eg/english/aboutUs/About_Authority/default.aspx.

31 David Sims, Understanding Cairo, The Logic Of A City Out Of Control, Chapter 6

32 David Sims, Understanding Cairo, The Logic Of A City Out Of Control, Chapter 6

33 Interviews made by Author: Mostafa Aboughaly in 2020-2021

34 Home - About the Authority, www.newcities.gov.eg/english/aboutUs/About_Authority/default.aspx.

35 Home - About the Authority, www.newcities.gov.eg/english/aboutUs/About_Authority/default.aspx.

36 The Extension of Municipal Services project, a study financed by the World Bank, aimed to create expansion zones for poorer inhabitants in the deserts both east and west of Cairo, with extensive use of sites and services zones to attract the informal housing dynamic. See also Chapter 4.

37 David Sims, Understanding Cairo, The Logic Of A City Out Of Control, Chapter 6

38 Interviews done by Author in 2021.

39 Home - About the Authority, www.newcities.gov.eg/english/aboutUs/About_Authority/default.aspx.

40 Home - About the Authority, www.newcities.gov.eg/english/aboutUs/About_Authority/default.aspx.

41 David Sims, Understanding Cairo, The Logic Of A City Out Of Control, Chapter 6

42 David Sims, Understanding Cairo, The Logic Of A City Out Of Control, Chapter 6

43 David Sims, Understanding Cairo, The Logic Of A City Out Of Control, Chapter 6

44 David Sims, Understanding Cairo, The Logic Of A City Out Of Control, Chapter 6

45 David Sims, Understanding Cairo, The Logic Of A City Out Of Control, Chapter 6

46 David Sims, Understanding Cairo, The Logic Of A City Out Of Control, Chapter 6

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حدائق مدينة















CHAPTER 4 DELVING INTO THREE DIFFERENT DESERT CITIES IN DETAIL

NEW ADMINISTRATIVE CAPITAL

The building of Egypt's New Administrative Capital contributed to critical controversy due to its need and the adequacy of its development. Three models of reasoning have arisen regarding this topic within the planning fields. The first supports the decision to create a new capital city in that selected location. The second opinion recognises the notion of building a new administrative city, yet its location is questionable. Finally, the third view strongly does not support building a new capital city from scratch.

In 2015, a plan to build a New Administrative Capital was announced. Construction has been taking place since 2017, with a selected site about 45 kilometres east of Cairo. This decision sparked controversy.

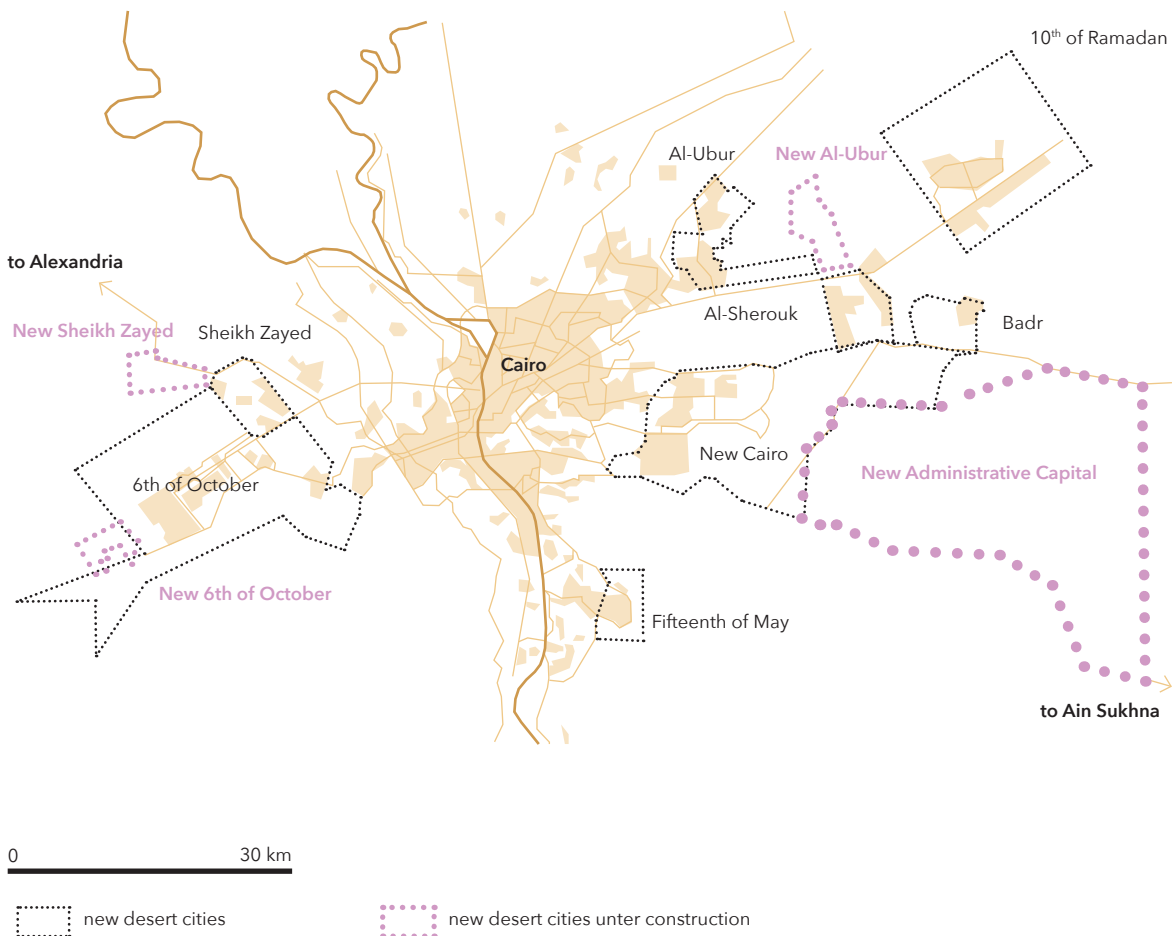


Figure 1 Desert Cities around Cairo. Drawing by Author

The city aims to accommodate 7 million residents, occupying a gross area of 700 square kilometres and is thus more extensive than Washington, DC. The project will include metro lines linking Cairo and Suez to the city. In addition, it has a road network of 250 km in the city. The scheme hosts more than 600 health and education services and an international airport with an area of about 15 km², extending over the Cairo airport and other nearby airports. A regional park will be for recreation and 90 km² for solar farms. The New Administrative Capital will host the new governmental institutions, and different ministries will take place as well as many international embassies.¹

A financial and commercial centre for various businesses and companies will also occur. Other parts of the city will host local and foreign institutions, including universities, leisure venues, soccer grounds, galleries, and international hotel chains. The cost of constructing the new capital will reach US\$ 46 billion. The project estimates to create around 1,5 million job opportunities.²

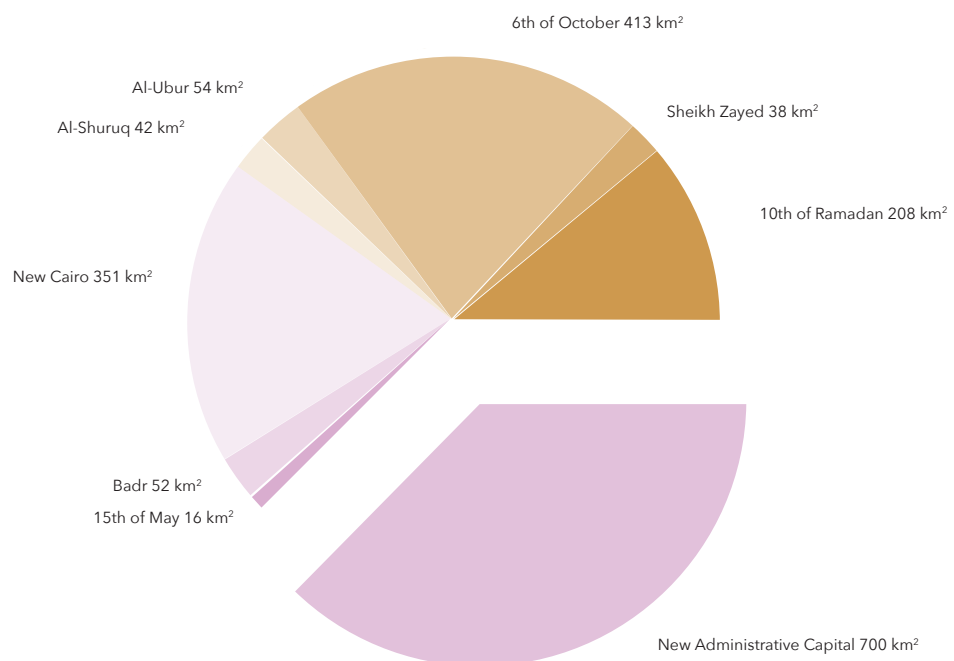


Figure 2 New Administrative Capital total area compared to the rest of the Desert Cities around Cairo. Source: NUCA. Graph by Author

THE OPINION AGAINST BUILDING THE NAC

There were striking changes in the proportion of poor citizens in the Egyptian regions from poverty figures revealed for 2012/2013 (according to the IMF). The southern provinces of Egypt have the most significant proportion of poverty, from 55% to 60% of the total population. That led to an increase in the pattern of internal immigration in Egypt, where they migrated to Cairo. In recent decades, these trends have increased, with many alarming records since the 1990s.³

In 2006, the UN outlined this with the phrase: "Cities are magnets of hope," where people from poverty migrate to developed towns in search of better living conditions.⁴ For example, nearly 25% of Egyptians live in Greater Cairo, which receives a significant proportion of the annual investments, while smaller investments go to other cities and regions in Egypt.

In this context, it is also critical that investments and resources are spread equally and fairly through all Egyptian regions to offer benefits and employment opportunities in other areas to slow the population growth in Greater Cairo.

THE OPINION THAT SUPPORTS BUILDING THE NAC IN A DIFFERENT LOCATION

Several urban planners and architects agree that the construction of a new capital city should serve as a new hub, stimulating development and attracting investments, activities and new residents, but this should take place in an under-populated area or an area suffering from regional poverty and inequality. Moreover, building a new city is one of the spatial planning deconcentration techniques. These policies aim to decentralise people and detach them from congested centres. Therefore, constructing a new capital would function better as a development pole in a peripheral area that needs urbanisation.⁵

Urban observers claim this idea would have been similar to the Brazilian experience from the 1960s if it had taken place in a new region. Instead, Brasilia was designed to catalyse the entire region's growth in an undeveloped and marginalised area of about 1,200 kilometres from the old capital. Concerning the New Administrative Capital in Egypt, the location chosen is 45 kilometres from Cairo, thus forming a super agglomeration in this area, where the urban sprawl grows towards the east.⁶

Concerning infrastructure networks, the development of the New Capital would negatively impact several infrastructures, affecting the infrastructure of larger communities, either satellite towns or the suburbs of Cairo, such as New Cairo and al-Shorouk City. These communities are reportedly struggling with regular water shortages. As the Nile River is the predominant water source, the challenging factor is its low elevation, where the new cities in the east are relatively higher than the Nile. To have a sufficient water supply to these areas pumping stations and extensive pipelines are required. As Egypt is about to enter into an era of water scarcity due to the Renaissance dam in Ethiopia, how will the New Capital get its water? How will the State move water 70 km from the Nile?

THE OPINION THAT SUPPORTS BUILDING THE NAC

If that strategy succeeds, Egypt should join a group of countries that have moved their capital city effectively over the years. One example is Brazil, which planned the new capital city of Brasilia in 1961. Brasilia underwent rapid growth and globalisation after establishing itself as the modern capital of Brazil. The case of Brazil has encouraged other countries to pursue similar solutions to the well-known overcrowding problem.⁷

Also, Indonesia announced that it plans to move its administration government from the capital city of Jakarta to an area with less flood. Similarly, the Philippines has begun constructing a new city called New Clark City.

The other countries that changed their capital cities in the 1960s and later are Belize, Tanzania, Ivory Coast, and Burma. Russia is an older example. During Russia's empire from the 14th century to 1712, it retained Moscow as its Capital city. St. Petersburg was declared the capital of Russia to reinforce relations with Europe before Moscow restored its title in 1918.⁸

The Egyptian government will move the parliament and other government buildings to the New Administrative Capital city. With nearly 25 million inhabitants living in Greater Cairo, the city faces numerous problems like traffic congestion, overcrowding and pollution – concerns that the State hopes the New Administrative Capital could solve. Moving the government to the New Administrative Capital City might trigger fundamental activities. Acting as a catalyst of change would bring development, create job opportunities and helps absorb the growing Egyptian population. Although it is a risk to be taken, moving the government might attract residents to the New Administrative Capital quickly and reduce the risk of creating a new deserted city.



Figure 3 The New Egyptian Parliament in the New Administrative Capital. Source: The Spokesmen of the Egyptian Presidency

Highways were built to connect the site in 2015, only a few months after the announcement of the New Capital City. The construction began in 2016-2017 and continued at a very high speed. Phase zero included constructing a new government quarter to serve 34 ministries of the Government of Egypt that will move there over a few months. In addition, the presidential residence, high court, central bank and stock exchange will move to the New Administrative Capital. "The district is the economic catalyst for the entire project," says Daniel Horner, Head of Strategic Planning at Dar Group in London, which manages project implementation.⁹

*"The challenge of any new city is to stimulate growth; to get people to live there," says Horner from DAR Group Architects, which designed the NAC. "Moving the ministries is a very clever idea. It acts as a Kickstarter."*¹⁰ The State built more than 20,000 units across three residential districts for the first batch of around 50,000 government employees expected to move to the New Administrative Capital in 2022. Also, many residential units are newly built to accommodate the new employees of the New Administrative Capital.¹¹

David Sims, the author of Egypt's Desert Dreams, said that the backing of the President and the military made the project "too big to fail," even though he can not guarantee that new residents would like to settle there. "It is one thing to have an army of labourers and lots of machinery out there pushing dirt around, but it will be another thing to see if it all comes together," he said.¹²



Figure 4 President El-Sisi checking the New Administrative Capital with military generals in 2021. Source: The Spokesmen of the Egyptian Presidency

ANALYSING THE NEW ADMINISTRATIVE CAPITAL

1. THE URBAN LAYOUT AND MASTERPLAN

The urban design of the New Administrative Capital is different from all previous desert cities of the past. As the city is part of the fourth-generation towns, the State tries to market it as a sustainable and technologically advanced city. The Masterplan represents a large green park in the middle of the desert, splitting the city into two parts - North and South.

This Green park aims at connecting the city by devolving each zone into smaller green parks. Although the Masterplans present the park as a connector catalyst to all zones, it is questionable how this concept would function with the large amounts of gated communities in the New Administrative Capital. Also, the Masterplan markets the city as a green oasis in the middle of the desert, while water sources remain unclear.



Figure 5 The Masterplan of the NUC. Source: Kamaly, Asmaa. "The Construction of the 35-Km Green River in the Egyptian New Administrative Capital." World Architecture Community, World Architecture Community, 17 June 2019, worldarchitecture.org/article-links/eccvp

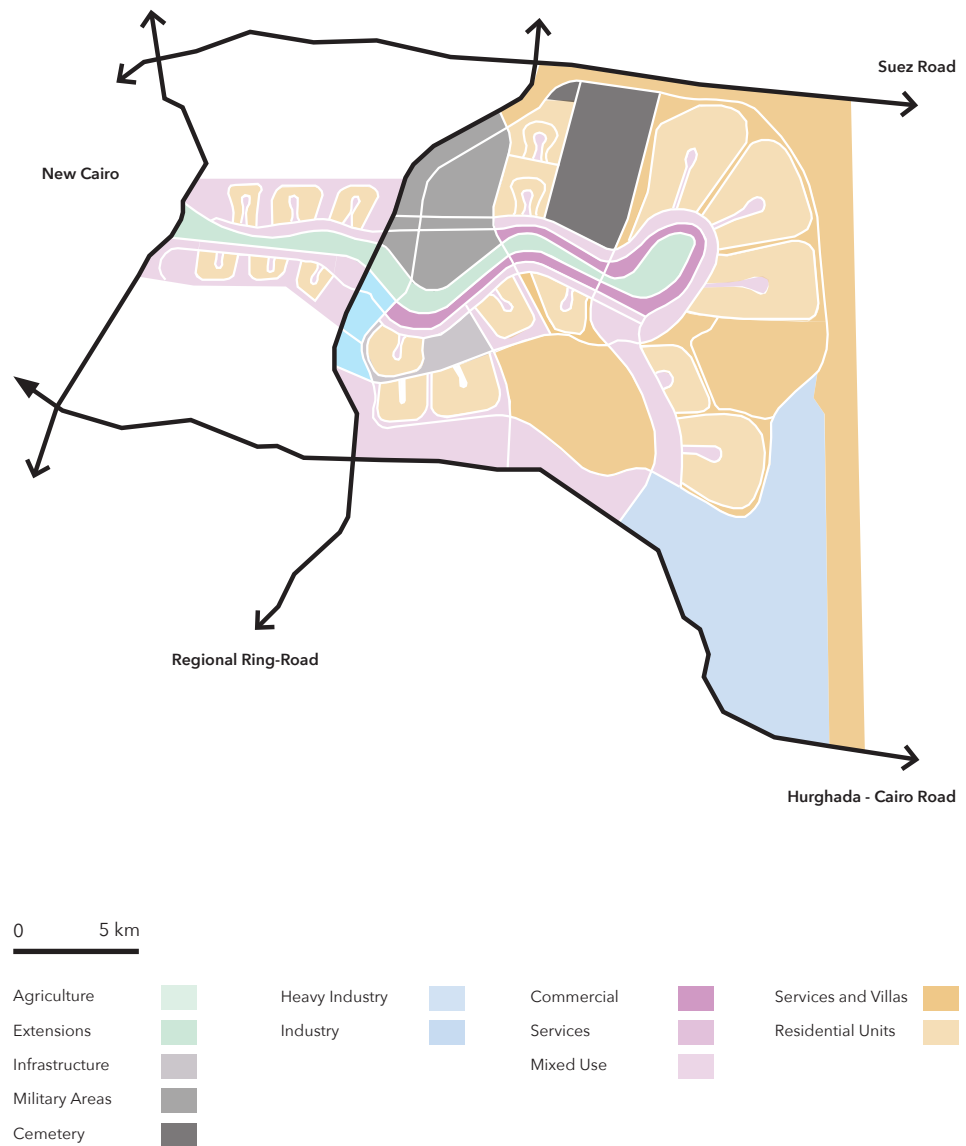


Figure 6 Zoning of the New Administrative Capital. Drawing by Author

2. DENSITY AND STREETS

Low-density neighbourhoods and broad streets were the main characters of the fourth-generation cities around Cairo. The State has designed them like that as it believes they tackle congestion problems. In New Cairo City, the State has built 90 meters wide streets to accommodate more cars, thinking that that would solve the congestion problem.



Figure 7 Roads in the New Administrative Capital. Source: "Egypt Revives Dream of New Desert Capital." Saudi-gazette, NEWSPAPER_NAME, 12 Dec. 2017, saudigazette.com.sa/article/523976.

The density of the urban environment plays a substantial role in influencing the urban environment's qualities. For example, in hot climate conditions, shaded spaces influence pedestrian activities and the temperature inside the city. Therefore, planning the correct density of buildings allows us to use the land more wisely. Unfortunately, urban density in NAC is very low, where the State plan to house seven million inhabitants on 700 square kilometres; 100 square kilometres for every million inhabitants. Cairo, on the other hand, houses over 20 million inhabitants on 17,267.6 square kilometres.¹³

When analysing the old Madina structure of Marrakesh or Islamic Cairo, that typology has created density, which has triggered rich public activities in the streets, created excellent work-live proximity, shaded public spaces and created cooler temperatures. From these case studies, one can learn that the urban environment's density could trigger sustainable mobility, as density supports inhabitants to use more bicycles and make people less dependent on cars.



Figure 8 Marrakesh Medina Urban Fabric from above. Source: Darrin Jenkins



Figure 9 R3 residential area in the New Administrative Capital. Source: Azmat. "#R3 Residential District: U/C." SkyscraperCity, 27 Dec. 2020, www.skyscrapercity.com/threads/r3-residential-district-u-c.2083145/.



Figure 10 The R3 (North) Residential Neighbourhood, Solid and Void. Drawing by Author

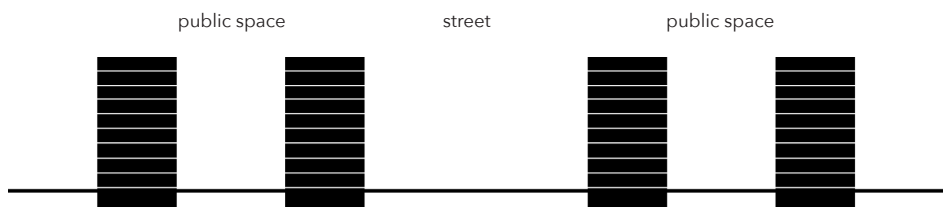


Figure 11 Section Diagram in R3 (North) Residential Neighbourhood. Drawing by Author

The Section diagram and the Solid and Void diagram represent the density and the typology of the R3 neighbourhood. Although its density is denser than the gated communities around Greater Cairo, it is still low compared to Cairo's neighbourhoods. The Section diagram also represents the underground parking level that takes place under the high residential dwellings (a new artefact to the desert cities), reducing the secondary streets' size compared to other desert cities. On the other hand, the Section diagram in the Business District represents a new typology to Greater Cairo, with Dubai-like skyscrapers dispersed across linear axes, forming high density through sheer bigness.

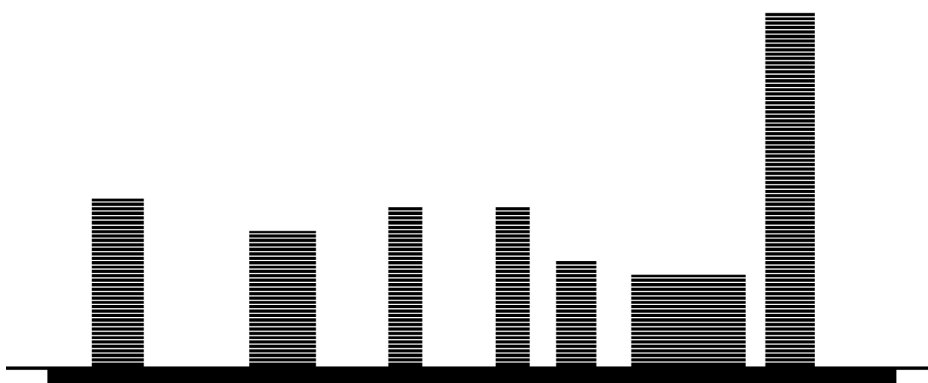


Figure 12 Section Diagram in the Business District. Drawing by Author

3. OPEN SPACES AND GREENERY

The Masterplan of the city includes 35 km of a "Green River" public space for pedestrians. The State argues that Egyptian cities lack green areas and that the New Administrative Capital should be a new model of Egyptian cities, offering more green spaces.

Although this idea seems convincing in many countries, constructing a 35 km park in the middle of the desert would need large amounts of water. On the other hand, if the State plans to create a better pedestrian atmosphere in the town, the city's scale should be much smaller and less car-independent, with more density and a better-connected micro-mobility.



Figure 13 The Green River in the New Administrative Capital. Source: NUCA

4. HOUSING

The State plans to move many government employees to the city by 2022. However, one urban development expert in Cairo, who wishes not to be identified, says that a small proportion of the number is the 50,000 government workers relocating to the new capital.¹⁴ "Egypt has one of the world's largest civil services, with around five million government employees," and "There are 2,1 million government workers in Cairo alone; therefore most of them will not move."¹⁵

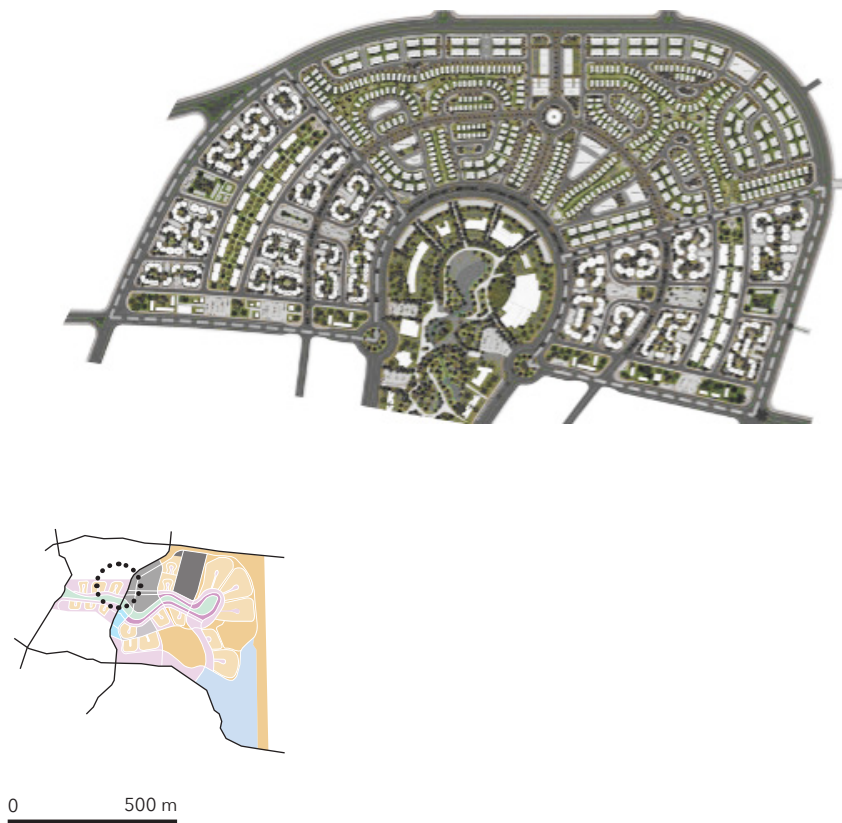


Figure 14 The R3 (North) Residential Neighbourhood Masterplan. Source: "Al Maqsad Residences New Capital by City Edge." Real Estate Egypt, realestate.eg/en/4626-residential-in-new-administrative-capital-al-maqsad-residence-compound.

R3 (North) residential neighbourhood is one of the typical residential models in the New Administrative Capital. The "Green Park" extends to the neighbourhood's core, bringing some mixed-uses to the area. The remaining zones host only residential units, from villas to high residential dwellings. Its scale is relatively large (3 km²), so it is doubtful if it will attract people to walk in their neighbourhood for their daily needs. Although the central area supports the district with mixed-uses, over 80% of the neighbourhood remains residential and mono-functional.

One of the main aspects that the State has not changed while designing the fourth-generation cities is the typology of the housing units. In the New Administrative Capital, most planned residential typologies are replicas of the older generation of new cities. Their facades have different designs, yet, their floor-plan distribution is similar to the previous typologies.

The residential typologies of the New Administrative Capital are mostly solitaire buildings from two-storey villas to ten-storey dwellings. The villas are identical to villas built in New Cairo city and the rest of the desert cities. The ten-storey residential buildings are built differently in terms of size and height from the buildings in New Cairo city, yet, their floor plan distribution is almost the same.

The new characteristics of projects in the New Administrative Capital would raise the cost of accommodation and businesses. A programme of land price control is in effect for six months by the government. The price of the land has only grown to date. It does not give the low-income population of Egypt access to housing in the New Administrative Capital. There is a real possibility that the new city will continue with the conventional spatial segregation as in Cairo today.



Figure 15 R3 Residential buildings in the New Administrative Capital. Source: "New Capital Cairo Egypt Photos." New Capital Cairo Egypt Photos Download JPG, PNG, GIF, RAW, TIFF, PSD, PDF and Watch Online, www.keralapool.com/photos/new-capital-cairo-egypt.html.



Figure 16 Bayt Al-Suhaymi in Islamic Cairo. Photo by Huber Gerhard

Figure 17 Riad Yasmine in Marrakesh. Photo by boutiquesouk

The courtyard typology has played a fundamental role in dropping the harsh climate temperature of the desert as in the old Islamic Madina typology. Also, it creates a sense of privacy for the inhabitants of the dwellings, bearing in mind the social and cultural aspects of Egypt and the Arabic world. However, unfortunately, the created residential buildings in the fourth-generation cities do not reflect Egyptian society's social, cultural and physical dimensions.

Finally, the NAC does not offer social housing units for low-income groups. On the other hand, the State plans to attract low-income groups to the vacant housing units in the neighbouring cities.

5. THE BUSINESS DISTRICT

While the State's approach towards residential typologies has not changed, it has introduced new office building typologies in the New Administrative Capital and other fourth-generation cities. These office buildings are a replica of Dubai in terms of size and materiality and not reflecting the context. In addition, they have introduced glass skyscrapers built by Chinese companies. One of these will be the tallest in Africa. With this approach, it seems like the State is trying to copy the Dubai dream of architectural bigness.

The business district is constructed by Chinese State Build Engineering Corp's (CSCEC) workers. It includes 21 skyscrapers, including the tallest African tower with 85 floors.¹⁶ *"Bigger isn't always better," says Horner. "There's passion in this part of the world for building big, but we don't want to create a monumental city. The government is doing it for necessity. We spent a lot of time making scale comparisons with other cities around the world, making sure we're not committing the same mistakes as in the past."*¹⁷

The New Administrative Capital intends to have different land uses. Phase one focuses on the governmental areas, the Economic District, part of the Green River, and some residential units. Although the State provides affordable housing, the average prices are not affordable, as they are beyond an average public employee.

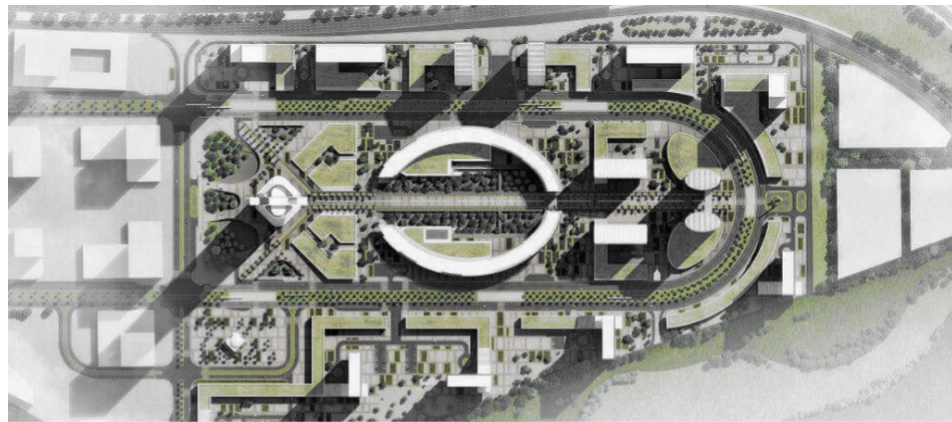


Figure 18 The proposed business district in the New Administrative Capital. Source: NUCA



Figure 19 The proposed business district in the New Administrative Capital. Source: NUCA



Figure 20 The Proposed Business District in the New Administrative Capital. Source: NUCA

6. THE HIGH SPEED TRAIN

In cooperation with the local firms, Orascom Construction Ltd and The Arab Contractors (Osman Ahmed Osman & Co.), the National Authority for Tunnels has signed a Memorandum of Understanding (MoU) for the planning, installation and commissioning of Egypt's first-ever High-Speed Rail Transportation System. Siemens Mobility will also provide maintenance facilities. The agreement involves a 1000km network rail infrastructure, the first of which is a 460km high-speed railway. The original high-speed line's order worth is 3 billion dollars.

"Our digital leadership and comprehensive turnkey services will bring an integrated and State of the art high-speed rail system that will provide a technology boost for the country and create local jobs. The system will significantly enhance passenger experience and reduce travel time for millions of Egyptian people," said Michael Peter, CEO of Siemens Mobility.



Figure 21 President El-Sisi signing the contract with the CEO of Siemens in 2021. Source: The Spokesmen of the Egyptian Presidency

The first 460 km high-speed line links the Mediterranean cities of ElAlamein to Ain Sokhna on the Red Sea and the future Administrative Capital. The train line will also be operable for freight transport purposes, further fostering regional economic growth.



Figure 22 The Route of the High Speed Train between Ain El-Sokhna, New Administrative Capital and Al-Alamein City. Drawing by Author

The urban situation in Cairo's desert cities is complex, yet, it was evident that the lack of an effective transportation system played a critical role in not attracting a fraction of the targeted number of residents and businesses. The high-speed train would trigger people to move to the New Administrative Capital and help attract businesses and investments. Also, it could become a catalyst of change that urbanises the deserted cities around Cairo. Also, the government is building the monorail which connects the New Administrative Capital with the 10th of Ramadan City - Badr City - Al-Sherouk City - Future City - Al-Ubour City - Al Salam City - Cairo. That will be the first sustainable mobility system connecting desert cities with Cairo. The State successfully constructed many stations; the monorail is expected to start running at the end of 2022.

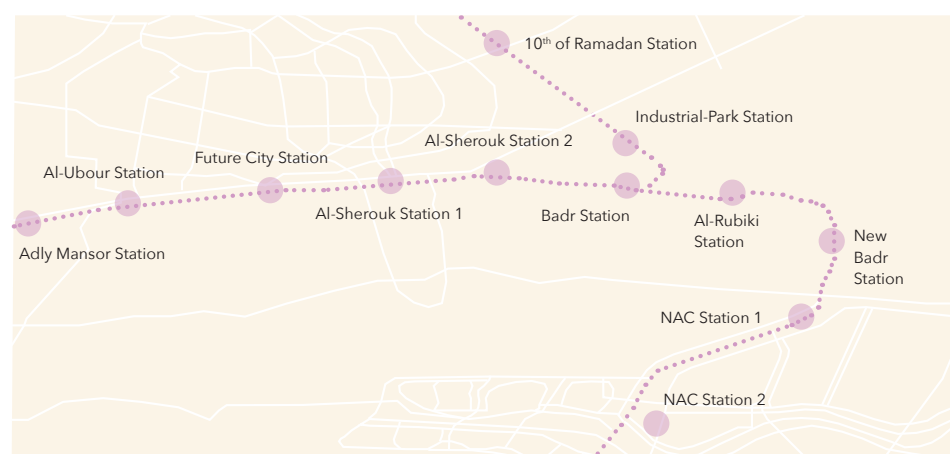


Figure 23 The Route of the Monorail that will connect the New Administrative Capital with the desert cities. Source: The Spokesmen of the Egyptian Presidency. Drawing by Author



Figure 24 One of the completed monorail stations. Source: www.tahiamasr.com/612759.

7. THE FINANCIAL MODEL OF THE NEW DESERT CITIES

"Egypt's government wants to start running the nation from a new capital in the desert from mid-2021, but the \$58 billion project is struggling to raise funds and needs to overcome other challenges after investors pulled out."¹⁸

Nearly 100000 subsidised homes are placed through eight districts in the north and south of the New Administrative Capital. Private investors will buy the rest of the housing plots. The housing department noted that the lands and units are sold "on actual cost, no overhead, and no profit" on a 20-year mortgage.¹⁹ Therefore, the government expects that selling these pieces would compensate for the project's costs.²⁰

"There has been a great investment for the infrastructure of the project: the roads, water system, electric grid and so on," Abbas (deputy housing minister) said. "This was necessary to convince private developers to come and build on the site."²¹ To date, Abbas is happy with the consequences. "Phase one (of the residential district) is almost complete," he says. "We have sold around 85% of the plots to 30 Egyptian and international developers."²²

One must pass by a blue gate with Chinese and English signs to access the New Administrative Capital City. The Central Business District is being built by the China State Construction Engineering Corporation (CSCEC), which won the contract in late 2017 after both governments signed a \$3bn deal. Egypt will pay the costs of the project to China after ten years.²³

The subsequent phases of the project are not yet fully developed. Deputy minister Abbas says that the second and third phases of the New Administrative Capital still need proper finance models. There are ongoing financial negotiations over the second and third phases between China Fortune Land Development and Dubai-based Emaar Properties.²⁴

FOREIGN LOANS AND AFFORDABILITY FEARS

*"There is very strong interest from the political leadership in the project," said Ahmed Zaki Abdeen, who works for the company which heads the New Administrative City. Nevertheless, he also said, "the large scale of the work leads to large scale problems", finding enough skilled labour to construct the "smart city" also financing the project with 1 trillion Egyptian pounds over the following years. "We need very extensive financing, and the state does not have money to give me," Abdeen said, adding that around 20% of investments are from abroad, with \$4.5 billion from China.*²⁵

Such a large-scale project needs billions of dollars. However, after promoters are backed down, the estimated 58 billion US dollars initiative seems to be struggling to collect funds.²⁶ To create a central business zone in the New Administrative Capital, the Chinese State-owning Industrial and Commercial Bank of China has signed an agreement to pay for a loan of \$3 billion.²⁷ Abdeen states that a Chinese corporation is constructing an energy network for the new capital of \$1.2 billion from Cairo.²⁸

The accommodation constructed at the New Administrative Capital "is much better quality than the informal settlements". However, it is doubtful that many residents will be able to afford it.²⁹ *"People [living in the informal settlements] or even the lower middle classes can't afford anything in the New Administrative Capital." But he concedes that "upper-level employees can probably afford these units", especially with "heavily subsidised" mortgages.*³⁰

*Regardless of their concerns, both the urban analyst (who prefers not to mention his name) and Sims agree that the development is proceeding at an impressive pace. "It is happening," says the urban analyst. "Whether we like it or not, they are getting things done."*³¹ Sims adds: "Will the new capital succeed? Realistically? God knows. But the government is certainly going ahead with it; they're doing a wonderful job so far."³²



Figure 25 President El-Sisi checking the New Administrative Capital with military generals in 2021. Source: The Spokesmen of the Egyptian Presidency

A financial bubble that might take place in Egypt in the following years is foreign loans from overseas investors. For example, all new skyscrapers in the New Administrative Capital are built by Chinese companies and financed on loans with interest for the next 30 years. Likewise, all the construction of high-speed train infrastructures has a similar foreign financial model.

Driving through Cairo's main roads nowadays, one can notice the dominance of oversized billboards marketing various real estate projects around Greater Cairo. It gives an impression that everyone can afford this lifestyle and puts social and financial pressure on individuals to achieve the Egyptian version of the "American Dream". However, Egypt's one-third population is under the global poverty line.³³



Figure 26 Property Billboards in Cairo. Source: Outdoor Advertising Campaigns, 10 Dec. 2019, insiteooh.com/article/2770-stone-street-egypts-mixed-use-project-has-arrived-at-cairos-billboards.



Figure 27 Property Billboards in Cairo. Source: Outdoor Advertising Campaigns, 10 Dec. 2019, insiteooh.com/article/2770-stone-street-egypts-mixed-use-project-has-arrived-at-cairos-billboards.

THE CONSEQUENCES OF THE NAC ON THE NEIGHBOURING DESERT CITIES

Although the New Administrative Capital raises many questions about its feasibility and the need to construct such a mega-scale project, the new urban dimensions that plan to take place have the possibility of changing the realm of the eastern desert cities around Cairo. The new mobility infrastructure would connect the desert cities with Cairo and facilitate transportation from and to Cairo.

First, Road network investments between the desert cities in the last seven year should make mobility easier for vehicles. Also, constructing the central bus terminal next to Cairo International Airport would facilitate public transportation.

Second, the monorail that will connect the desert cities with Cairo is another milestone for the mobility infrastructure in Greater Cairo. Thanks to that project, low-income groups could finally have the possibility of commuting to desert cities in a short time.

Third, introducing the high-speed train in Cairo's desert cities will change the logic of time and distance. In that sense, connectivity between Suez, the New Administrative Capital, New Cairo and the 6th of October City will reach a new metropolitan model.



Figure 28 The Business District in NAC (September 2021). Source: Twitter, 5 Sept. 2021, twitter.com/mahmoued-gamal44/status/1434641740582072326.

NEW CAIRO CITY

New Cairo City is relatively urbanised and well-developed. However, New Cairo is a growing city full of gated communities. An example of a community with a dominant social exclusion!

New Cairo was a new effort to flee from the Egyptian capital. In 1993, New Cairo nuclei existed in the east: the first, third and fifth settlements. The government then agreed that the zones allocated for these new urban settlements would be expanded and included in the broader zone called New Cairo. The remaining areas were distributed between the first three settlements and sold for investment. (El Khorazaty, 2006).³⁴

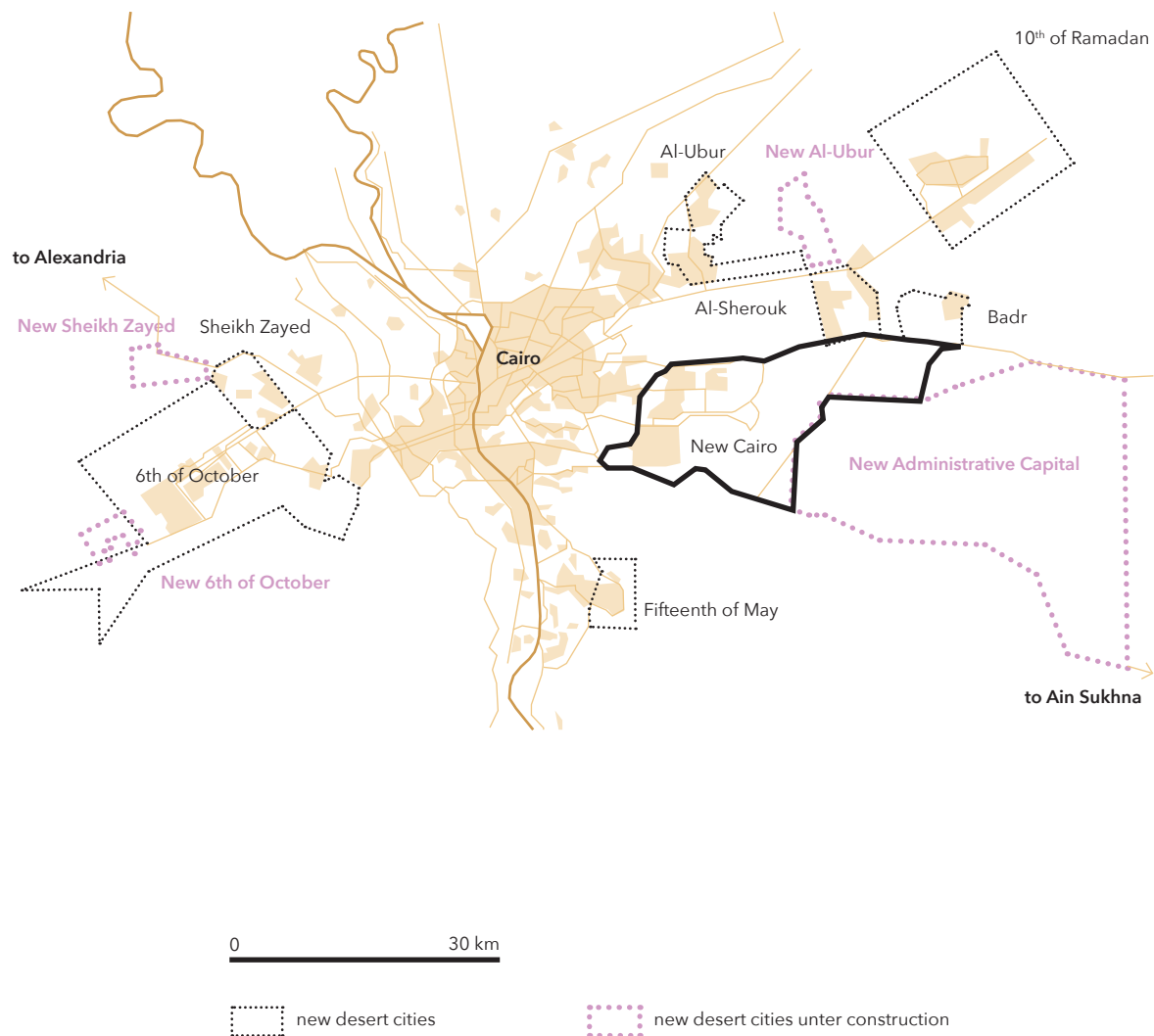


Figure 29 Desert cities around Cairo. Drawing by Author

New Cairo was not only a new attempt to leave Cairo but also an idea to create an inclusive urban planning model. The goal was to counter social division between the wealthy and the poor, minimise the shortage of affordable housing, and improve the implementation of urban law (El Khorazaty, 2006).³⁵ However, the way New Cairo developed was the dichotomy of urban planning. It is essentially an establishment for a modern phase of social isolation for several reasons: the appearance of gated communities and fenced industrial, economic, and educational facilities, which ultimately contributed to urban separation.

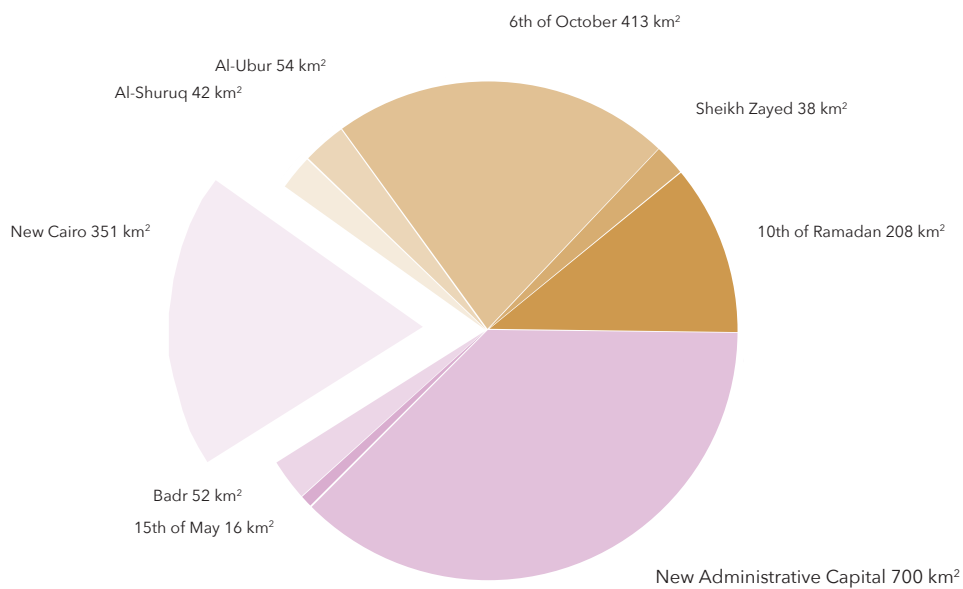


Figure 30 New Cairo City total area compared to the rest of the Desert Cities around Cairo. Source: Census of Egypt, 2006. Graph by Author

1. THE URBAN LAYOUT AND MASTERPLAN
PHASE ONE OF NEW CAIRO: 1993-1995

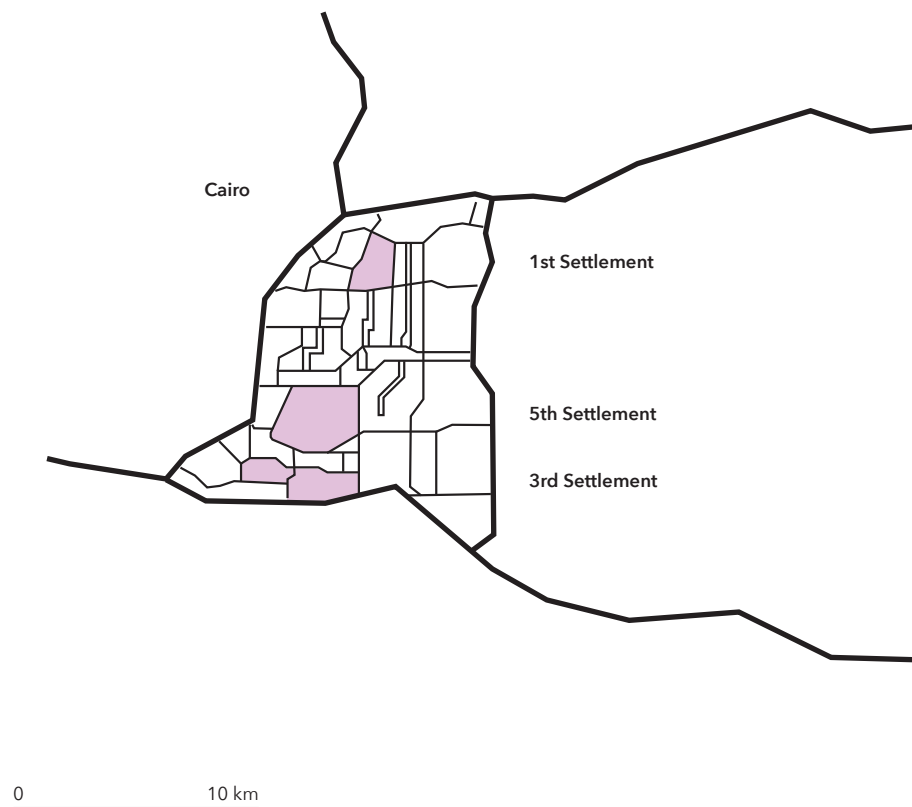


Figure 31 1st, 5th and 3rd settlements included in New Cairo master plan 1993 (Oekoplan Engineering Consultations, (1997), New Cairo City Report, Drawing by Author

The first three settlements: the first, the third and the fifth, focus on housing low-income residents. Accordingly, approximately 115 km² (approx. 27,000 acres) of land in New Cairo has been planned for 1 million citizens (El Khorazaty, T., 2006).³⁶



Figure 32 Economic housing that existed in the 5th settlement since the start of New Cairo by Randa A. Mahmoud

PHASE TWO: 1995-1997

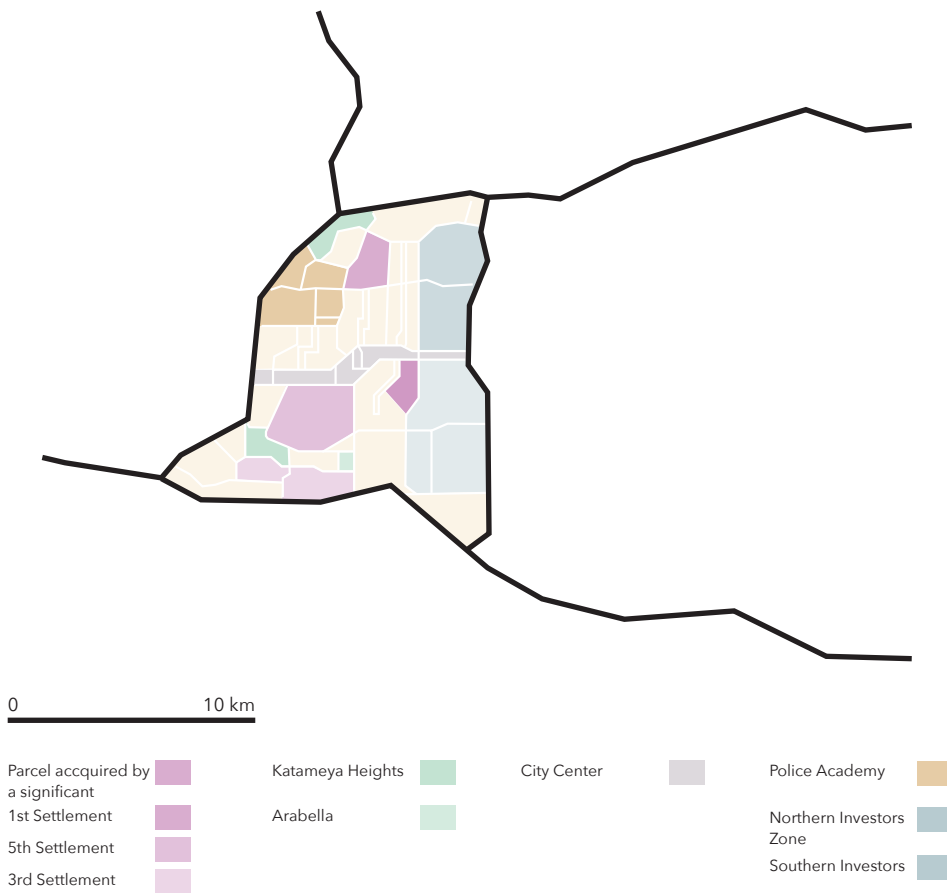


Figure 33 New Cairo City master plan in 1997 including the three settlements, first gated communities, the City Center, the Northern and the Southern Investors Zones (Oekoplan Engineering Consultations, (1997), New Cairo City Report) Drawing by Author

New Cairo City was created first by expanding and filling areas with planned communities between the three existing settlements, with individual residence parcels (each with a surface area of approximately 600 m² and building heights from G+3 to G+5). At the same time, large plots were provided to developers to build gated communities, most notably in northern and southern zones, such as Katameya Heights (350 acres), Arabella (100 acres), Mirage Golf City (400 acres) and Al-Rehab (1500 acres), and in addition to other smaller plots. It is worth mentioning that selling such parcels to developers to create gated communities was planned to encourage the management and preservation of these parcels, substantially relieving the government of its task and speeding up urban growth.³⁷

The city successfully attracted mixed uses, shopping, entertainment, office buildings, hotels and sports clubs. A linear core with a length of around 13 km and a width of between 300 and 600 meters connects New Cairo from the east to the west, hosting service-delivery services. A 90 meters wide street juxtaposes the linear core. The State planned that street with 90 meters of width to facilitate the mobility of cars. Nevertheless, unfortunately, it left no chance for pedestrians to cross the street.



Figure 34 The 90th Street, 90 meters wide. Source: Mahmoud Morsy, Google maps

PHASE THREE: 1997-1999

The city had grown fast at that time, including its plots, district facilities and neighbourhoods, the first gated communities, and the city centre with some offices. The government has therefore competed to expand the region to 45,000 acres and host 3 million inhabitants. The winning plan proposed to create five oases in green open spaces. Every oasis included neighbourhoods and districts, which primarily serve individual plots and a few gated communities to continue the idea of urban growth. However, the winners' plan was not fully implemented, except for the city extension's primary structure and some land use, extending the centre and large plots for educational institutes and other facilities. It is critical to emphasise that the large parcel in the northeastern corner of the city illustrates that there were already ideas, at the time of the competition, to sell large plots to developers for mega-scale projects.³⁸



Figure 35 Development of New Cairo: Al-Rehab City, Individual Housing and the 90 Street at the 5th Settlement that started to develop massively back in 1999.

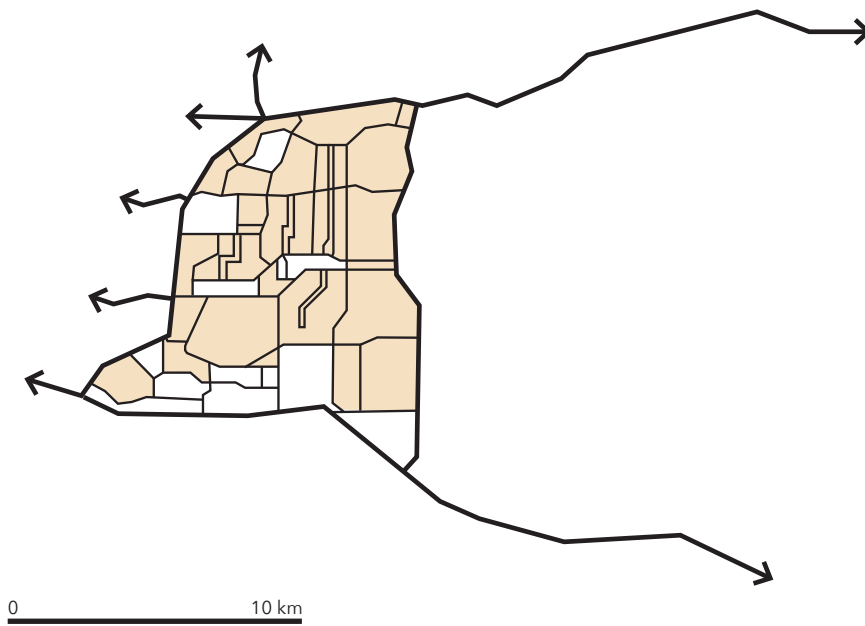


Figure 36 proposal for New Cairo's extension in 1997 (Oekoplan Engineering Consultations, (1997), New Cairo City Report). Drawing by Author

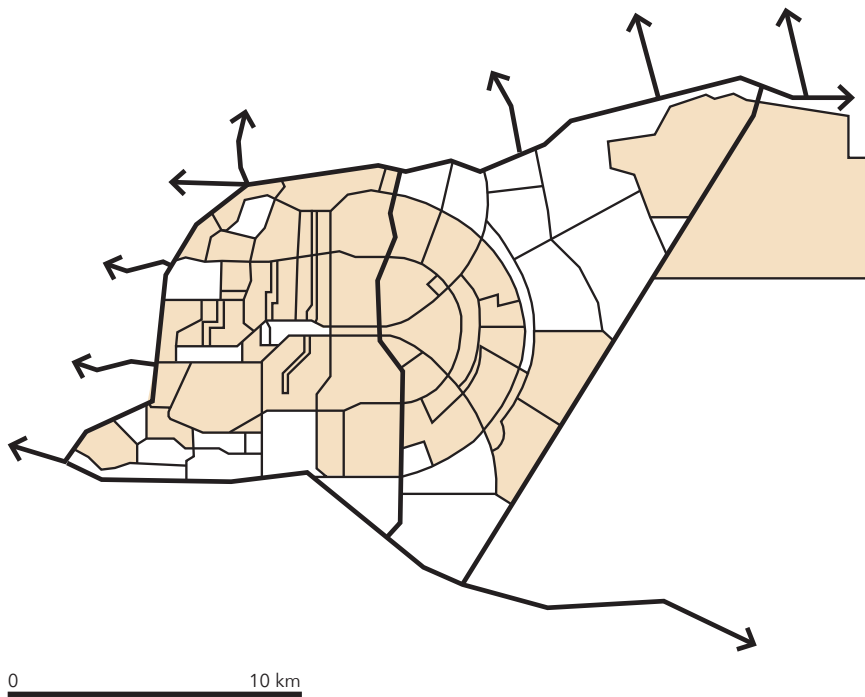


Figure 37 Masterplan of New Cairo between 1999 and 2010 (GOPP and NUCA, 2014) Drawing by Author

PHASE FOUR: 1999-PRESENT

The real change in the urban environment had come about at this stage: the government had begun to give investors (more than 1000 acres), after abandoning the winning extension proposal and lack of government support, particularly following Al-Rehab City, as a self-sufficient city. This period was dominated by massive investments in the media-promoted property industry and an unpredictable exchange rate encouraged by the US Dollar. The Masterplan adopted between 1999 and 2010 (Fig.38) clarifies the discrepancy between the original Masterplan's urban policies and the expansion goals. The yellow colour signifies the plots sold to private developers who ignore the urban definition of all-inclusive development initially intended in the Masterplan. A part of the police academy has been sold and turned into walled ghettos in New Cairo's first gated communities (Mirage Golf, Katameya Heights and Arabella) and the Northern and Southern Investors' Areas (mostly built into gated communities behind high walls like Katameya Residence, Porto Cairo, Montagaa Al-Nakhiel and Swan Lake). At this time, living in gated communities started to symbolise the hope of many Egyptians. Egyptians were primarily led by the marketed picture of being socially highly ranked.

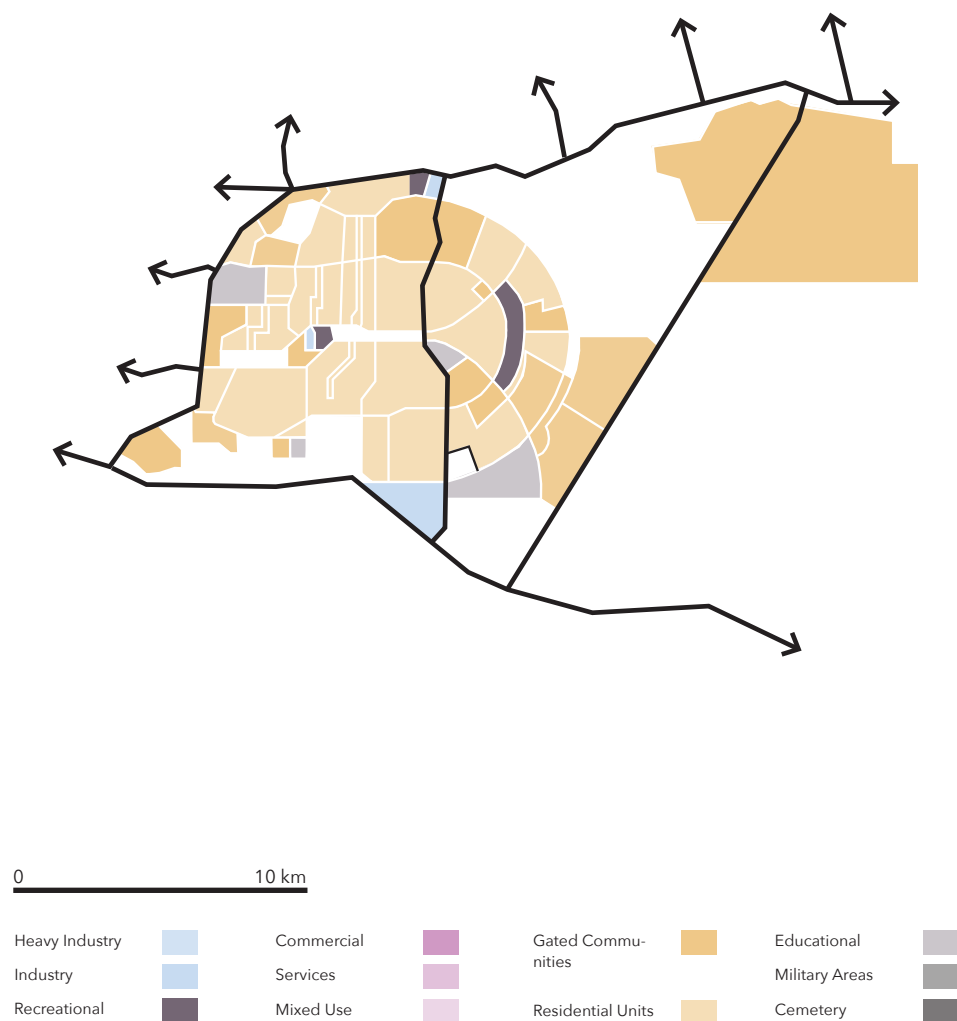


Figure 38 Zoning of New Cairo City. Drawing by Author



Figure 39 Gated Communities in the Northern and Southern Zones that started to outline a privileged social image since the year 2000. by Randa A. Mahmoud

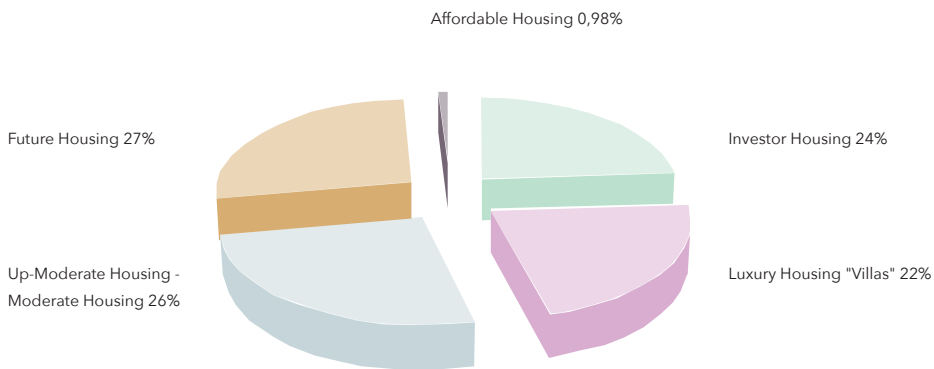


Figure 40 Zoning Ratio in New Cairo. Source: Hafez, Reham M. "New Cities between Sustainability and Real Estate Investment: A Case Study of New Cairo City." Graph by Author

2. DENSITY AND STREETS

By drawing solid and void maps for different neighbourhoods in the city, one can understand the urban fabric's density and typology. For example, analysing such a map for Katameya Heights in the west of the town explains how much space is devoted to greenery and golf courses. This gated community has the lowest density in New Cairo, with 0.05 GFZ, while the West Golf neighbourhood on the left of Katameya Heights has 1 GFZ density.



Figure 41 Solid and Void in New Cairo Gated Communities (Katameya Heights and West Golf). Drawing by Author

Moving more to the east of the city, where the social housing estates are, the German University in Cairo and the Arabella gated community, one can observe a mix of different densities. Social housing estates in the south have a relatively high density (GFZ: 4), while Arabella's gated community offers low-density living, with large areas of greenery and few dispersed villas (GFZ: 0.3).



Figure 42 Section drawing in the social housing estate. Drawing by Author



Figure 43 Section drawing in Arabella Gated Community. Drawing by Author



0 500 m

Figure 44 Solid and Void of Social Housing in New Cairo (South). Drawing by Author

Madinaty golf gated community in New Cairo is another example of a low-density neighbourhood, where golf courses and extravagant greenery dominate the urban environment. As golf green fields surround every villa (2-3 storeys), this neighbourhood's density can hardly exceed 0.2 GFZ. By drawing section diagrams across Madinaty gated community, the typology of the architecture and urbanism does not look much different than many gated communities in New Cairo.



Figure 45 Section drawing in Madinaty Gated Community. Drawing by Author



0 500 m

Figure 46 Solid and Void in New Cairo (Madinaty Golf Compound). Drawing by Author

3. OPEN SPACES AND GREENERY

Different social classes used to go downtown in New Cairo before the opening of Cairo Festival City. The CFC (open-air area with a large food court and a shopping centre) attracted many people as they felt "safer" in a gated area. In comparison, the prevalence of gated communities "exacerbation of social cleavages existing already is promoted by the proliferation of gated communities" (Blakely & Snyder, 1997). The necessity for being or living in a closed environment would result in social segregation and a ghettoisation effect since these closed communities are only reserved for certain social classes, excluding most of the population.³⁹



Figure 47 "Cairo Festival City. Source: www.cairo360.com/article/city-life/for-those-couldnt-make-it-to-russia-cairo-festival-city-mall-ha



Figure 48 Greenery in Al Rehab in New Cairo. Source: "New Cairo City: Al Rehab Und Madinaty, Ägypten." HeidelbergCement Group, www.heidelbergcement.com/de/new-cairo-city-al-rehab-und-madinaty.



Figure 49 Open spaces and Greenery in Madinaty in New Cairo. Source: Breitner, By: Miklos. "Madinaty Golf Facilitates to 600,000 People." Golf Business Monitor, 27 Dec. 2018, golfbusinessmonitor.com/golf-club-marketing/2018/12/madinaty-golf-egypt.html.

Golf resorts and extravagant greenery dominate New Cairo's private open spaces. Although new Cairo is higher than the Nile level (large amounts of electricity are needed to pump water to the city) and the country is suffering from water shortage, gated communities insist that the "American" greenery is the correct answer to open spaces. However, with the rising temperatures, the exponential population growth in Egypt and the water poverty crisis that faces the country, it is questionable how this typology of open spaces will continue to function in the future.

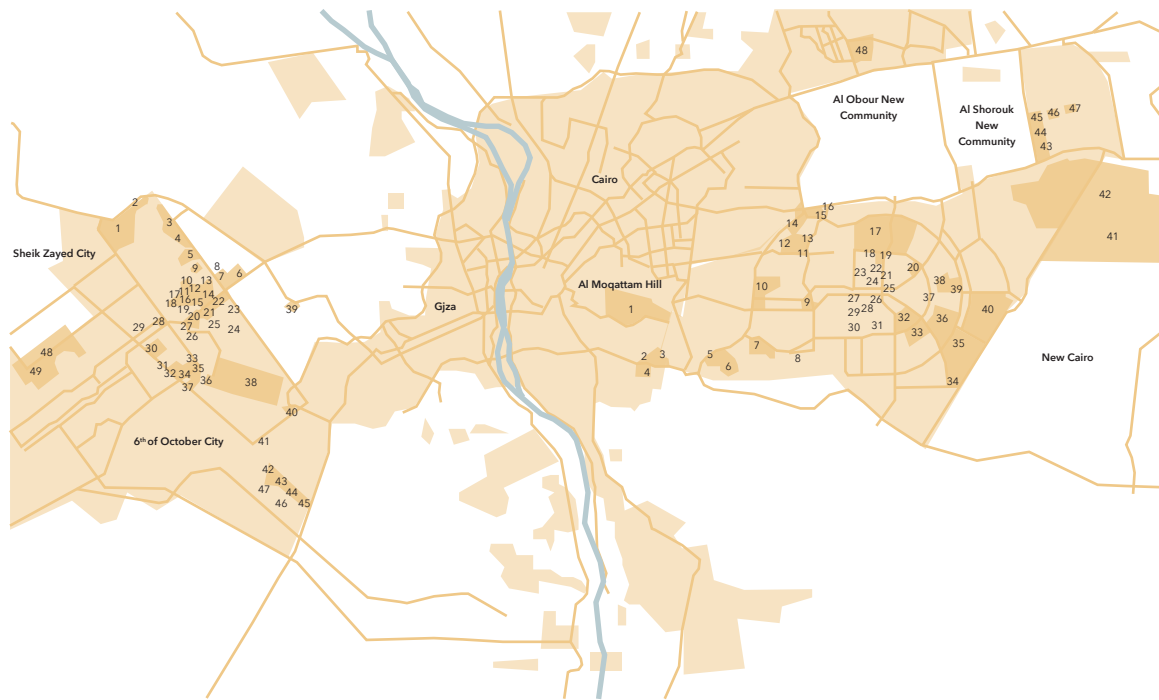


Figure 50 Open spaces in New Cairo social housing. Source: Mahmoud Foad, googlemaps.

Since lavish greenery, open spaces and golf courses represent many private gated communities in New Cairo, typologies of the open spaces in social housing estates are the complete opposite. Asphalt is the dominant material in social housing estates (for parking areas). Also, fences between dwellings or estates do not exist like gated communities, creating estates with asphalt terrains and dispersed copy-paste housing units.

4. HOUSING

The Egyptian Revolution in 2011 and the economic crisis in Egypt influenced this period. The real estate market was the only market that maintained its value. That alone was a spark for more investment in this market. Therefore, the number of gated communities has been growing to cope with the high demand. The expanded portion of New Cairo remained dominant, with mostly gated communities, residential neighbourhoods and education facilities. These are built by major financial firms, with large plots creating 1000 acres. Also, due to cultural and security needs and the relentless marketing by media of the wellness picture of living in a gated community, some areas have been fenced into isolated buildings, for example, the West Gulf Region near the Katameya Heights, the Public Security Housing and the Ministry of Interior in front of the Mirage Golf City. The effect is the emergence of a phenomenon of ghettoisation which will contribute to social isolation.



- | | | | | | |
|---|---|--|--|--|---|
| <p>Gated communities west GCR</p> <ol style="list-style-type: none"> 1. Beverly Hills (SODIC) 2. Meadows Park 3. Al Gowhara 4. Al Rabwa (TMG) 5. Al Yasmeen 6. Royal City (Kuwait) 7. Green Hill 8. Al Gowhara (2) 9. Al Karma (Zayed) 10. Greens (Dorra) 11. Mohandeseen Gardens 12. Zahret Al Madaen 13. Diplomats Compound 14. Al Nada 15. Zayed 2000 (Dorra) | <ol style="list-style-type: none"> 16. Al Karma (2) 17. Al Gazeerah 18. Sama Zayed 19. Al Sulameneyah Gardens 20. El Safwa 21. Green Hills 22. Al Khamael City 23. Palm Hills 24. Utopia 25. Al Karma (October) 26. Swan Lake 27. Royal City (October) 28. October Hills 29. Al Worood Compound 30. Meha Garden City 31. Spring Valley 32. Royal Hills | <ol style="list-style-type: none"> 33. Yasmeen Greenland 34. Gardenia Park 35. Al Nasayem 36. Al Rawda 37. Rayhana Compound 38. Dreamland (Bahgat) 39. City View 40. Al Ashgar 41. Star City 42. Al Loeloa 43. Al Montezah 44. Rowdet Al Salemeya 45. Utopia (2) 46. Golf Residence 47. Al Rabab 48. Peaceful Rabwa 49. Telal October (Kuwait) | <p>Gated communities east GCR</p> <ol style="list-style-type: none"> 1. Uptown (Emaar) 2. Degla View 3. Al Baroan City 4. Maadi Grand City 5. La Reve 6. Stone Park Kattameya 7. Kattameya Heights 8. Arabella 9. Lake View 10. Cairo Festival City 11. Marina City 12. Nakeel Village 13. Swan Lake 14. Mirage City 15. Golden Heights | <ol style="list-style-type: none"> 16. Bright City 17. Al Rahab (TMC) 18. Al Horreyah 19. Kattameya Plaza 20. Qatari Diar 21. Al Safwa 22. Royal Lagoon 23. Al Ashrafeya 24. Etoile des Villes 25. Oriental Co. 26. Moon Valley 27. Al Masraweya 28. Arabeya 29. Al Aseel 30. Fountain Blue 31. Zinzia City 32. East Town (SODIC) | <ol style="list-style-type: none"> 33. Katameya Dunes 34. Center Ville (Damac) 35. Hyde Park (Damac) 36. Mivida (Emaar) 37. Maxeem 38. Palm Hills Kattameya 39. Efad (Kuwait) 40. Barwa (Qatar) 41. Future City 42. Madinaty (TMG) 43. Al Nakhheel 44. May Fair 45. Al Shorouk 2000 46. Loeloa Al Shorouk 47. Spring Valley 48. Golf City (Obour) |
|---|---|--|--|--|---|

Figure 51 Gated Communities in New Cairo in relation to Greater Cairo. Data based on NUCA. Source: Almatrneh, Rana. (2013). Choices and changes in the housing market and community preferences: Reasons for the emergence of gated communities in Egypt: A case study, Drawing by Author

The emergence in the last twenty years of global gated communities demonstrates the need for self-segregation. It is a fantasy of people enjoying "la belle vie" and being secured and covered in a fake bubble. The business vision is to live in a fantasy world and avoid all city problems: trafficking, pollution and sexual abuse (Cairo Observer, 2013).⁴⁰

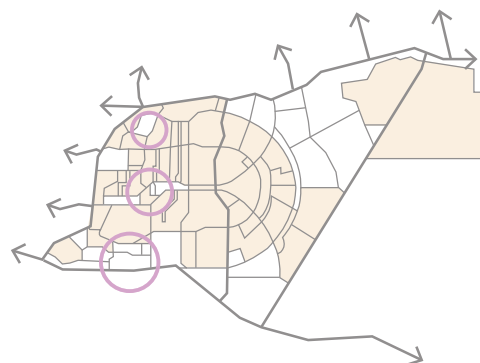
New Cairo was a new attempt at all-inclusive urbanism, resulting in several factors leading to ghettos and social exclusion. Marginalisation and separation of its inhabitants are not socially sustainable (Bagaeen & Uduku, 2010).⁴¹ The seeds of social segregation were the first prodigious gated communities, such as the Katameya-heights, the Mirage Golf City and Arabella. They became the role models of an imbalanced urbanisation phase by setting certain housing forms, lifestyles and attributes; targeted by the middle to higher social classes.⁴²



Figure 52 Typical Gated Community Gate in New Cairo. Source: www.isqan.com/ar/properties/دوبلكس 255 م-للبيع-في-كمبوند-فيلدج-جاردن-القمامية o7k6o7lp6au063q8xejn

5. SOCIAL HOUSING IN THE CITY

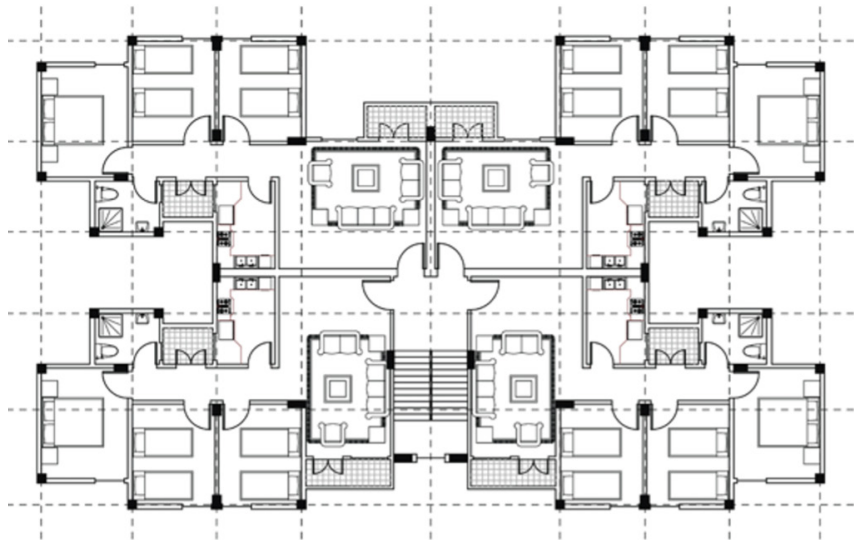
The typical H-block is the dominant social housing dwelling typology in New Cairo (as in all desert cities around Cairo). However, it is not the only typology. The linear block is also a social housing typology in New Cairo. As the social housing estates are on the periphery of the city (either north or south), they did not succeed in attracting the population as the rest of the housing units in the city. Figure (53) represents the locations of the social housing estates in New Cairo, representing a small portion of the city. As illustrated, the three social housing estates take place only in the first constructed phase of the town; further city developments focused on the private sector housing schemes.



0 10 km

Figure 53 Social Housing Estates in New Cairo. Drawing by Author

Most social housing units' residents are from low-income groups, so many do not own vehicles. That was one of the main reasons for the failure of social housing estates to attract residents.⁴³ In addition, although the city is constructing a monorail that passes through the town and connects it with the surrounding neighbourhoods, this public transportation route does not pass through the social housing estates (which are the most in need of that service). As a result, the route of the monorail line is questionable.



0 10 m

Figure 54 The typical H-Block Social Housing Dwelling in New Cairo. Drawing by Author



Figure 55 Social Housing in New Cairo. Source: " الشقة مترًا بالتقسيم على 90 سنة.. كيف تجرز شقة إسمان اجتماعي بالطرح الجديد 2021؟ " الجريدة العقارية aleqaria.com/Post/details/34175/ الشقة-مترًا-بالتقسيم-على-90-سنة-كيف-تجرز-شقة-إسمان-اجتماعي-بالطرح-الجديد-؟.

6. THE INDUSTRIAL AREA

Although the industrial district in New Cairo is relatively thriving (as factories are built on most of the land plots), compared to other desert cities around Cairo, the industrial zone represents less than 1 per cent of the city's area. That does not allow the industrial area to attract enough workers, which can speed up the urbanisation process of the town.

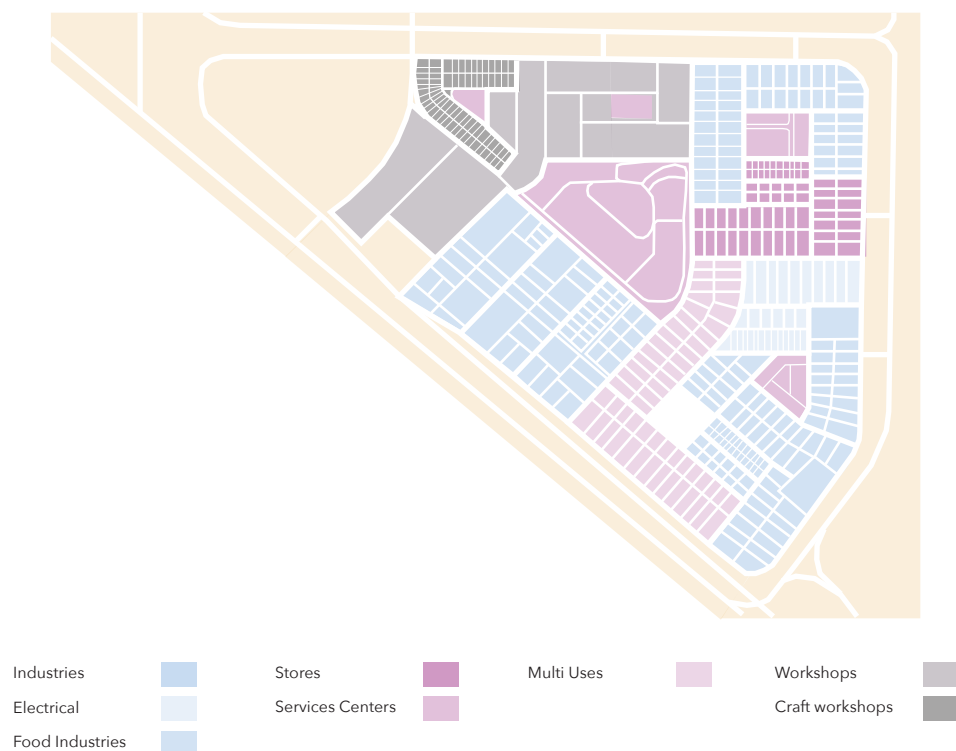


Figure 56 Industrial zone in New Cairo city. Source: Hafez, Reham M. "New Cities between Sustainability and Real Estate Investment: A Case Study of New Cairo City." Drawing by Author

Due to the proximity between Cairo and New Cairo and the fair amount of social housing units built in the early stages of the city, the industrial area could have capitalised on these factors to reach better industrial results. However, as the New Administrative Capital is developing at a high pace, there is still a high chance for new industrial areas to catch up with the urbanisation process, offer diversity to the city and create different job opportunities.

7. THE CONSEQUENCES OF THE NAC ON NEW CAIRO

The area marked in pink in the diagram below represents the desert land between New Cairo and the New Administrative Capital. The monorail and the high-speed train will connect the NAC with the neighbouring cities; this allows public transportation to become a catalyst of change to the deserted towns. There is a chance for this area (marked in pink) to host different sectors of society (mainly low-income groups). Unfortunately, this part is under construction, where many expensive gated communities will take place.

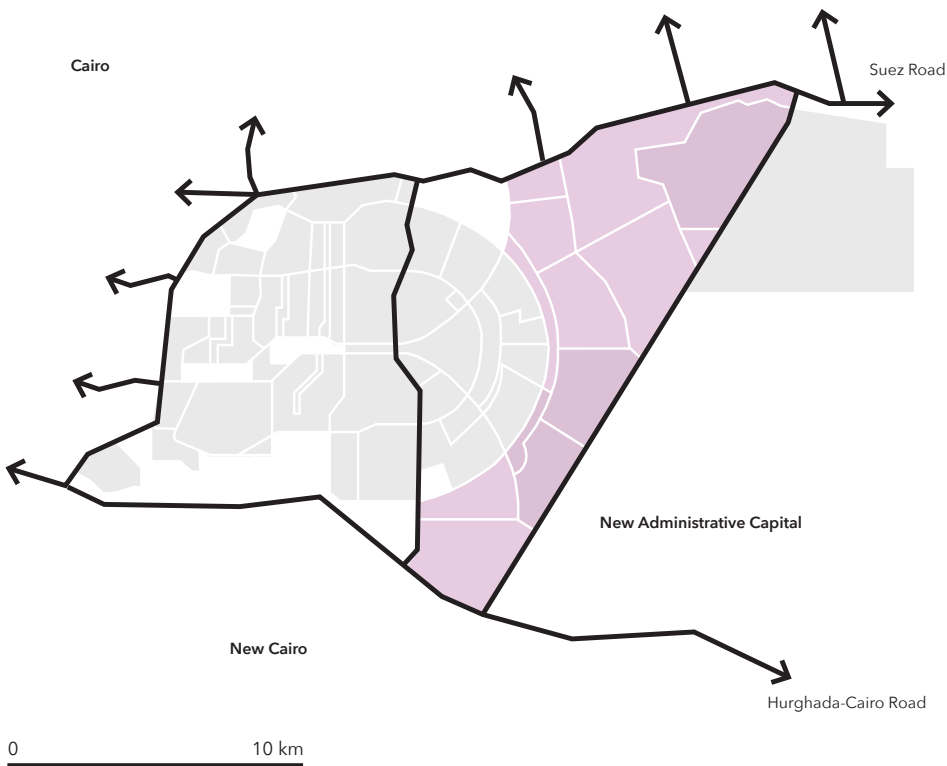


Figure 57 Development area between New Cairo and New Administrative Capital. Drawing by Author

FINAL THOUGHTS

The urban paradox of New Cairo is visible in contrasts between the original Masterplan and the extension scheme introduced, where developers have more plots than the rest of the city. The widespread high wall ghettos in the city, particularly in the newly developed eastern portion, make this paradox evident. In addition, the presence of gated communities at this pace surplus road networks and ungated public spaces, while all the rest of the urban fabric is treated as left-over.

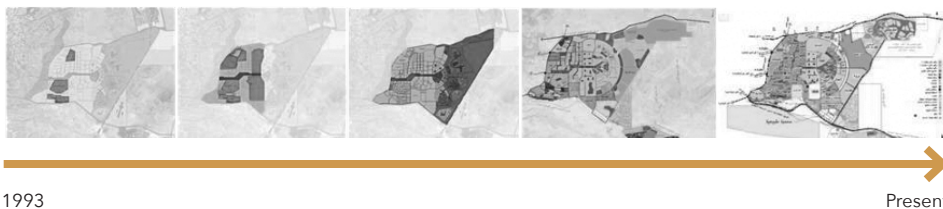


Figure 58 Urban evolution of the new settlement of New Cairo since 1993. (Oekoplan Engineering Consultations, (1997), New Cairo City Report & General Organization of Physical Planning- GOPP and New Urban Communities Authority- NUCA, (2014 and 2016), New Cairo City

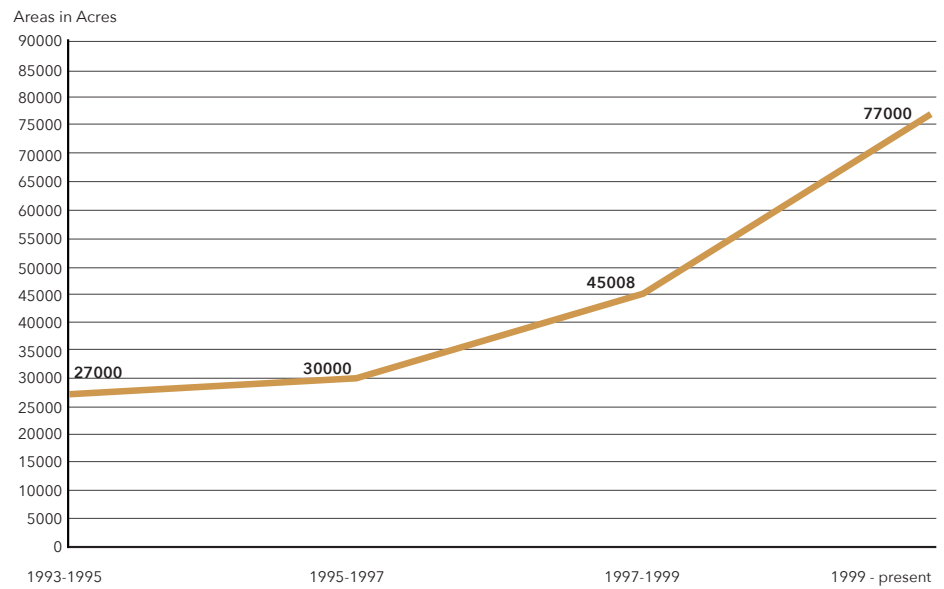


Figure 59 Area Development of New Cairo City. Graph by Author

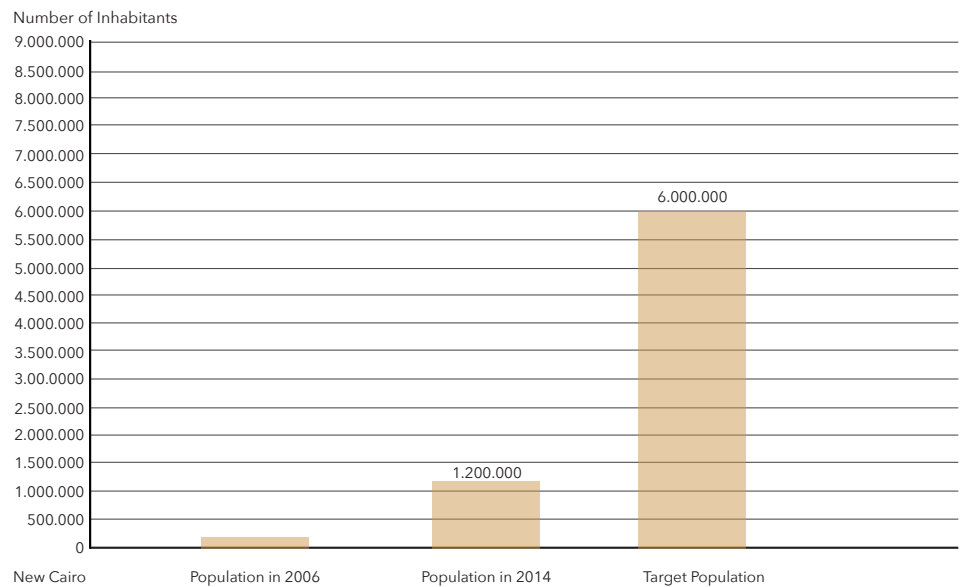


Figure 60 Comparison between the attracted number of population and the target population in New Cairo.

Source: NUCA. Graph by Author

By comparing Figure (59) with figure (60), one can notice that the area of New Cairo City has expanded dramatically from 1995 to the present. However, the attracted residents did not reach 25% of the targeted population, even though between 2006 and 2014, the city hosted 1 million inhabitants due to massive investments in gated communities due to the 2011 Revolution and safety concerns.

Also, it was attributed to the uncertainty of the Egyptian economic situation and the inflation of the Egyptian pound over the last few years, making the property market the most stable to invest in the paradigm urbanisation process. Finally, the withdrawal of governmental efforts in establishing an urban environment boosted the private sector to develop urban settlements, which significantly allowed the building of gated communities and removed burdens from the government's shoulders in developing the new desert cities. However, the clustered scope of the gated communities in New Cairo would result in ultimate social exclusion and ghettoisation.

BADR CITY

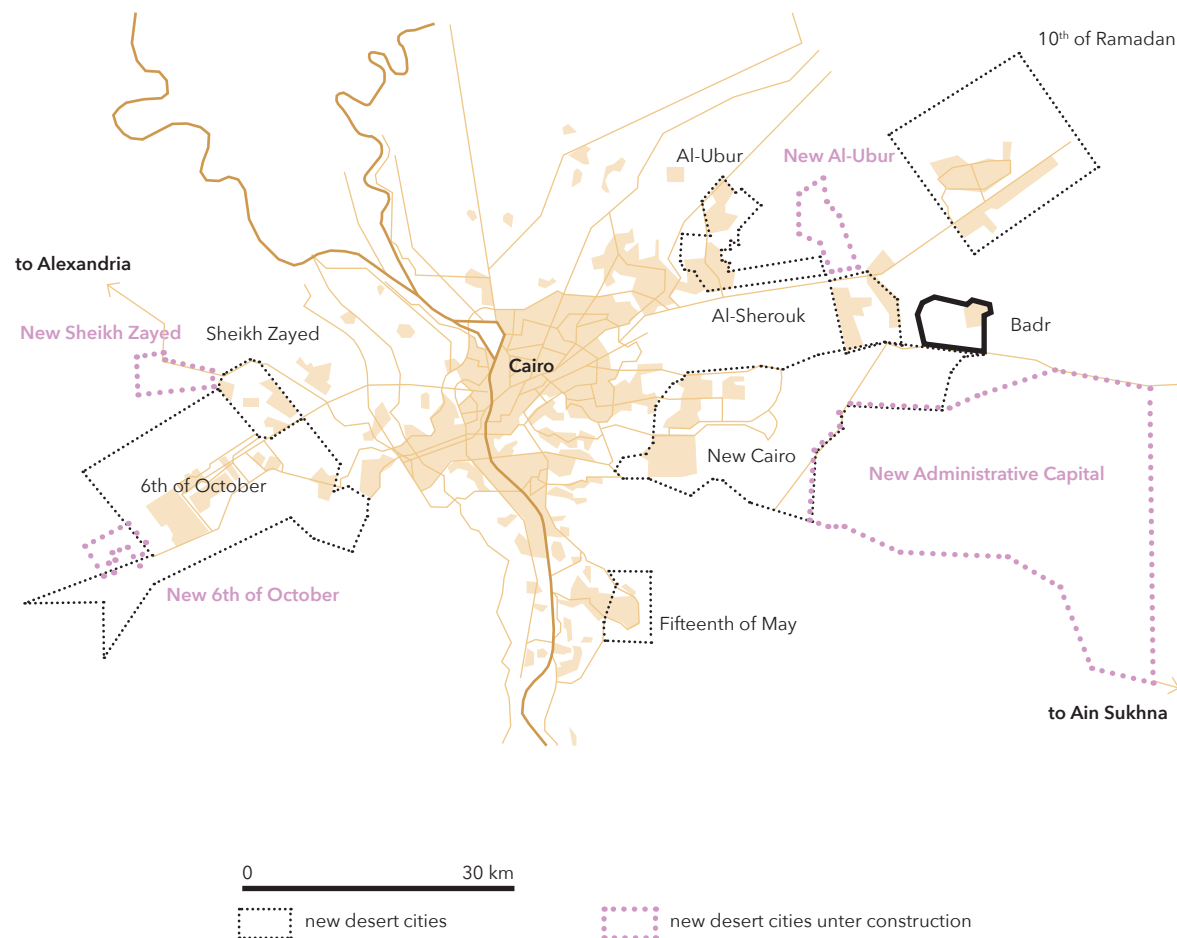


Figure 61 Deserted Cities around Cairo. Drawing by Author

Badr city is the second most distant city from Cairo. It is still nearly undeveloped, as it is fifty-three kilometres away from Cairo. Nevertheless, the city is one of the first generations of new industrial cities, planned to be part of the Greater Cairo Master plan in 1982.

By the 2006 Census, only 17,000 residents lived in Badr city, while the town covers a vast surface area of 52 km². Also, Badr city's manufacturing areas only attracted a few factories, while it was a decade-old target of efforts to evacuate dangerous industries from the central parts of Cairo. The new city has also been a favoured location for the government as they constructed at least 16,000 subsidised housing units for the evacuated residents of the slums. While the city takes place directly on the Cairo-Suez Road, where the expansion of Greater Cairo has been active towards the east, the growth of Badr city can be summarised as "too slow" till 2014.

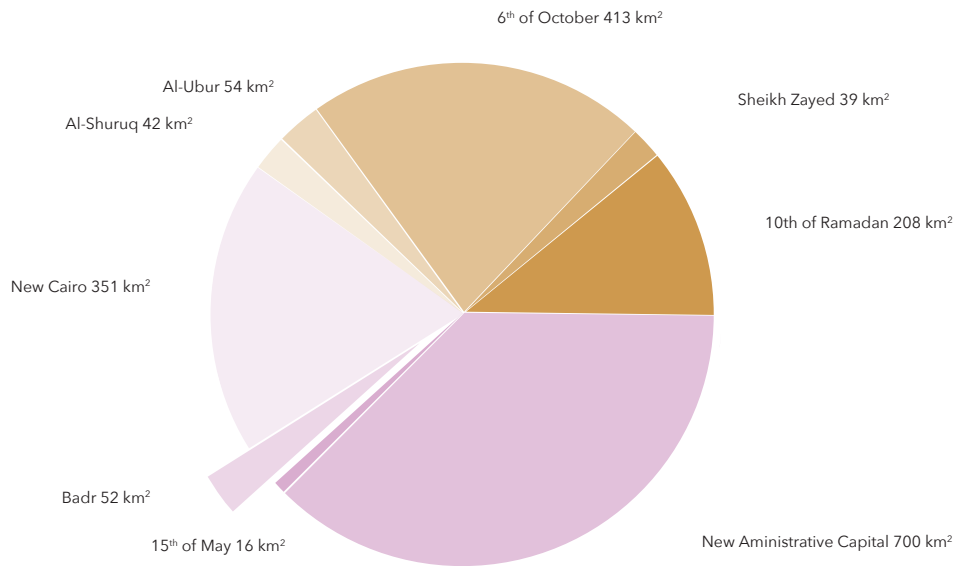


Figure 62 Badr City total area compared to the rest of the Desert Cities around Cairo. Source: Census of Egypt, 2006. Graph by Author

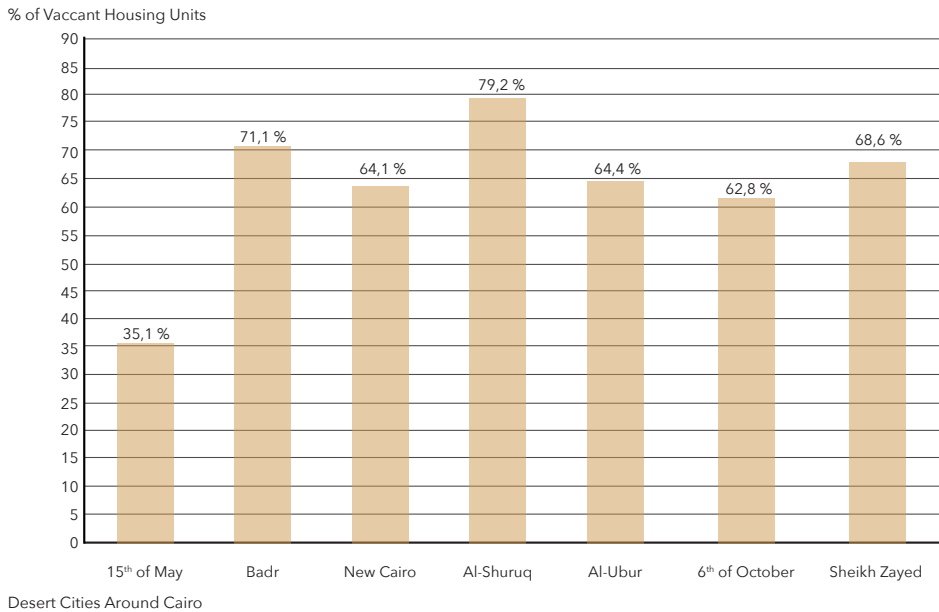


Figure 63 The Per Centages of Vacant Housing Units in the Desert Cities around Cairo. Source: Census of Egypt, 2006. Graph by Author

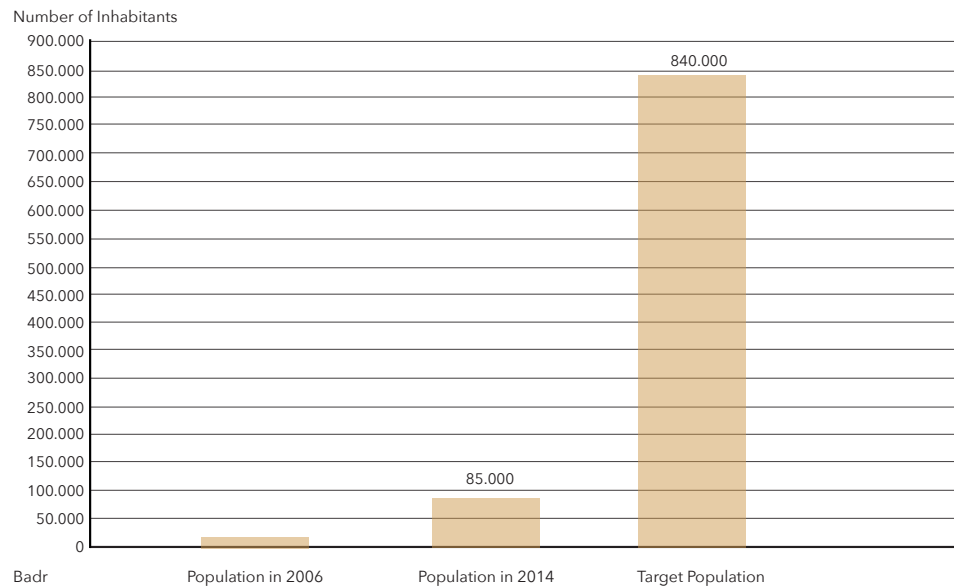


Figure 64 Comparison between the attracted number of population and the target population in Badr City.
Source: NUCA. Graph by Author

Figure (63) shows that Badr City has one of the lowest success rates in attracting new residents around Greater Cairo. The city has many vacant housing units, one of the highest number of vacant social housing units around Cairo's desert cities. Around 92,280 residential units took place in Badr city, and almost 71 per cent were empty in the 2006 Census. Although between 2006 and 2014, Badr City attracted 85,000 inhabitants, which is only 10% of the targeted population.

1. THE URBAN LAYOUT AND MASTERPLAN

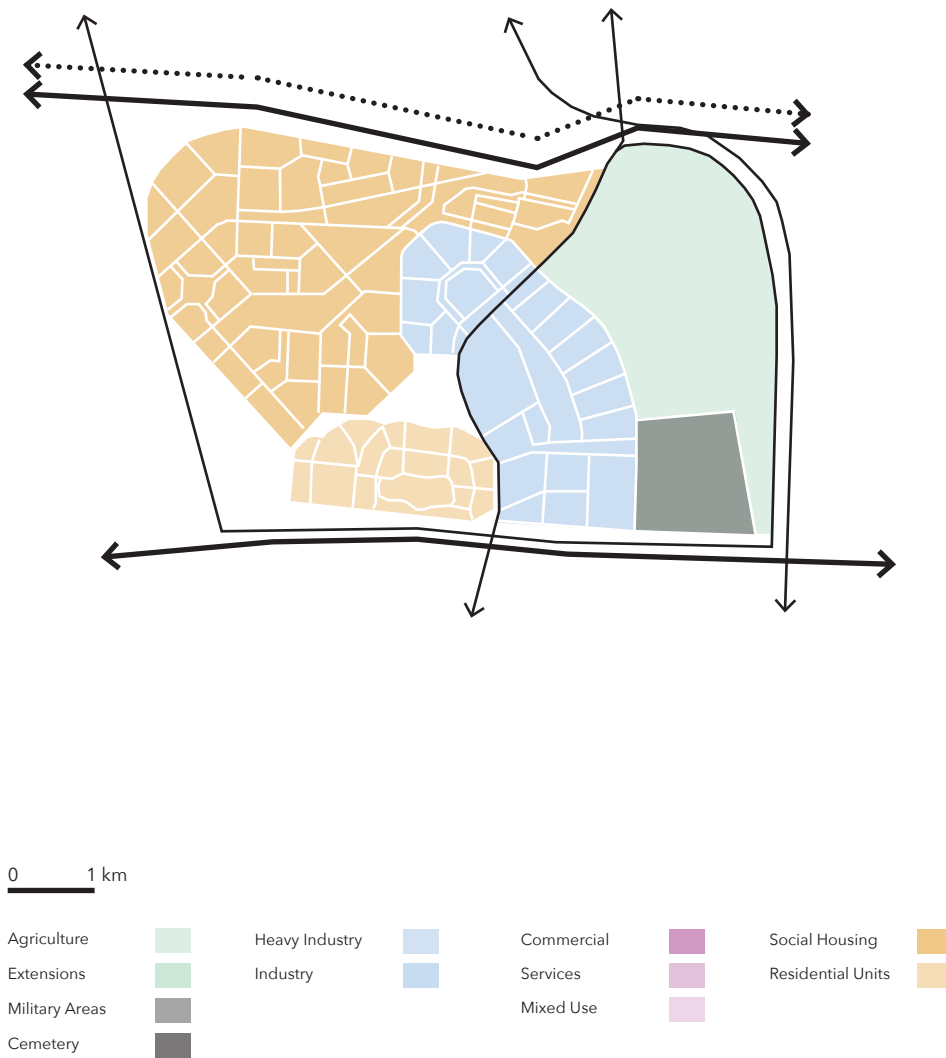
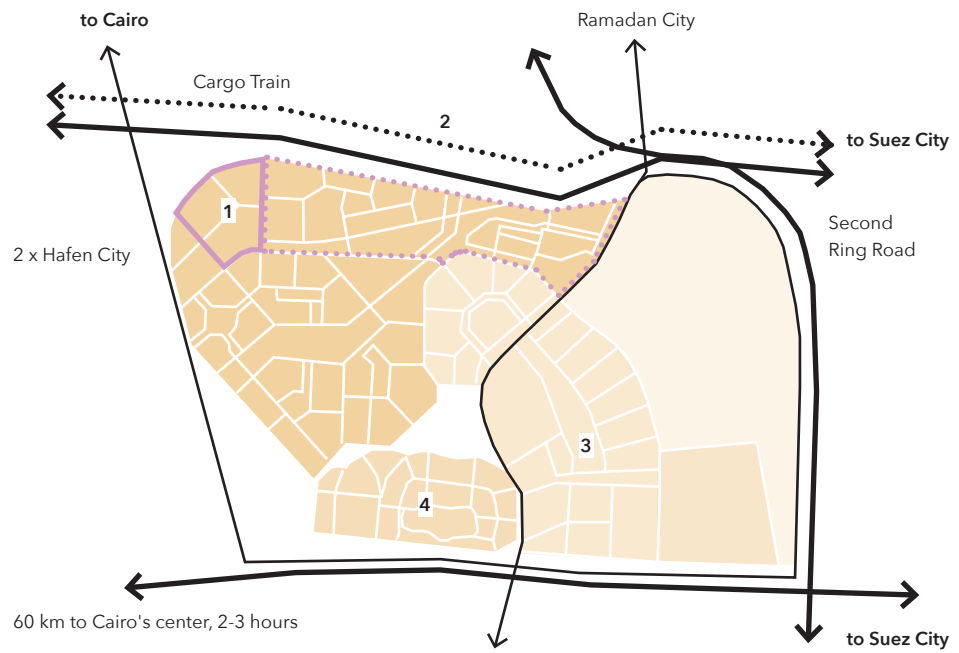


Figure 65 Zoning of Badr City. Drawing by Author

The Masterplan of Badr city illustrated in colours the different usages in the town. Over fifty per cent of Badr City targets residential typologies, from high-middle-class housing in the south to social housing units in the north and the west. The town was part of the industrial new cities plan, yet, most of its industrial plots were either empty or did not attract the targeted number of factory workers. Although figure (81) dates back to 1996, it represents the failure of Badr City in attracting workers to its industrial factories. In 1996, the factories in the city attracted only 176 workers compared to the 10th of Ramadan City, which attracted 64,591 workers in the same year.



0 1 km

1. Social Housing

2. Cargo Train

3. Industrial Area

4. Middle Class Villas



Figure 66 The Zoning of Badr City. Drawing by Author

Although Badr City did not attract the targeted number of inhabitants and industries, the State plans to extend Badr City towards the east. The extension plans to include more industrial areas, social housing units and service-delivery programmes.

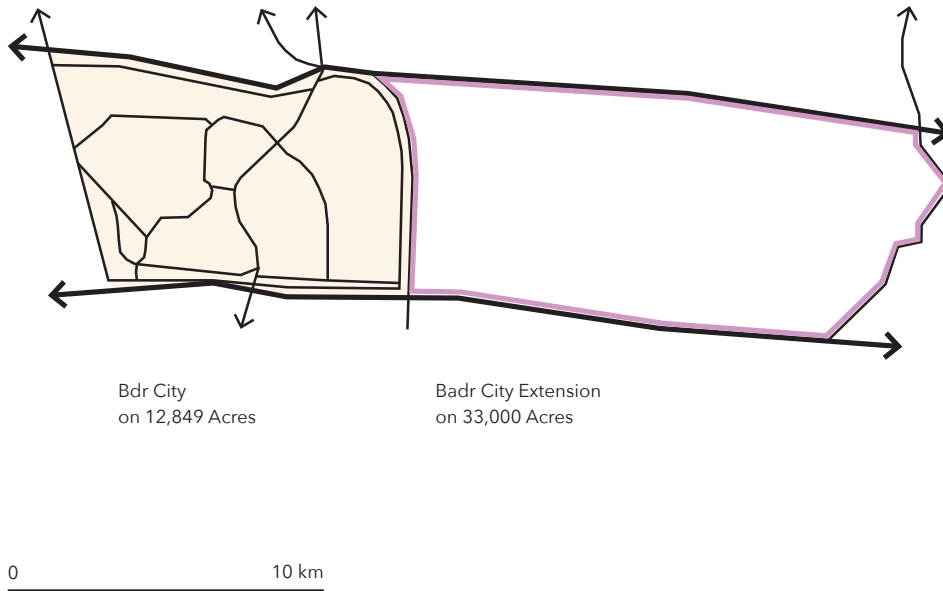


Figure 67 Badr City and its extension. Drawing by Author

2. DENSITY AND STREETS



Figure 68 The relationship between the housing units, the streets and the open spaces. Source: Goggle Maps

The low density of the built environment in Badr City is one of the main characteristics noticed when visiting the city. Especially in the State-built housing neighbourhoods, the ratio between the built dwellings and the unbuilt environment is questionable. For example, in housing estates such as Tahya Masr Social Housing Project and Dar Masr Housing Project, large areas for parking, spacious street typologies, and many unusable open spaces dominate the urban fabric.

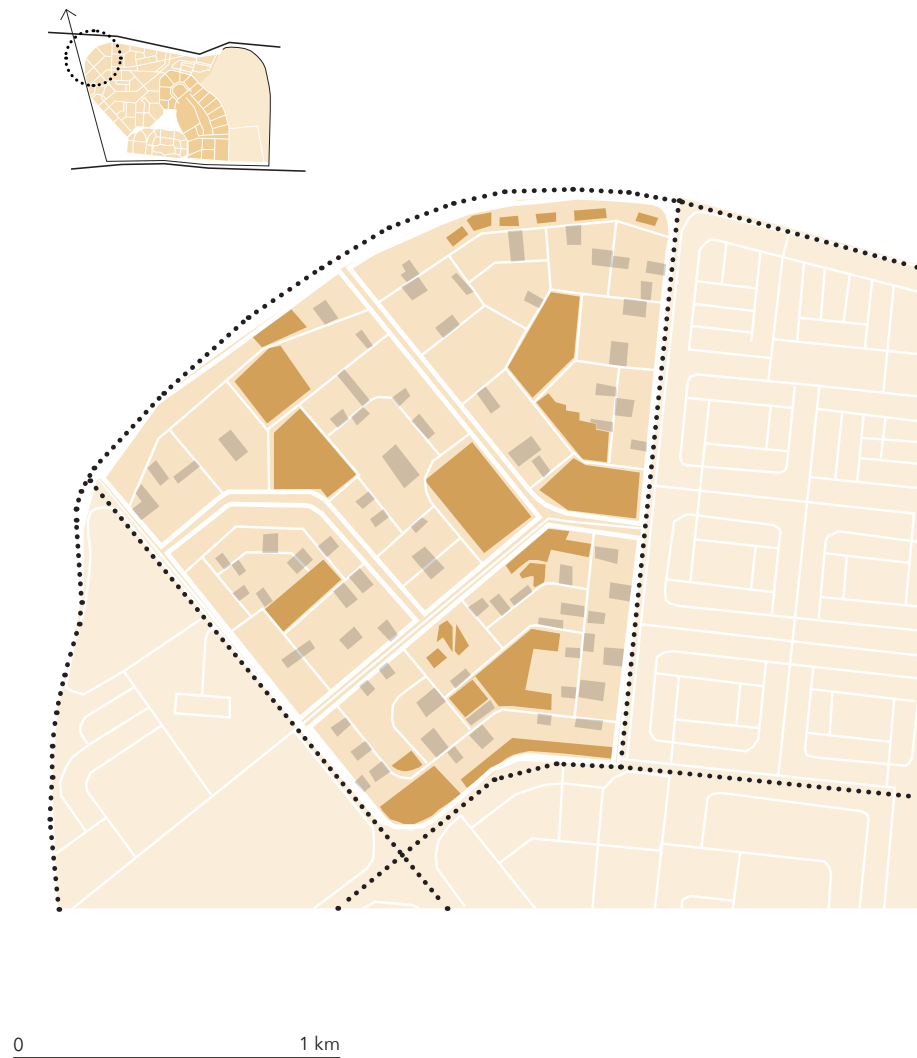


Figure 69 The Open-Spaces and Open Parking Areas in the Fifth Settlement. Drawing by Author

When analysing the Fifth Settlement in Badr City, one can notice the mono-functionality of the settlement as hundreds of H-block social housing units spread over a total area of 2 km². Figure (69) presents the ratio between the housing dwellings, car parking areas (in grey). Moreover, the built/unbuilt open spaces (in dark yellow). Mosques and some service-delivery programmes take place in some open spaces, yet, the majority of the open spaces are unbuilt and unusable.



0 1 km

Figure 70 Solid & Void of the Fifth Settlement Social Housing Estate. Drawing by Author

3. OPEN SPACES AND GREENERY

The landscape of the original Masterplan tries to cover lots of green areas, mainly on the boundaries of Badr City and in the centre, where a central park dominates the city's centre. Unfortunately, until now, most of these landscape plans did not take place, leaving the central park and the city's boundaries as an empty desert.

On the other hand, the landscape designs of the planted green spaces are questionable. The motives of these designs are unclear. When analysing various case studies in Badr City, it seems like the State does not target these areas as open spaces for people to meet and interact but as empty green areas. Shade, service deliveries, dense trees and an open space concept that targets pedestrians are missing in those open spaces. Also, this "Golf Green Area" type raises many questions about water sustainability.



Figure 71 The landscape of the Social Housing in Badr City. Source: Google Maps



Figure 72 Deserted pergola in deserted Badr City. Photo by Omar Diab



Figure 73 The landscape in Badr City. Source: Badr City



Figure 74 The Typical "Open-Spaces" in Badr City. Source: NUCA



Figure 75 The Typical H-Block Social Housing Dwelling in Badr City. Photo by Omar Diab

4. HOUSING UNITS

Although Badr City is the second furthest city from Cairo, it has one of the highest numbers of social housing units around Greater Cairo. The State has been constructing social housing units since 1982. On the other hand, the State did not invest equally in infrastructure, mixed-use programmes and job opportunities. As a result, according to the Census of 2006, the city has the second-highest rate of vacant units.



Figure 76 Copy-Paste Urbanism in the Fifth Settlement in Badr City. Source: NUCA

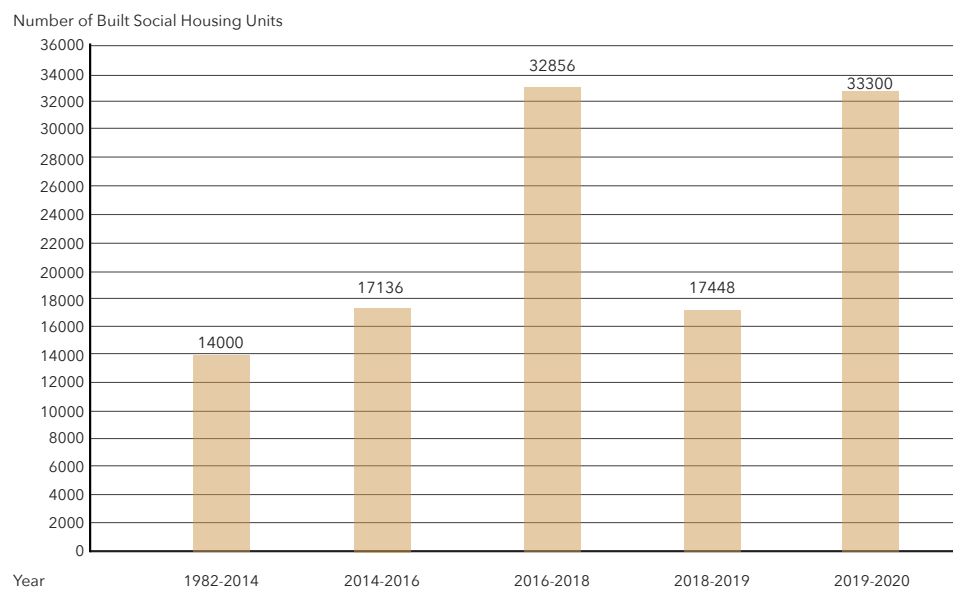


Figure 77 The amount of Social Housing Units built in Badr City in the last 40 years. Source: NUCA. Graph by Author.

Although the social housing units did not attract a fraction of the targeted population, the State continued investing in social housing dwellings like never before. From 1982 to 2014, the State built around 14,000 social housing units. However, nearly 100,740 social housing units have been constructed in the last six years. Unfortunately, the NUCA seems stubborn about how social housing units should be designed and built.

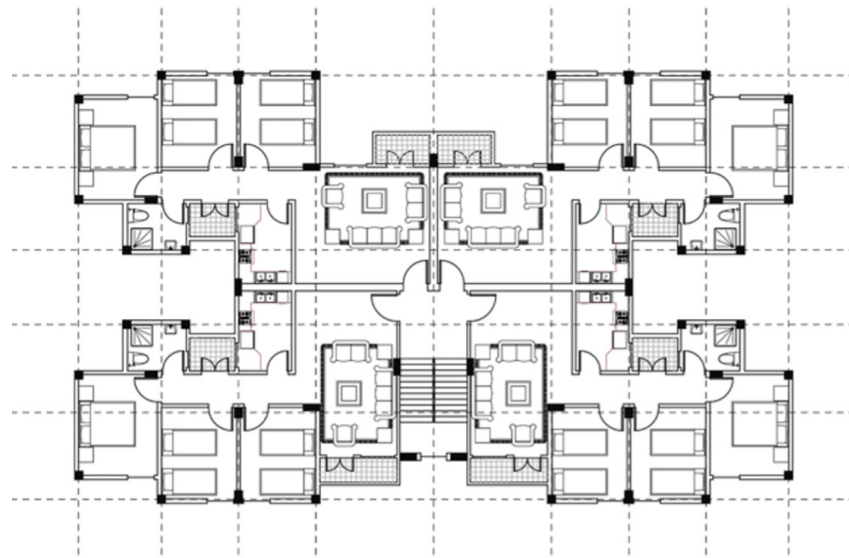


Figure 78 Copy-paste Urbanism in the Fifth Settlement in Badr City. Source: NUCA

By reading the statistics since 1982, it is clear that the proposed copy-paste urbanism did not solve the problem. It is only a fast way of producing concrete buildings that do not respond to individuals' needs. The repeated H-block over that vast area with various orientations represents the decision-making failure of the current system of producing social housing.

By interviewing several residents in Badr City, it came out that many find it hard to relocate to Badr City due to its mono-functionality.⁴⁴ It is hard for many individuals to accept that the ground floor could not host service-delivery programmes, creating neighbourhoods with only residential use. On the other hand, the NUCA explained that the State does not allow service-delivery programmes to take place on the ground floor of the dwellings to minimise the chance of creating "informalities". They added that the State plans to build several shopping malls in the open spaces in the housing neighbourhoods.

One of the influential factors in social housing production is speed, where the State has short-term interests for publicity (PR) reasons. Each mono-functional H-blocks that are copy-pasted all over the area comprises six walk-up storeys; each floor has four identical 90m²-sized units. As stated by several interviewed people, the typology of the architecture does not target different needs. The architecture lacks flexibility, offers only one type of domestic space, and lacks a diversity of size and typology.



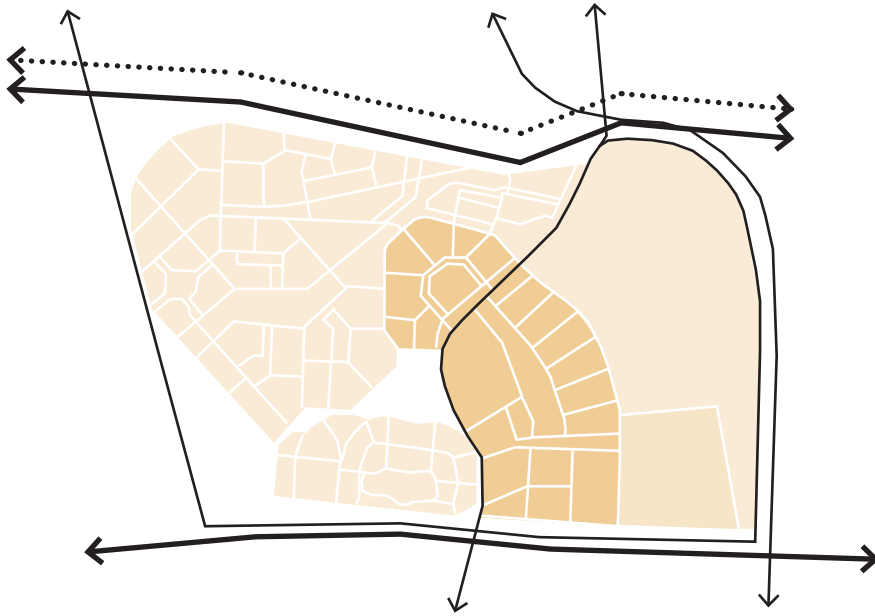
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Figure 79 The typical H-Block Social Housing Dwelling in Badr City. Drawing by Author

5. THE INDUSTRIAL AREA

Although the industrial area in Badr City takes place on nearly 12.5 km², most plots remained unbuilt for forty years. No official statistics represent the number of factories in service in Badr city, yet, by visiting Badr City, one can notice that many factories are not in service. Figure (81) illustrates how Badr City's industrial park has failed to attract workers since 1996. The city had the lowest success rate among all industrial cities around Greater Cairo, not only in attracting new residents but also industrial workers.

According to the interviews, the lack of infrastructure and poor transportation were the main reasons behind the unattractiveness of Badr City for both residents and workers. Adding to that, at a short distance from Badr City is the 10th of Ramadan City. That is the most prosperous industrial city around Greater Cairo. Was it wise to add industrial programmes to Badr City? Was the location of Badr City correct?



0 1 km

Figure 80 The industrial area in Badr City on 12.5 km². Drawing by Author

	Target Population	1996 population	Industrial jobs in 1996
10 th of Ramadhan	500.000	47.839	64.591
6 th of October	500.000	35.477	27.809
15 th of May	100.000	65.865	222
Badr	250.000	248	176
Sadat City	500.000	16.312	8.808
El Obour	250.000	no data	no data

Figure 81 Lack of Progress in the Desert Cities around Cairo. Sources: Stewart (1996), CAPMAS, 1996a, CAPMAS, 1996b and Denis (1999b). Table by Author

The industrial area in Badr City is also not supported by an infrastructure that helps it develop. The location does not support industries with a mobility network to mobilise cargo efficiently. In the interviews, some criticised the industrial city for not having international ports. Also, the train network is not connected to Badr. Besides, the two main highways of Cairo-Suez and Cairo-Ismailia are not close enough to the industrial area to allow flexible transportation.



Figure 82 Abounded Factories in Badr City. Source: Abdelaziem Rached, Google



Figure 83 Abounded Factories in Badr City. Source: Abdelaziem Rached, Google maps

6. THE CONSEQUENCES OF THE NEW ADMINISTRATIVE CAPITAL ON BADR CITY

After many years of constructing Badr city, the city has successfully attracted many inhabitants since 2015. Most of its workers have lived in Badr city since its construction began, thanks to the New Administrative Capital. There are more than 150,000 workers who work in the New Administrative Capital megaproject (NUCA, 2021).⁴⁵ Since most of these workers come from Upper Egypt, the Delta and other villages around Egypt, Badr city offers an ideal location. Also, it is the closest city to the New Administrative Capital, has many vacant apartments and is inexpensive.

The metro lines starting to take place in 2022 will connect Badr city with the New Administrative Capital, 10th of Ramadan city, Al-Shrouk city, Ubour city and Cairo. That could play a changing role by connecting Badr City with the neighbouring town. Also, the industrial area in Badr City would have a better chance of reviving its factories as it will be better connected.

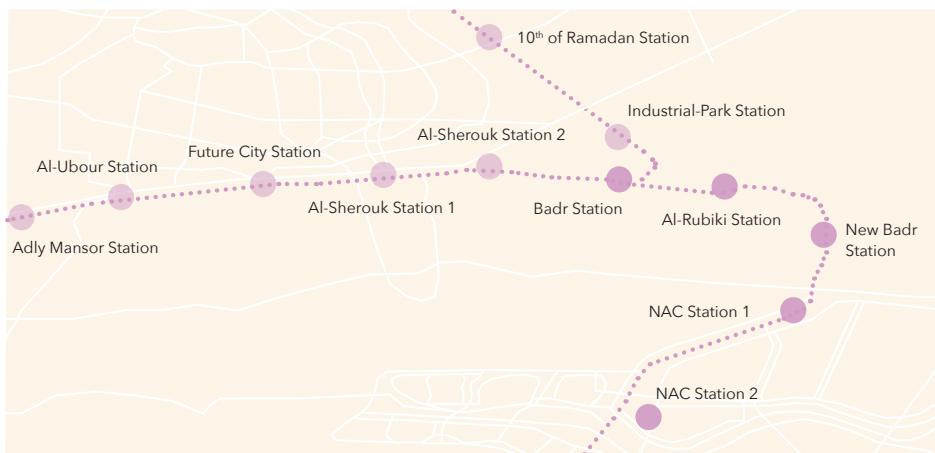


Figure 84 The Metro line connection between Badr City and the New Administrative Capital Source: The Spokesmen of the Egyptian Presidency, Drawing by Author

Also, most of the vacant social housing units in Badr city (as Dar Masr) will be given to the new government employees of the New Administrative Capital. The electrical metro will connect the residential districts of Badr city with the Governmental area in the New Administrative Capital. With all the mentioned drawbacks of the New Administrative Capital planning schemes, the city and its new infrastructures will probably play a changing role in Greater Cairo's desert cities.

Although these new urban changes might urbanise some deserted cities, there is the fear of experiencing social injustice and urban inequality as the New Administrative Capital does not offer social housing units. However, it capitalises on the vacant social housing units in the neighbouring cities. Also, the State invested in Dar Masr Project in Badr City to house more Government employees who will work in the New Administrative Capital.



Figure 85 The new Housing Units “Dar Masr” in Badr City, for the Government employees of the NAC. Source: www.almasyalyoum.com/editor/details/615 الحلیم

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CHAPTER 5 UNDERSTANDING THE REASONS BEHIND THE LOW SUCCESS RATES OF CAIRO'S DESERT CITIES

Greater Cairo's desert cities were built in different periods, with various Masterplans, sizes, urban concepts, target groups, industries and housing typologies. Although some share similar characteristics, many factors are behind the difference in success rates of the desert cities. This chapter proposes answers to the following questions:

1. How the 10th of Ramadan City succeeded in attracting industries more than any other desert city?
2. What is the logic behind the higher number of attracted inhabitants by New Cairo City and 6th of October City.
3. Why do Badr City and Al-Sherouk City have the lowest rates of the attracted population?
4. How did Al-Ubour City manage to become the central whole-sale market for Greater Cairo and the neighbouring desert cities?
5. Learning from the 10 principles of "To Build A New City In Africa"

1. LOCATION, TRANSPORT & INFRASTRUCTURE

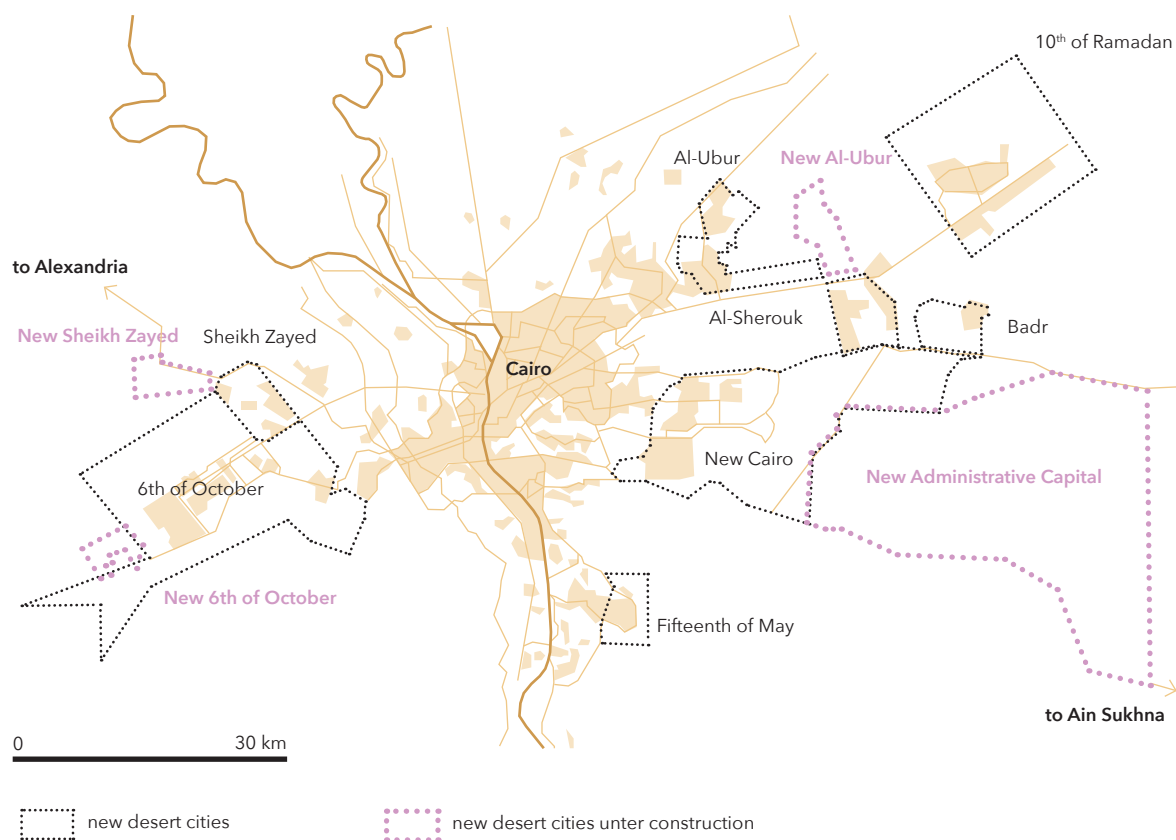


Figure 1 Desert Cities around Cairo. Drawing by Author

LOCATION

By analysing figure (2), one can notice the big difference between the attracted population in Greater Cairo's desert cities. New Cairo City and the 6th of October City have the highest rates of attracted population, while Al-Sherouk City and Badr City have the lowest results.

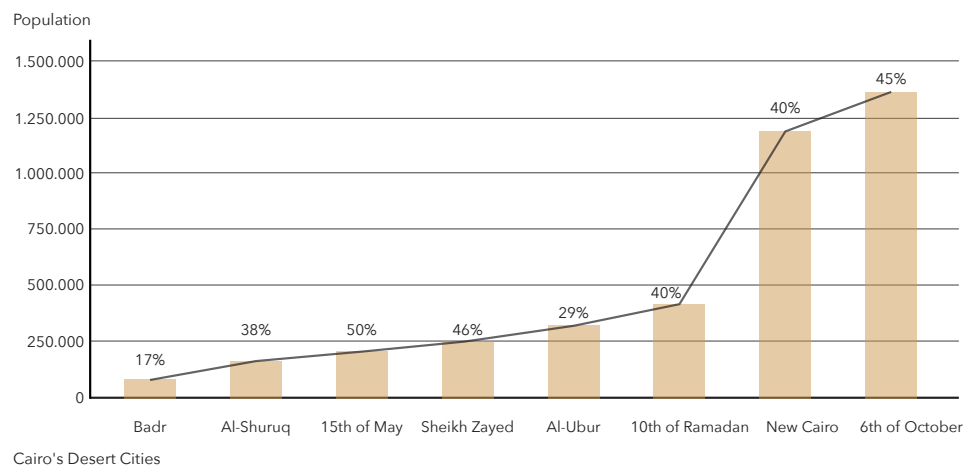


Figure 2 The number of attracted residents to the Desert Cities around Cairo and the ratio of residents compared to targeted population (Year 2014). Source: NUCA 2014. Graph by Author

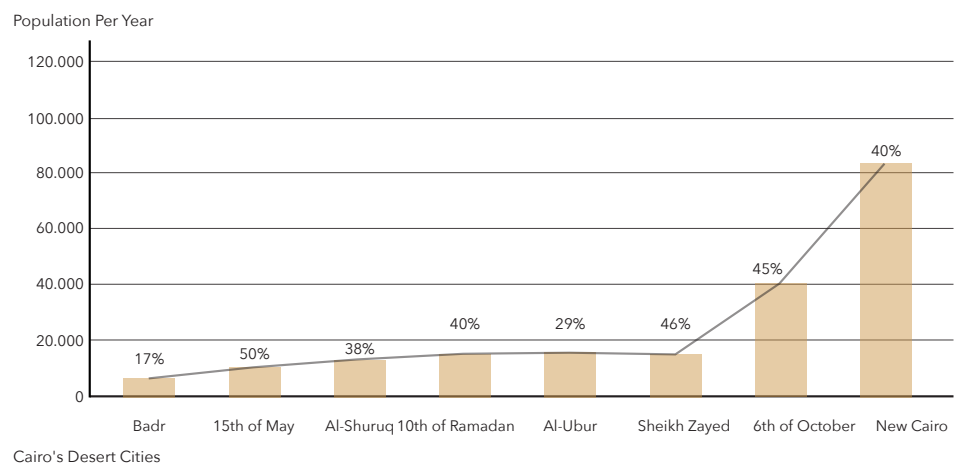
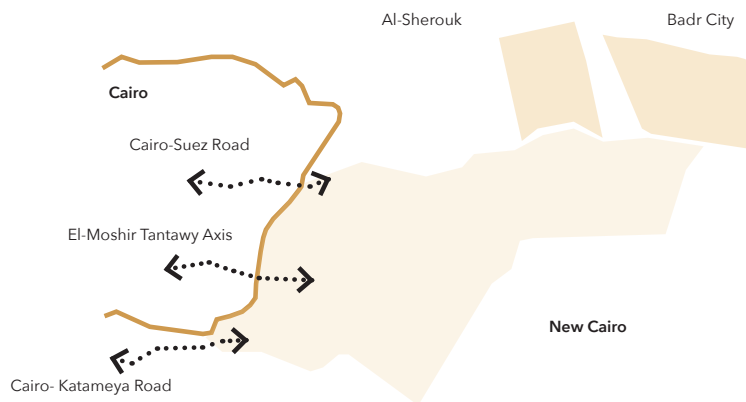


Figure 3 The number of attracted residents to the Desert Cities per year and the ratio of residents compared to targeted population (Year 2014). Source: NUCA 2014. Graph by Author



0 10 km

Figure 4 Main Roads connecting Cairo with New Cairo. Drawing by Author

The location of New Cairo City played a fundamental role in its "relative success". Figure (4) represents the proximity between New Cairo City and Cairo, where both cities share their borders. Especially three of the most populated areas in east Cairo: Nasr City, Heliopolis and Al-Maadi, are relatively close to New Cairo City.

As both cities share their borders, commuting is shorter. Also, the Ring-road supports the street network. Moreover, three well-connected roads connect both cities with the Ring-road: Cairo-Suez road, El-Moshir Tantawy Axis and Cairo-Katameya road. Therefore, Nasr City, Heliopolis and Al-Maadi have a well-connected road network to New Cairo than the rest of the desert cities.

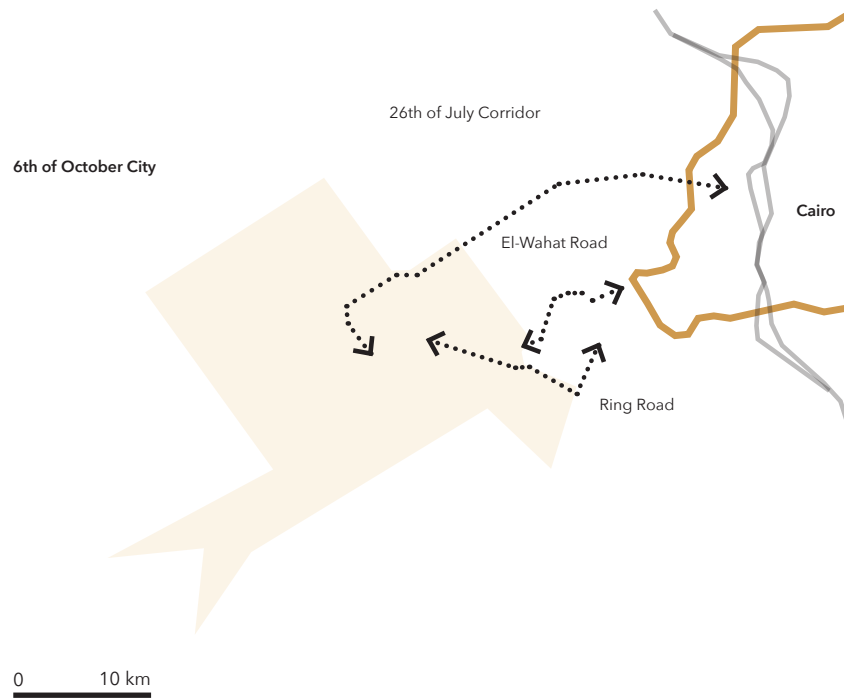


Figure 5 Main Roads connecting Cairo with the 6th of October City. Drawing by Author



Figure 6 New Cairo, 6th of October, Badr City and Al-Sherouk in relation with Cairo. Drawing by Author

As for the 6th of October City, its proximity to Giza and the west of Greater Cairo influenced many people to move to that new urban settlement for a new residential location or new working opportunities. Moreover, since the city is only 15 km from Cairo's centre and is supported by the Ring-road, El-Wahat road and the 26th of July Corridor, commuting between the city and the Capital is easy for many inhabitants/ employees.

Since the 6th of October, City and New Cairo City share the highest rates of the attracted population and are the closest to Greater Cairo, location proximity seems to have a critical influence on attracting new inhabitants to new urban settlements. On the other hand, Badr City and Al-Sherouk City are comparatively the furthest cities from the Capital. Consequently, they have the lowest number of attracted population. As a result, location seems to play a significant role in the success and failure of new urban environments.

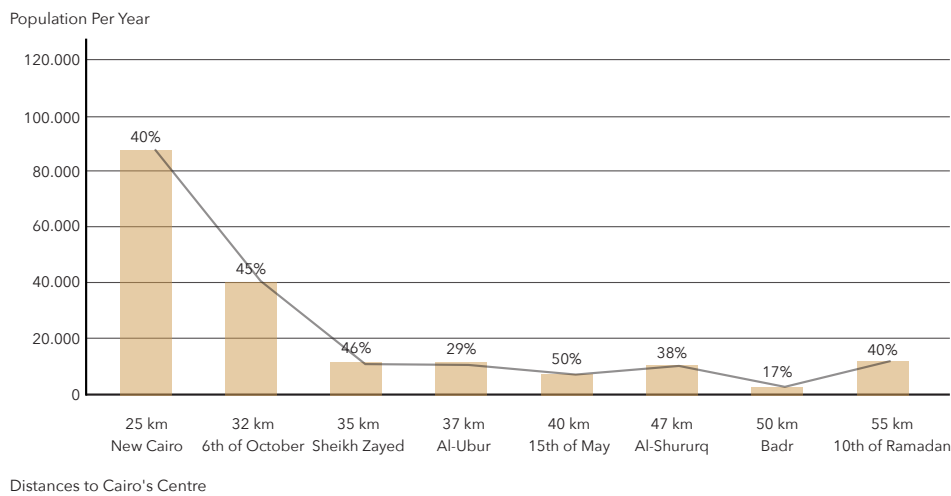


Figure 7 The Relationship between Location, the attracted number of Inhabitants in the New Desert Cities and the ratio of residents compared to targeted population (Year 2014). Graph by Author

The importance of the proximity between Cairo's centre and the desert cities around Cairo is illustrated in this graph. Cities with the shortest distance to Cairo have the highest rate of attracted population, whereas towns in the periphery have the lowest success rates. Only the 10th of Ramadan City is the exception since it is the furthest town to Cairo yet attracted almost half a million inhabitants due to its influential and self-sufficient industrial core. That has created many job opportunities and persuaded many to live there. Therefore, location is a fundamental factor that directly influences the success/failure of the new urban environment. On the other hand, a powerful self-sufficient job creation centre changes the equilibrium of location importance and attracts many residents looking for job opportunities.

TRANSPORT

"Perhaps the most serious problem facing the limited-income family who might choose to move to one of the new towns around Cairo is transport. In fact, poor transport services have for years been identified as one of the major obstacles to the development of Cairo's new towns. With the exception of Fifteenth of May and to a lesser extent al-Ubur, all new towns around Cairo are many kilometers from the city's central areas or from any existing large urban agglomerations,"¹

In Greater Cairo's urban environment, distance remains a critical aspect. Location and mobility are essential for successful urbanism. Efficient transport connections and quick and cost-effective public transport are required to incorporate the new towns with Greater Cairo completely. The government has made significant efforts to create transport routes into the desert over the years. In 1982 the State constructed the Ring Road, the primary artery in Greater Cairo, to give easy access to the new cities in the east and west deserts.²

Al-Mihwar, the corridor leading to the 6th of October, was built in 1998. Furthermore, a 5.5 km road connection was established in 2007 from Madinat Nasr to New Cairo's eastern entrance.³ These highways have enhanced general transportation in the new towns. However, even though private minibuses, employee buses and some public buses serve the new desert cities, there is a critical problem with the lack of intercity public transit.

The long distances reflect a considerable waste of time and lead to unaffordable transportation rates for the poor, low-income families living in new desert cities. The drawing boards have large transport projects (speed buses, light trains and super trams) aiming to increase public transport to new cities in the western and the eastern areas. However, the economic costs mean that these projects are either not affordable for the majority of Egyptians or that they will need to be heavily subsidised.⁶



Figure 8 Deserted Bus Terminal in New Cairo City, Third Settlement Terminal. Photo by: Abdelrahman Nagi, Google Maps

Until now, no metro lines or trains connect Cairo with the desert cities. Even if it is possible to make somehow easy, quick and inexpensive public transport to and from the new desert cities, travel in the desert towns remains a significant challenge. The problem is the distance again. The new towns are built on a scale that includes long journeys through the realm of the city. For instance, the Sixth of October covers 400 km² with a population of less than 1,2 million and almost the same area as Cairo, housing over 20 million people in 2020!⁵

Of course, such massive distances to and inside the new cities would not be difficult if everyone owned a private vehicle. Cairo's road networks could accommodate the enormous extra load. The majority of people who live in high-end residential areas have cars. However, the same cannot be said for those with modest incomes. Only 11% of households currently own some form of vehicle in Greater Cairo; hence, car ownership would remain a fantasy for decades for a vast majority.⁶

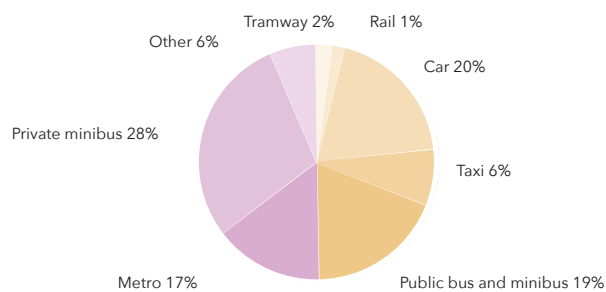


Figure 9 Passenger Transport in Greater Cairo 1998. Source: Metge, World Bank Urban Transport Strategy Review. Graph by Author

Most urban planners and senior government officials appear to escape such a reality. A private car commuter would have to think twice about the cost of living in a new city with high transportation costs. Regular journeys above 120 km are the norm, which today translate into 1000LE monthly bills for petrol alone, bearing in mind that fuel prices are strongly subsidised.⁷

2. DISTANCE TO FORMAL AND INFORMAL WORKING AREAS

Figure (10) represents the main formal industrial areas in Greater Cairo, where most industries take place in Cairo. On the other hand, some desert cities succeeded in attracting industries, like the 6th of October City, the 10th of Ramadan City, the 15th of May City and Al-Ubour City. Nevertheless, most of the job opportunities/industries take place in Cairo due to the strong presence of the "informal" economy in Egypt.

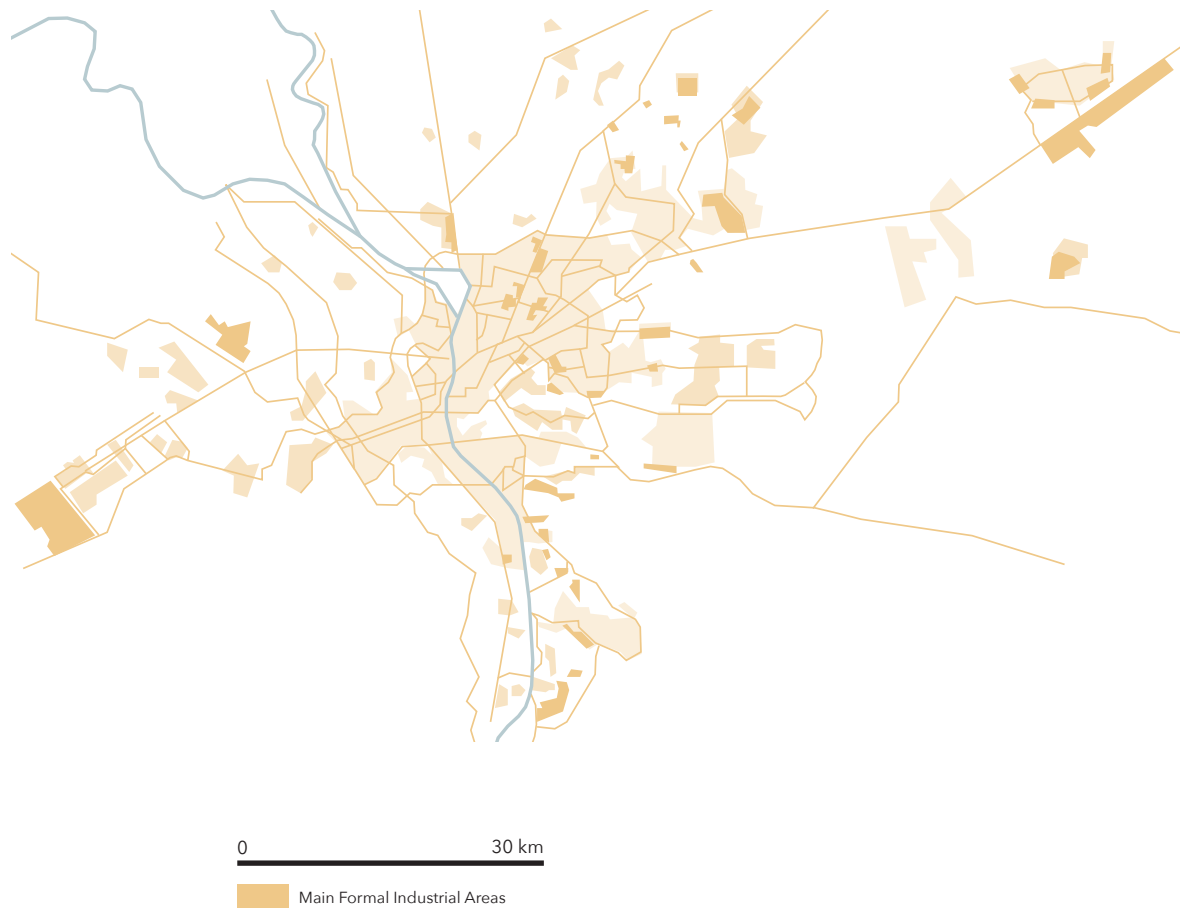


Figure 10 Main Formal Industrial Areas in Greater Cairo. By Se'journe' and Sims, 2009, Drawing by Author

"With the confusing meanings of informal jobs, it is difficult to know how many people in Greater Cairo work informally. 25-40% of all jobs in the metropolitan area may be working informally. These numbers should be cautiously addressed since there is no easy way to list informal companies. The same person might even be able to work formally and informally."⁸

Industrial areas have been developed in four of the nine new desert cities, with massive investments in factories and warehousing in the 6th of October City, the 10th Ramadan City and al-Ubur. That is plausible because the growing local capitalist market is attracted by the inexpensive land, the ten-year tax benefits, and international investors had only the option to relocate to new cities. Nevertheless, the results were remarkable as the new towns in Greater Cairo now host more than 1,500 factories with an approximate workforce of more than 200,000.⁹

From a planning point of view, the challenge with these industrial regions is that the workforce expected to live in the new cities did not move, despite the massive investments. Nowadays, crowds of buses and minibuses transport employees from "informal" Cairo neighbourhoods, Sharqiya or Ismailiya, daily to these industrial areas. Also, many factories are closed, vacant, or working at a certain amount of their capacity, because of constant problems within the industrial sector in the industrial areas in the new towns.

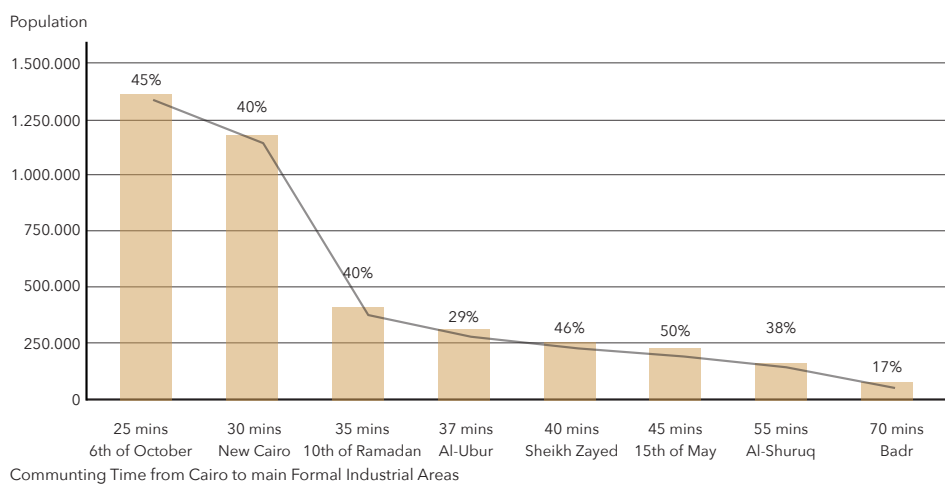


Figure 11 The Relation between Commuting time from Cairo to Main Formal Industrial areas in the Desert Cities, the number of attracted Inhabitants to Cairo's Desert Cities and the ratio of residents compared to targeted population (Year 2014). Graph by Author

This graph represents the strong relationship between the number of attracted inhabitants and the location of the main formal industrial areas in the desert cities. There is a direct relation between the commuting time from/to the industrial areas and the success of the desert cities in attracting new residents. The graph shows that as the commuting time from/to the industrial locations increases, the attracted population rate in the desert cities decreases. Badr City has the lowest number of inhabitants and is the furthest city from formal industrial areas. Where the 6th of October City has the highest population; it is the nearest city to the industries. Therefore, there is a clear and direct relationship between the availability of job opportunities and the success/failure of desert cities in attracting a new population. Thus, to convince the majority of people to move to the new desert cities, the State has either to create diverse job opportunities (not only industrial jobs) in the new urban settlements or to develop a better transportation system from and to Cairo and within the new towns.

By creating specific job opportunities that fit the new city's land resources, location and topography, the State can create various jobs that target the site. However, it is hard to achieve that since all of Greater Cairo's desert cities are built in similar conditions.

3. THE OUTDATED URBAN DESIGN CONCEPTS MASTERPLAN, OUTDATED CONCEPTS

The desert cities of Greater Cairo are very similar in their physical layout. The original Masterplans and expansion areas are designed on a gigantic scale on largely open desert areas of State land, with significant gaps between the neighbourhoods and quarters. The density of residential neighbourhoods will not exceed 50 to 70 people per acre as these areas include 60% of open fields, green spaces, playgrounds and sidewalks.

Also, the Masterplans include abundant lands for public utilities and green buffer zones with wide spaces for parking and open areas in public housing estates to separate individual dwellings. Residential street and block layouts correspond to the North-American planer's street typologies, with roadways buffered by open fields, limited entry points to control access, and circulation in the residential areas having a confusing system of curved streets and roundabouts.¹⁰



0 1 km

Figure 12 The Masterplan of Madinaty in New Cairo City. Source: Madinaty.com

Land uses are often generally designed by western planning standards. Commercial activities in nearly all neighbourhoods are restricted to shopping malls within the community block. Each new desert town has central business areas where all offices, shopping areas and government agencies take place. Industry and warehousing areas were limited to specified sites far from residential ones.

These design principles are doubtful for Egyptian urban and cultural dimensions as they are particularly questionable in the desert cities of Cairo, where the harsh desert climate is dominant and green areas need non-stop water resources.

MONO-FUNCTIONALITY AND RESTRICTIONS

Strict regulations and limited uses imposed on private housing developers by the NUCA discourage the majority of Egyptians from moving to new cities. The rules restricting population density are strict. Moreover, the large sizes of the units create expensive and challenging-to-sell residential properties. As a result, almost all private housing units on the market are unaffordable for most Egyptians.¹¹

Modest subsidised housing units in the new towns are often empty and re-sold. Even though these small housing units are relatively expensive, they do not attract most families in Cairo. Also, most buildings' grocery stores, supermarkets, businesses or offices are prohibited in the new cities.¹² In addition, workshops and maintenance facilities are uncommon in the new towns, while kiosks are forbidden. These banned programmes are activities that generate massive job opportunities and services in Cairo. Indeed, the massive "informal" micro and small business sector, which creates at least 40% of employment in urban Egypt, is eliminated from the new cities.¹³

QUALITY OF SERVICES

Although most desert cities around Greater Cairo are monofunctional, cities like the 6th of October City, the 10th of Ramadan City and New Cairo City succeeded in hosting different programmes in their urban structure. Both the 6th of October City and the 10th of Ramadan City attracted many factories and industries in their industrial zone, created many work opportunities and attracted some individuals to live in the city. In addition, the city of the 6th of October managed to create a Media City that collects most Egyptian media firms, tv channels and radio channels, becoming the centre of media production in Egypt. Also, the city managed to attract programmes like Dream Land Park, which is similar to Disney Land.¹⁴



Figure 13 Factories in the 10th of Ramadan City. Source: Google Earth



Figure 14 The American University in Cairo, in New Cairo. Source: Google Earth



Figure 15 Future University in New Cairo. Failed Architecture. "Cairo New Towns - From Desert Cities to Deserted Cities." Failed Architecture, failedarchitecture.com/cairo-new-towns-from-desert-cities-to-deserted-cities/.



Figure 16 The Media City in the 6th of October City. Source: Google Earth

The 6th of October City and New Cairo City attracted many educational and touristic investments in their Masterplan. New Cairo City has two of the most successful private universities in the country, the American University in Cairo and the German University in Cairo. In addition, it has several other universities and schools. More than five universities are operating in the 6th of October city, which attracted many families to move to the city.¹⁵

When comparing figure (17) with the mentioned information, there is probably a relationship between the notion of services in urbanism and the ratio of inhabitants attracted to the new urban environment. Therefore, New Cairo City, the 6th of October City and the 10th of Ramadan City have the highest population rates in all Greater Cairo's Desert Cities.

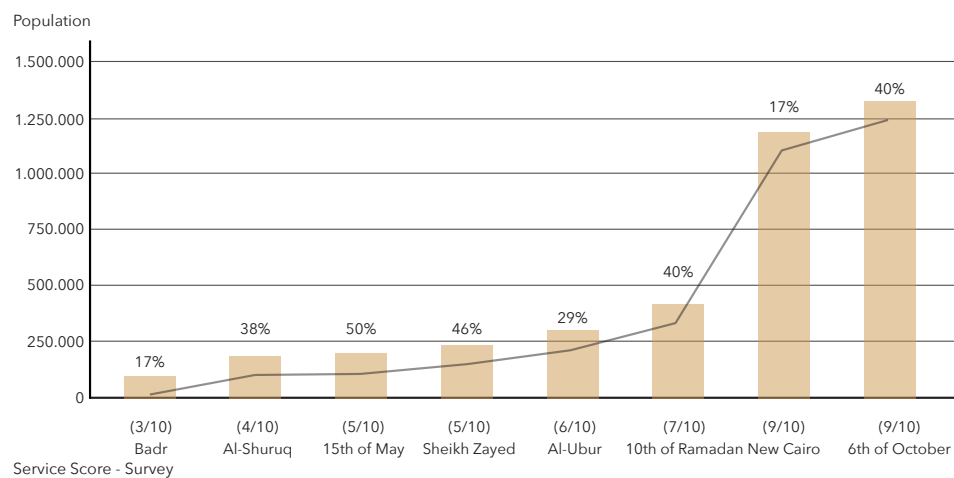


Figure 17 Relation between services in New Desert Cities, the attracted number of inhabitants to Cairo's Desert Cities and the ratio of residents compared to targeted population (Year 2014). Graph by Author

That graph represents the relationship between the number of attracted inhabitants to the new cities and the rate of city services—the rating of the mixed-use activities rates each desert city based on its various activities. The 6th of October city and New Cairo have the highest score as they host residential units, factories, offices, educational facilities, sports facilities, governmental facilities, shopping facilities, hotels, recreational facilities and cultural programmes. On the other hand, Badr City had the lowest score as it hosts only housing units, few educational facilities, factories mostly not in service and few mixed-use activities.

As represented, there is a direct relationship between the success rate of the desert cities in attracting new inhabitants and the quality of services each town offers. The graph represents how cities with high service scores succeeded in attracting new residents. As the service score decreases, the attracted population rate decreases. That is the case with all desert cities around Cairo. Only Sheikh Zayed City attracted a sufficient number of inhabitants with few services. That is due to its proximity to Cairo and its relatively large number of gated communities (mostly car owners).

4. THE URBAN BLOCK & DENSITY

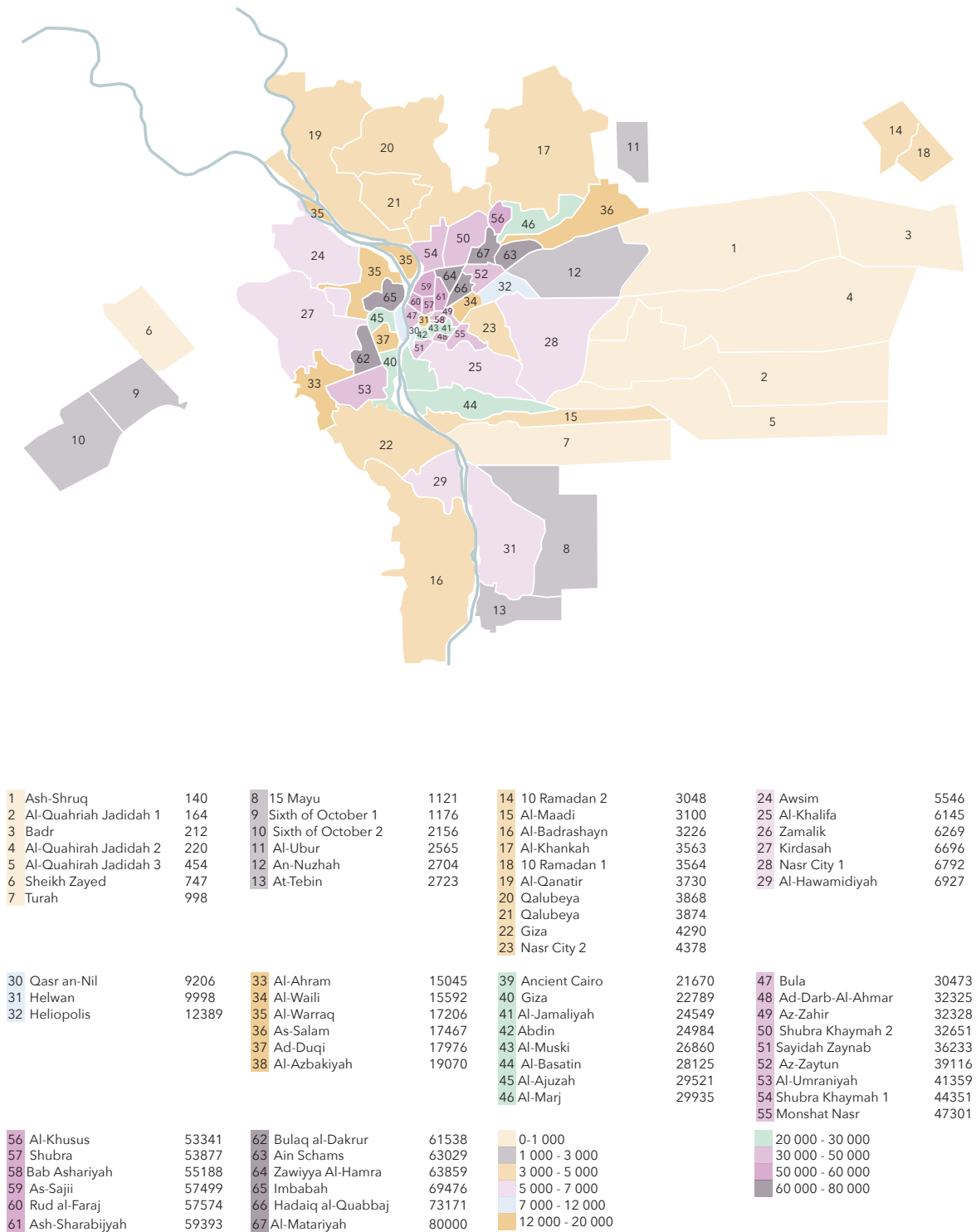


Figure 18 Population Density Map of Greater Cairo in 2016. Source: Slim Saidi, 2016, Drawing by Author

The different kinds of private compounds and neighbourhoods of low density have caused very discontinuous development in the desert cities of Greater Cairo. In reality, no logical development sequencing has occurred. The land was wholesale without any stalemate in these areas. Today, the outcome is a more uneven development with the occasional successful projects merging vast void areas with abandoned housing developments.

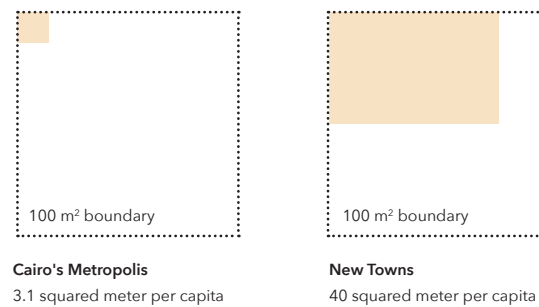


Figure 19 Density between Cairo and the Desert Cities “Place vs. Space: How Refugees Led to a Successful Public Space in Greater Cairo.” *The City at Eye Level*, 22 Jan. 2021, Drawing by Author



Figure 20 Low Urban Density and Streets Dominance in Madinaty in New Cairo City. Source: Faris El-Gwely

“Any city, even a new town or suburban subcenter, needs to develop progressively out from its initial core. City managers know that once the core has taken off, immediate fringe sites gain in value and, if well planned, a rolling program of radiating land marketing will both maximize financial returns and promote dense and logical development. Such a logic has, unfortunately, been totally lacking in strategies to develop the new towns. A clever staging strategy was used by the Belgian entrepreneur Baron Empain to create Heliopolis, a very successful streetcar suburb of Cairo carved out of the nearby desert at the beginning of the twentieth century. Apologists for the new towns frequently point to Heliopolis as an example of how it is possible to successfully urbanize the desert, noting that at the time many thought the scheme to be foolhardy and that for years it remained

a construction site. But whereas land development in Heliopolis was cleverly sequenced, the exact opposite is the unfortunate fact in the new towns."¹⁶

All new cities in Cairo have seen prolonged development, especially the individual subdivisions (privately owned), which usually constitute one-third of the total residential area of the new cities.



Figure 21 The unsuccessful land subdivision in the Badr City. Source: Google Earth

That type of land subdivision is making the success of the new towns hard to achieve. Due to the invested time and resources in the infrastructure, the land subdivision policy is costly and inefficient as it produces low-density neighbourhoods. As a result, the city's urban fabric is full of urban gaps. Unfortunately, this approach of land subdivision still seems to be favoured from the NUCA side.

As Cairo is a very dense city and has attracted many residents due to its proximity to a spectrum of services, one might think that higher density in the desert cities around Cairo would play a substantial role in their success/failure. However, this graph represents the relationship between the density of the urban environment and the rate of population attracted to desert cities. That shows that higher density does not always mean a higher success rate in attracting new individuals. For example, al-Ubur City has the second-highest density of inhabitants yet has only attracted 300,000 residents. On the other hand, New Cairo City has one of the lowest densities yet has attracted over one million inhabitants. Therefore, the density of the urban environment in Greater Cairo is an essential factor, yet it is not the fundamental catalyst that achieves the target number of inhabitants.

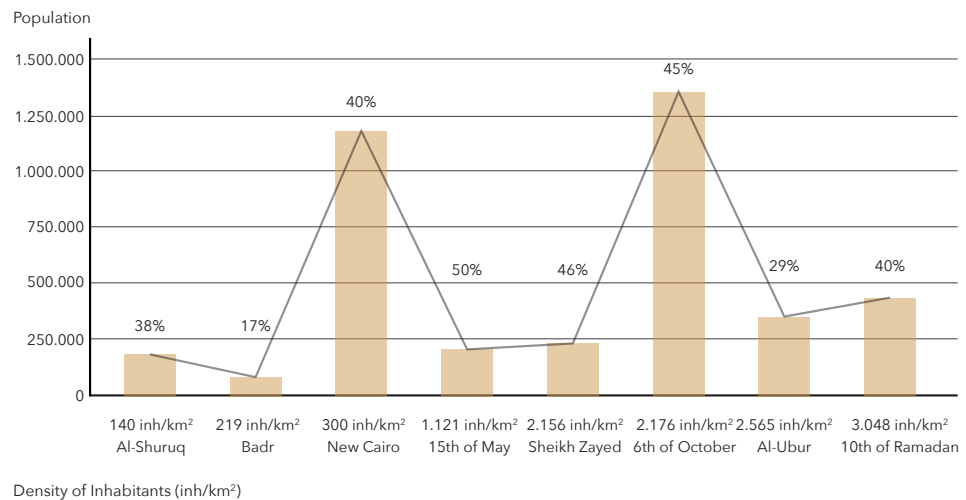


Figure 22 The Relation between Density of Inhabitants, the attracted Inhabitants to Cairo's Desert Cities and the ratio of residents compared to targeted population (Year 2014). Graph by Author

5. PUBLIC SPACES

The urban layout of the dwellings in all desert cities capitalises on low-density principles. Unfortunately, this creates large wasted spaces in the urban fabric that is not shaded and unused. That problem is common in social housing districts, gated communities and private residential subdivisions. Open spaces in social housing districts are often considered a disaster. These massive spaces between the H-block dwellings are left empty for either parking or unshaded wasted space. Private residential subdivisions are not much different. However, on the other hand, open spaces in gated communities usually host golf courses, green fields and swimming pools. That raises many questions about sustainability and wasting the limited water resources.

According to the interviews, many find that the public space in desert cities creates an unpleasant pedestrian atmosphere, where unshaded streets dominate these urban neighbourhoods. In such desert climates, shade is a critical factor that boosts communal street activities to happen. Although the State has planned some public football pitches and other street sports, the harsh climate conditions and the low urban densities are not supporting these activities to attract people.



Figure 23 Failed Architecture. "Cairo New Towns - From Desert Cities to Deserted Cities." Failed Architecture, failedarchitecture.com/cairo-new-towns-from-desert-cities-to-deserted-cities/.



Figure 24 Open Spaces In Madinaty in New Cairo. Source:Madinaty



Figure 25 Open Spaces in the Social Housing Units. Source: NUCA

6. STREETS HIERARCHY

"Arriving from Cairo, the first impression of the desert cities is one of absence: no urban cacophony, no pedestrians. No one walks here – distances are far and walking would imply that one cannot afford a car. The differences between public and private space are striking. Driving around, the city feels most like a collection of inaccessible islands of gated compounds and luxury plazas rather than a coherent whole." Says Rachel Keeton and Michelle Provoost.¹⁷



Figure 26 Failed Architecture. "Cairo New Towns - From Desert Cities to Deserted Cities." Failed Architecture, failedarchitecture.com/cairo-new-towns-from-desert-cities-to-deserted-cities/.

The analyses comparing the node/street density between Cairo and the new desert cities are in figure (27). Interestingly, the earlier-built residential districts have high node densities (280 and 221 nodes/km², respectively, for Shubra and Abbasia), indicating a high connectivity ratio. In these earlier communities, residents live in dense neighbourhoods with narrow streets and dense houses (Hemdan, 1994). In these cases, narrow streets are excellent pedestrian movement and accessibility indicators, creating better social resilience.¹⁸

The percentage of the node type has shown that the early-formed neighbourhoods have higher X junctions values, indicating higher node degree values. Thus, more network interconnections, see figure (28).

In comparison, the neighbourhoods of the new towns (1st settlement in New Cairo City and the 6th of October City) have wide streets and few nodes, opposite to the earlier urban fabric system in Cairo (Ibrahim, 2010). The new development moves to a less connected pattern, both early developments (e.g. Nasr City 93 nodes/km²) or new proposed developments (e.g. 6th of October 63 nodes/km²), which record the lowest values.¹⁹



Figure 27 Street Network Analysis for the three prototypes. Source: Ibrahim, Abdelkhalek, and Abdullah Alattar. "Street Networks between Traditional and New Egyptian Developments, Problems and Learned Lessons." *Procedia Environmental Sciences*, vol. 37, 2017, pp. . 306-318., doi:10.1016/j.proenv.2017.03.061.

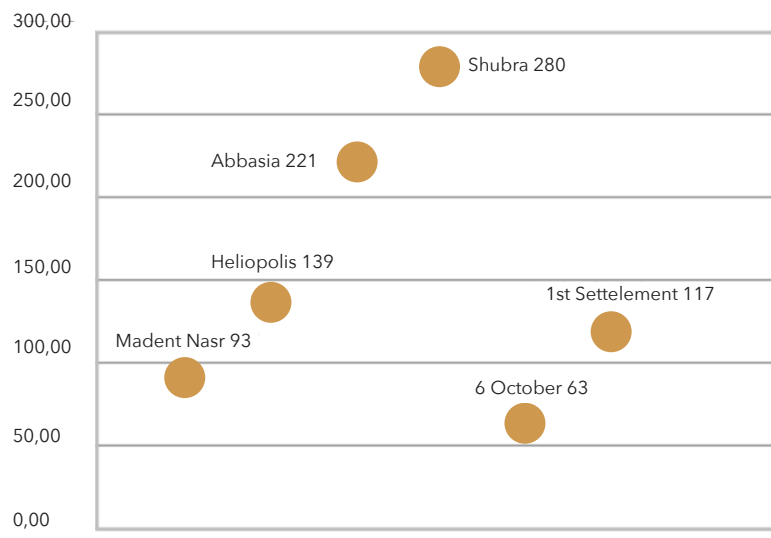


Figure 28 Node Densities. Source: Ibrahim, Abdelkhalek, and Abdullah Alattar. "Street Networks between Traditional and New Egyptian Developments, Problems and Learned Lessons." *Procedia Environmental Sciences*, vol. 37, 2017, pp. . 306–318., doi:10.1016/j.proenv.2017.03.061. Graph by Author

7. THE PUBLIC HOUSING SECTOR

*"First, in terms of attracting inhabitants, it is clear that these towns do not offer the kinds of housing, choice, and livelihoods that would entice even a small portion of the bulk of Cairene families, especially those who continue to crowd into the city's huge informal areas. The new towns around Cairo have been a main target of the government's various subsidized public housing programs, all of which are aimed at those of limited income."*²⁰

From 1982 to 2005, NUCA alone constructed 210,000 units, providing over 80% of its overall domestic production in Cairo's new cities. Also, subsidised housing developments all over Egypt created more than 350,000 apartments between 1982 and 2005. Most of these units are in Greater Cairo's desert cities, supervised by the Cooperative Housing Authority and the Housing Development Bank. In 2011, Cairo's new towns had at least 40 per cent of the existing national housing programme, which aimed to build 500,000 apartments across Egypt.²¹

By interviewing people, some pointed out that housing programmes rely on random delivery strategies, rarely correspond to the needs of the target communities, draw significant hope and lead to very poorly located housing units. From this perspective, it is no doubt that vacant units are generally over 50 per cent of the new public housing units in Cairo's Desert New Towns.²²

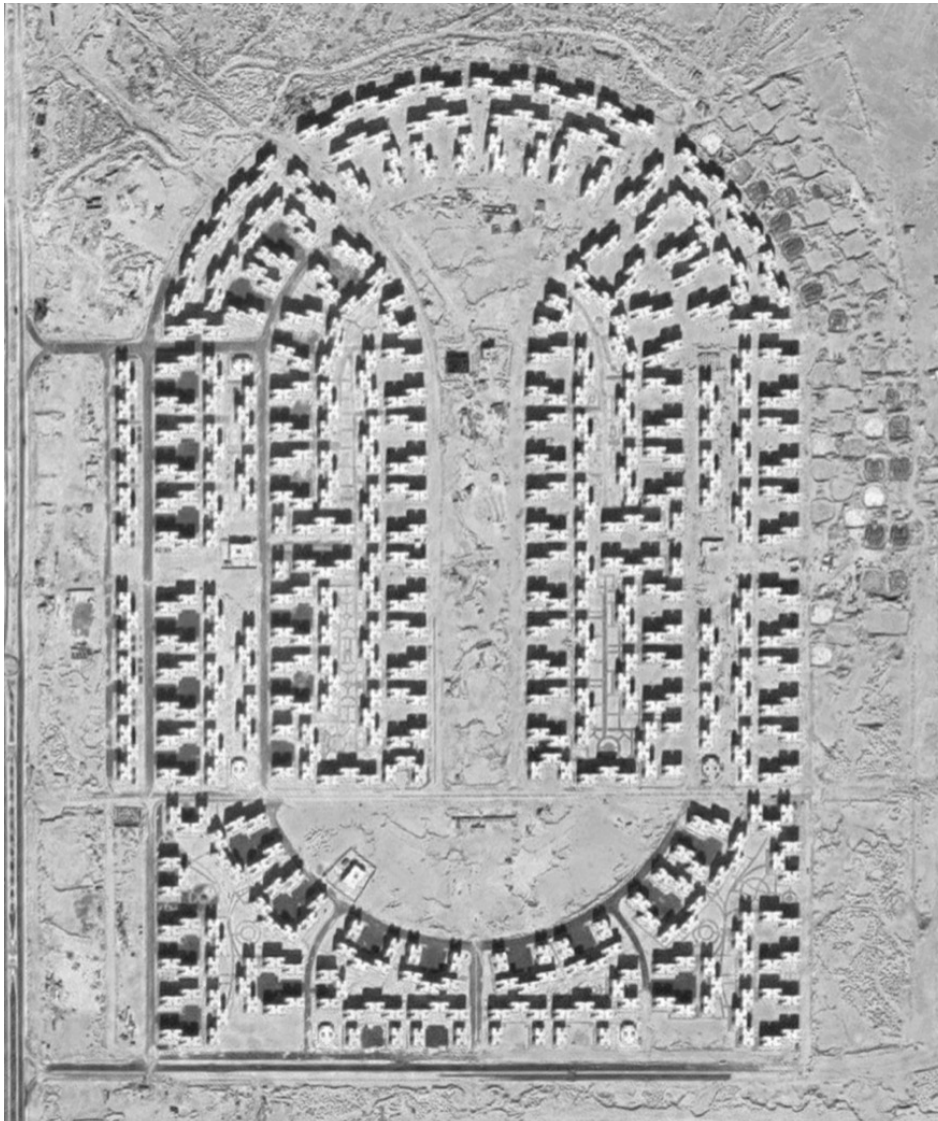


Figure 29 Masterplan of Social Housing Estate in 10th of Ramadan City. Source: Google Maps

UNAFFORDABILITY OF THE SOCIAL HOUSING UNITS

The Social Housing Program Subsidised scheme should be primarily for poor and disadvantaged families. On the one hand, it favours formal private employers or government employees over independent, semi-formal and retired workers. Also, "informal" workers would spend more than two times the down payment charged by Formal employees (Figure 30 & 31).

A-Ownership					
Sub-programme	HH Income Bands (EGP/mth)	Cost (EGP)	Cash Subsidy (EGP=)	Payment Scheme	Units Offered for Reservation in FY 17/18
A1 Subsidised SHP (90 m ²)	Min 1500 - max 4750	184,000	0 - 25,000	16-40% down-payment + 20yr subsidised mortgage at 5-7%	125,000 / 68%
A2 Unsubsidised SHP (75 - 95 m ²)	None	165,000 - 250,000	None	Cash or 25% down-payment + 3yr yearly instalments	18,061 / 10%
A3 Premium SHP / Sakan Misr (115 m ²)	None	425,000 - 575,000	None	Cash, 20% down-payment + 5yr quarterly instalments, or 20yr subsidised mortgage at 8-10,5 %	40,000 / 22%
B-Rent					
Rental SHP 2-bedroom (75m ²)	Min 1000 - Max 1450	300 /mth + 7%/yr	Imbedded	100 EGP deposit + 3000 utilities' hook-up	0 / 0%
Rental SHP 3-bedroom (90m ²)	Min 1000 - Max 1450	410/mth + 7%/yr	Imbedded	1500 EGP deposit + 3000 utilities' hook-up	0 / 0%
total					183,061 / 100 %

Table 30 Social Housing Programmes Schemes. Source: Beo. "A Million Units for Whom? Six Facts about the Social Housing Project." Built Environment Observatory , مرصد العمران, 15 Nov. 2018, marsadomran.info/en/facts_budgets/2018/05/1543/. Table by Author

Income Bracket	Max. Monthly HH Income EGP	Rate	Max. Unit Price EGP
Upper Middle Income	20,000	10.5 %	950,000
Middle Income	14,000	8.0 %	700,000
Low Income 2	4750*	7.0 %	184,000**
Low Income 1	<2100	5.0 %	

Source: CBE "Circular Modifying Mortgage Initiative for Low and Middle-income", 22.07.2017 <https://tinyurl.com/y8qamla2>

*Defined by SHF/GSF.

**Defined by SHF/GSF. Figures from most recent 9th SHP ad, 24.07.2017

Table 31 Central Bank Mortgage Initiative regulations by unit price and income bracket. Source: Beo. "A Million Units for Whom? Six Facts about the Social Housing Project." Built Environment Observatory , مرصد العمران, 15 Nov. 2018, marsadomran.info/en/facts_budgets/2018/05/1543/. Table by Author

Naturally, this negates most of the accessibility of a mortgage; just 5 per cent of units are assigned to those not formally employed during the projects' first three years. However, that increased to 19 per cent compared to today's 17/18 financial year when some conditions were modified.²³ On the other hand, the "informal" workers represent two-thirds of the workforce. Therefore, 19 per cent is still a tiny fraction.²⁴ Moreover, those who are not regular workers with a fixed monthly wage, even though they can pay large down payments, rely on seasonal salaries, which do not match the monthly mortgage expenses, even though they could pay them annually.

The SHP still discriminates against poorer families, where they pay to double the upfront deposits of the top income quintile, even if they received subsidisation (Figure 30 & 31). That obliges many individuals, mainly "informal" workers, to loan money from relatives and friends.²⁵ That loan, besides the mortgage, raises the debt load to be repaid and significantly adds to housing expenses for the neediest people.

Burden of Upfront Costs by Quintile and Employment (Cost-to-income ratio)

Sources: Income Brackets: Forecasted for 2017 from CAPMAS HIECES 10/11, 12/13 and 2015. Unit prices & conditions; SHP 9th Advertisement 24.07.2017, Note: Upfront costs for an EGP 184,000 unit are 16% downpayment for formally employed, and 40% for self-employed/ semi-formal/ pensioner, in addition to a %5 maintenance deposit.

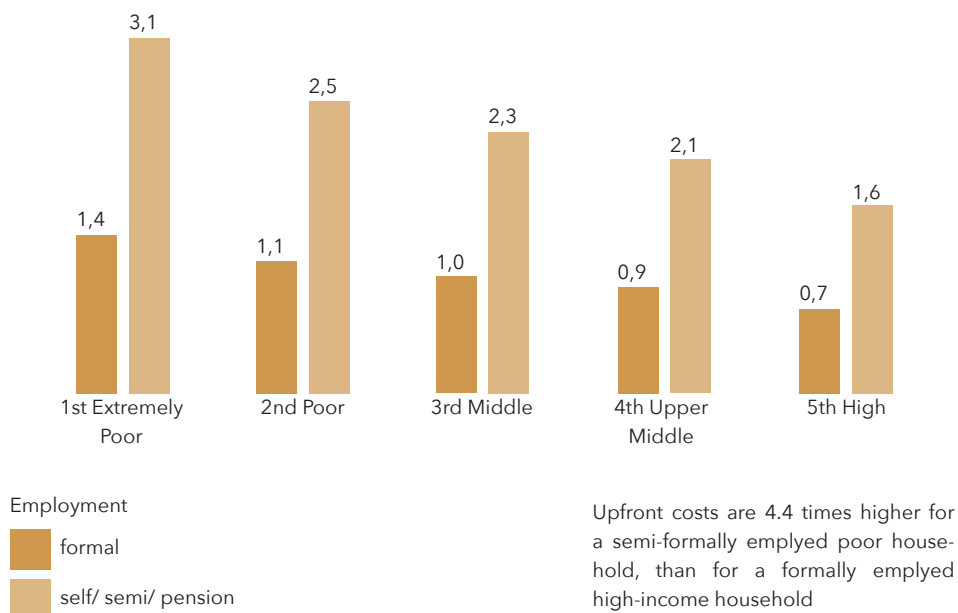


Figure 32 Cost to Income Ratio. Source: Beo. "A Million Units for Whom? Six Facts about the Social Housing Project." Built Environment Observatory, 15 Nov 2018, http://www.builtenvironmentobservatory.com/en/facts_budgets/2018/05/1543/. Graph by Author

With the rental programme now below 3% of the Social Housing Program, disadvantaged and low-income families are, as they were at the programme's origin, either under burdensome or removed from the SHP project.²⁶

On the other hand, some higher-income households violate the high SHP income ceiling and "raid" SHP units, as income declarations depend solely on reported income and not on actual income that may result from trade, remittances and rent or sale of properties.²⁷

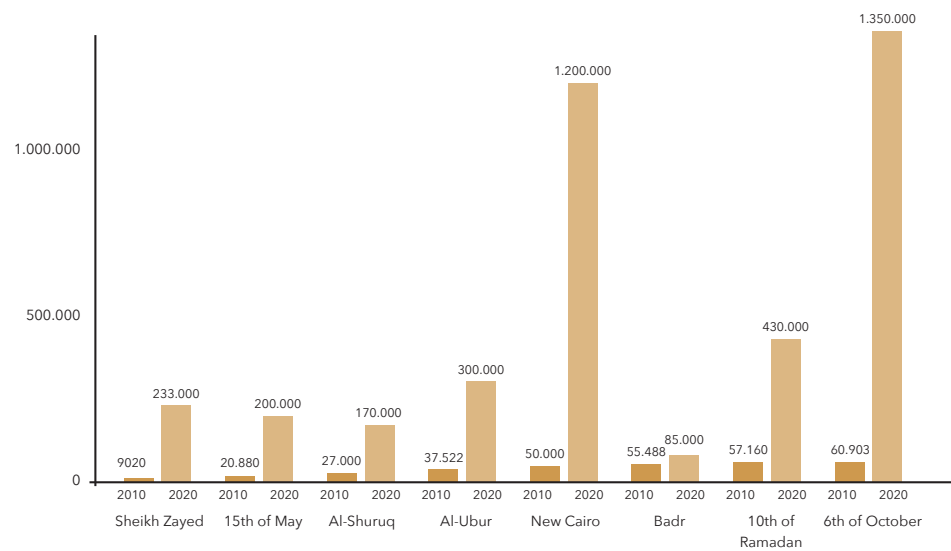


Figure 33 The Relation between the Number of Social Housing units and Inhabitants in the New Desert Cities.
Graph by Author

Comparing the number of social housing units and the rate of the attracted population to the new desert cities, one can see that the number of social housing units does not directly influence the number of attracted inhabitants. For example, Badr City has one of the highest numbers of social housing units yet has the lowest number of attracted population. On the other hand, Sheikh Zayed City has the lowest number of social housing units yet and has successfully attracted three times the inhabitants of Badr City.

FLEXIBILITY OF THE SOCIAL HOUSING UNITS

For 50 years, all governmental and private property projects have been criticised for their extravagant costs. That is no surprise, as many projects were built with international planning firms, and the core ideas did not come from Egypt. On top of these ideas is the building material. They constructed all of these projects with concrete, steel and reinforced concrete, materials that produce a lot of CO₂ and are expensive to produce. The State has taken this approach in building the physical environment as they believe that concrete and steel last longer and are more robust against environmental challenges.²⁸



.Figure 34 Reinforced Concrete Social Housing Units in Ubour City. Source: Hany
”بالصور.. وزير الإسكان: تنفيذ 26 ألف وحدة سكنية بالإسكان الاجتماعي في العبور.” زيت وسكر، زيت وسكر، 3
./Apr. 2018, www.zeat-sokar.com/8804

The flexibility of the housing typologies plays a critical role in offering a spectrum of possibilities for housing different families and individuals. Unfortunately, in the past five decades, the State and the private sector did not experiment enough with that notion. As for the public sector housing units, according to the interviews, the typologies of the residential units lack flexibility and diversity and do not respond to the individuals' needs.

Most of these housing units are two to four-room apartments. Although there is a high demand for housing units, many individuals can not afford the typical state housing typologies for many reasons (including the large apartments). Unfortunately, the State has not rethought offering studio apartments, diverse housing typologies, flexible residential units, or a flat-sharing system over the last fifty years.

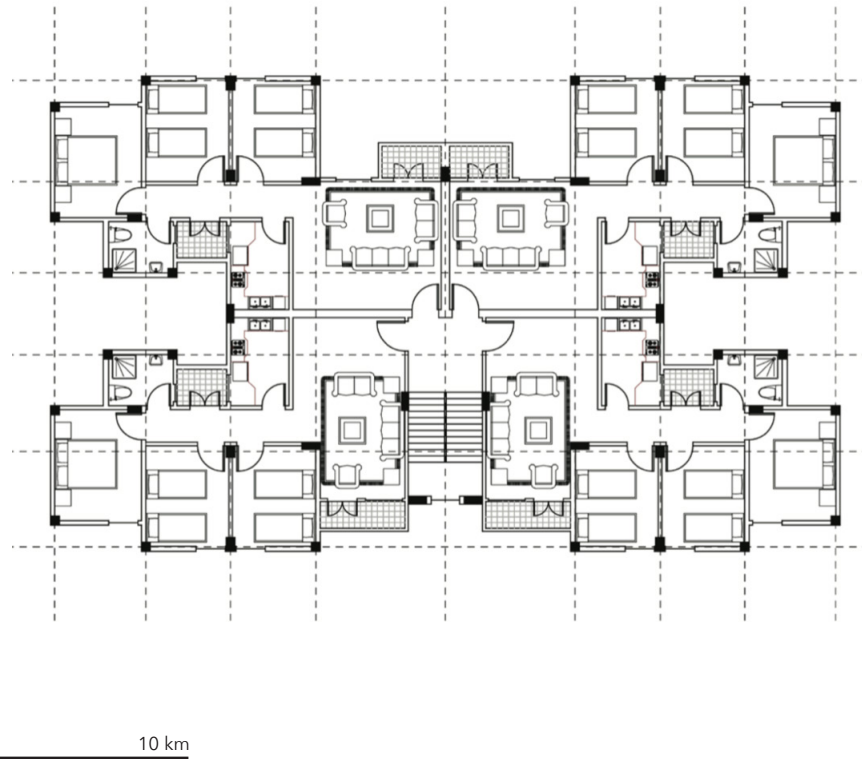


Figure 35 Floorplan of the typical Social Housing units around Egypt. Drawing by Author

By analysing the floor plan of the typical H-block social housing dwelling, one notices the notion of rigidity and inflexibility, as four identical residential units equally distribute the space. The standard floor plans also share a staircase, a narrow corridor and eight balconies, each apartment having two balconies. Although the arrangement of the residential units is very efficient in terms of space distribution, it lacks many factors that are fundamental in attracting a large sum of people. After interviewing several people, the flexibility of the units, work-home proximity, differentiation and adaptability of the architecture are critical factors that influence the usage of space.



Figure 38 Social Housing units around Egypt. Source: NUCA

THE GROUND FLOOR

The ground-floor typology plays a critical role in Cairo's neighbourhoods as it catalyses public activities and connectivity between inhabitants and the urban environment. Consequently, the dominant presence of ground-floor activities is not only present in the "informal" settlements of Cairo but also in the formal neighbourhoods.

On the other hand, ground-floor activities and service deliveries are uncommon in the social housing units in desert cities. Service delivery programmes are not allowed by the State, as the State believes that it is not hard to control in many terms. Instead, the State plans several shopping typologies like malls to control their activities efficiently. However, after speaking to several residents, many find this approach inconvenient, as inhabitants have to walk long distances or commute by car to buy their daily needs.

Unfortunately, that urban planning approach became standard in almost all new urban projects across Egypt. The consequences of that approach will create monofunctional urbanism that does not respond to individual needs and will slow down the process of attracting new residents to the new urban environments.



Figure 37 The mono-functionality of the Social Housing Units in Egypt. Photo: Omar Diab

COMMUNAL SPACES

By visiting the "informal" settlements in Egypt, one can see that the notion of communal spaces plays a critical role in bringing residents of the neighbourhood together. On top of these qualities is the sense of community, the interaction between citizens, belonging to space and a sense of ownership. In the "informal" areas, communal spaces are usually not designed, yet, they are respected and maintained by the inhabitants. They share many diverse activities, from economic activities like street markets to leisure and sports activities like street cafes and street sports.



Figure 38 Public streets offering job opportunities in Maspero, Cairo. Source: Author



Figure 39 Street markets and work-live-proximity in Attaba, Cairo. Source: <http://elsada.net/wp-content/uploads/2016/10/elsada1111about.jpg>

The urban typology of the social housing estates limits the possibility of allowing communal activities. That is not only due to the large areas dedicated to car parking but also the open spaces between the social housing dwellings that do not support communal activities in the daytime, as shading elements and trees are uncommon.

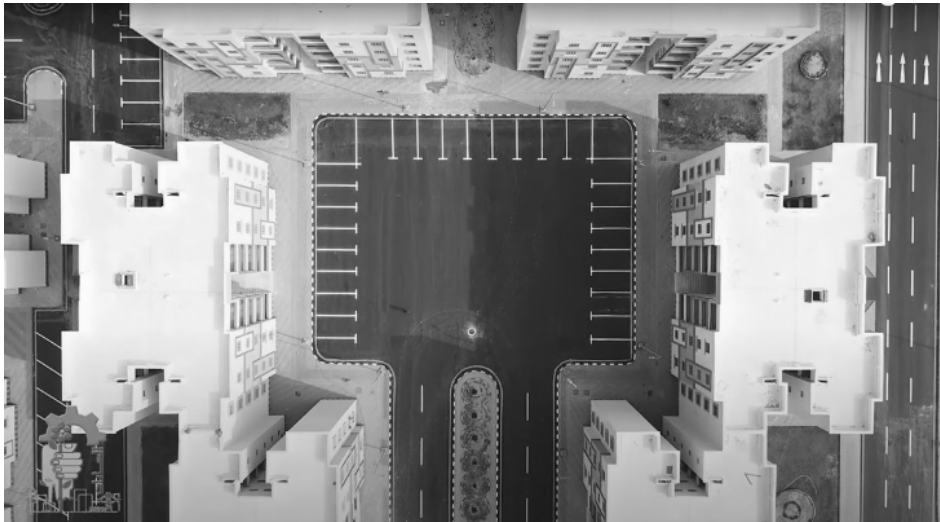


Figure 40 H Block Housing Dwelling in the Desert Cities. Source: NUCA

Also, the architectural typology of the dwellings limits communal activities, as rooftops are not allowed to be used by the inhabitants. Moreover, the floorplans are distributed space-efficient, leaving no room for communal space.

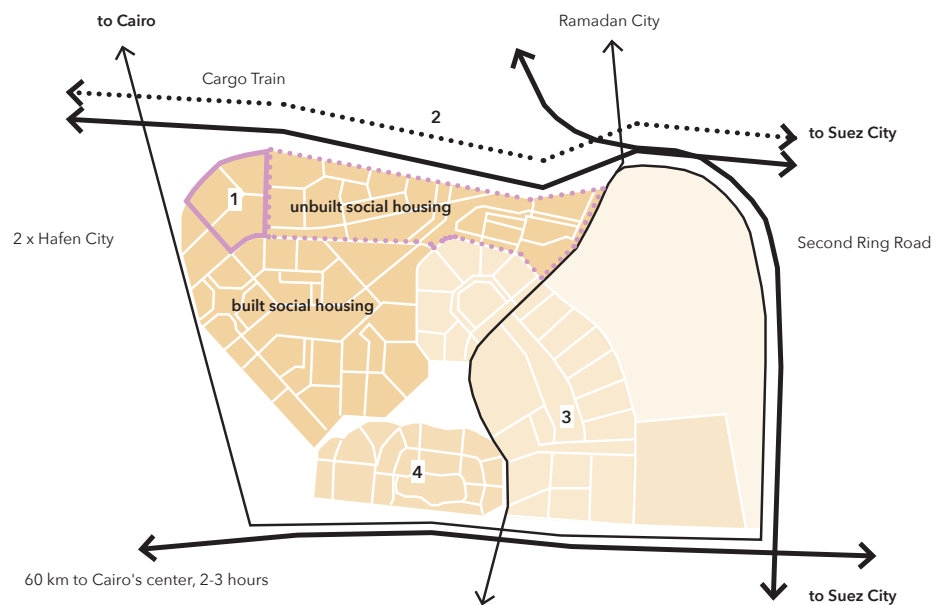


Figure 41 New Cities in the Sand: inside Egypt's Dream to Conquer the Desert." The Guardian, Guardian News and Media, 10 July 2019, www.theguardian.com/cities/2019/jul/10/new-cities-in-the-sand-inside-egypts-dream-to-conquer-the-desert.

WORK-HOME PROXIMITY

Although communal space was an important topic discussed in the interviews, the most critical feature the interviewees highlighted was the weak work-live proximity in the social housing estates. For most people, that was the main factor that did not attract them to the desert cities. Unfortunately, that scenario still makes life precarious for many residents in desert cities.

Taking the Fifth Settlement social housing estate in Badr city as a case study, the distance between working and living is 6km away from the closest work opportunity. Going to the industrial zone in Badr city is more than a 1-hour walk and 15 minutes by car. The estate is more than 60 km from Cairo, which is a 2-hours drive by car.



0 10 km



Figure 42 Distance between working and living in Badr City and Cairo. Drawing by Author

Work-home proximity is one of Cairo's fundamental features of the "informal" areas. In Maspero, Imbaba and Boulaq al-Dakrou, more than 70 per cent of the residents commute on foot due to the productive and economic platform that those areas provide. This activity consumes less time, energy and money. However, the key to work-home proximity is the range of services and commerce that sustain a socio-economic ecology, such as shops, street vendors and occasional street markets. The activities that happen at the street level are significant in creating a lively and rich public realm. In this sense, in Dr Dina Shohayb's view, "informality" is not a separate sector but a series of transactions connecting different economies and spaces.²⁹

*"My street my home"*³⁰ is frequently used in Cairo's "informal" areas. The street is an extension of the home: through communal spaces, social interactions and exchanges occur, enriching the work-home proximity conditions.

This appropriation of a 'near home environment' serves several functions at the same time. It not only compensates for limited private space inside the apartments but also helps in building community ties. When neighbours know each other, social solidarity increases, collective initiatives are easier to realise, and natural surveillance and self-policing occur. All these factors decrease the dependence on local authorities, saving the government resources.³¹

8. THE SPECULATION OF THE PRIVATE HOUSING MARKET

Even if the desert cities surrounding Greater Cairo failed to attract the targeted population, did they succeed in attracting real-estate ventures? Unfortunately, no data compares the success and failure between State Housing and Private Housing in desert cities. Nevertheless, what is boosting the real estate investors to keep investing is that they are successfully selling their projects, even if most of the units are vacant.

SMALL PRIVATE INVESTMENTS

To date, it seems that some of Cairo's desert growth remains "real," at least in some locations and segments. In other words, most of the tens of thousands of residential and business plots are still being purchased.³² The primary objective of buying property and buildings in the Cairo Desert is a speculative investment for many private families (not to mention businesses). The Capital invested in ground, bricks and concrete is considered secure and appreciates more than the inflation rate.³³ That helps understand the high vacancy rate in completed dwellings in the new cities.

*"Quite simply, there are too many pressures from special interests to capture some of this land resource and profit from it. It is revealing to see who gains such desert tracts. Either they are assigned wholesale to the well-known private corporate class, or to powerful state interests such as the police, or prominent public enterprises; or they are carved up and 'retailed' to citizens, many if not most of whom hope to make windfall profits out of resale."*³⁴



Figure 43 Private Housing built by individuals in New Cairo. Source: Sean Smith for the Guardian

LARGE PRIVATE INVESTMENTS

Most of the extensive private housing speculations were in the form of private compounds. They are mainly land allocations for developing mixed suburban neighbourhoods of 50-250 acres. Some of these have already been well managed and were quickly sold, and are very famous, like Beverly Hills, Hayy al-Ashgar, Al-Rehab City and the two Al-Rabwas. However, it is critical to note that in most recent urban real-estate projects, the traditional business model depends heavily on 'buyer financing.' In other words, a firm typically secures an area in NUCA, pays the 10 per cent down payment, and plans conceptual designs, like an urban concept for all residential areas, green spaces, playgrounds, Etc. Later the developer heavily announces the units for sale.³⁵

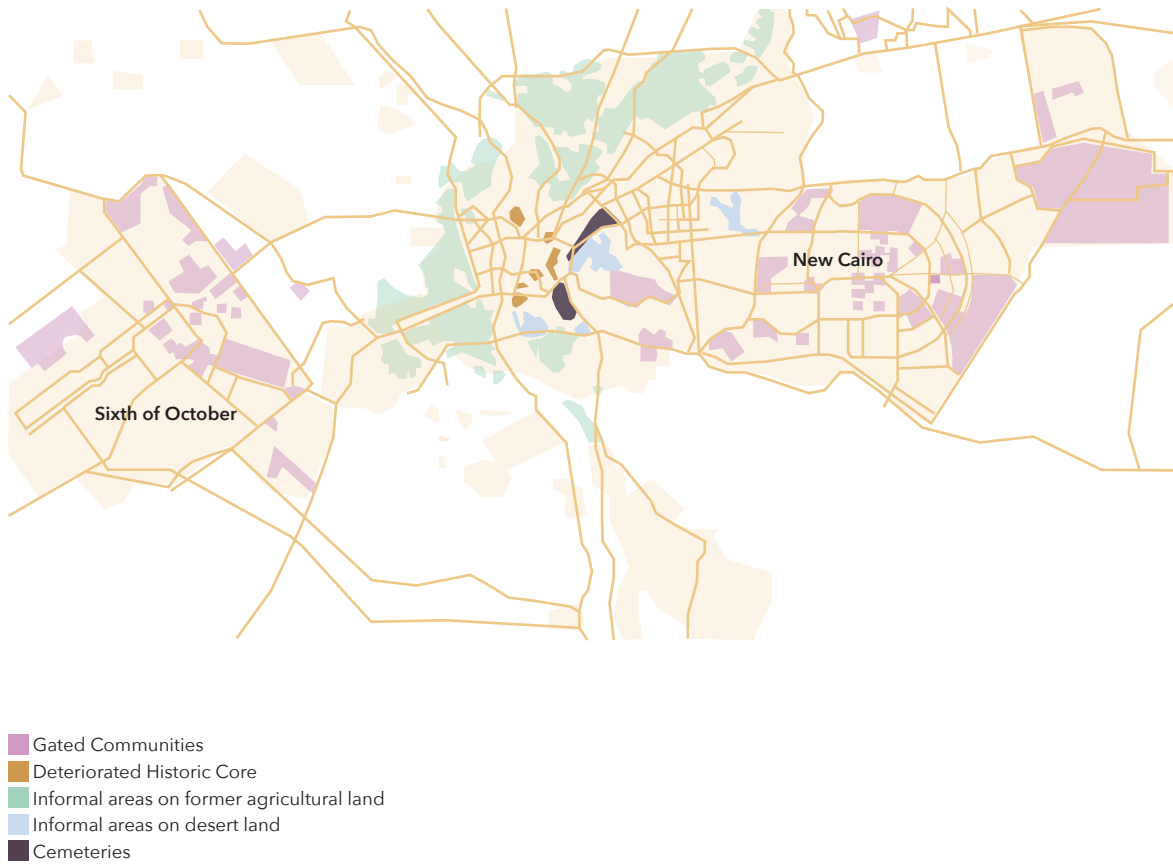


Figure 44 Gated Communities across Greater Cairo. Source: Failed Architecture, by Abdelbasheer Mohamed, Drawing by Author

Municipality	Total number of GC	GC with residential uses	GC with non-residential uses	GC Area (m ²)	GC Area (feddan)
New Cairo	237	220	17	197.038.399,99	47.000 Fdn
El Shourook	37	35	2	6.614.007,90	1.575 Fdn
El Obour	2	2	---	2.351.657,76	560 Fdn
El Sheikh Zayed	53	50	3	18.111.495,11	4.312 Fdn
Six October	164	159	5	81.732.320,22	19.460 Fdn
Total	493	466	27	612.418.800,00	72.900 Fdn

Table 45 Number of Gated Communities in Greater Cairo. Source: Ghonimi, Islam & al, ghonimi. (2013). Identification of Gated Communities in Egypt, Table by Author

Fig. (45) and (46) illustrate the strong presence of gated communities in some desert cities around Greater Cairo. Gated communities dominate in the east and west of Greater Cairo, where New Cairo City and the 6th of October City have 237 and 164 gated communities, respectively. That probably reflects why both cities have somehow successfully attracted a decent number of residents (but still not comparable to the targeted number).

When comparing the number of gated communities in the desert cities around Cairo and the rate of attracted inhabitants, it is clear that gated communities have played a role in attracting a sector of Egyptian society. The most gated communities are in the 6th of October City and New Cairo City, and both have the highest rate of attracting new residents. Furthermore, as residents of gated communities can afford to own more than one car, transportation and distance do not significantly influence their accessibility.

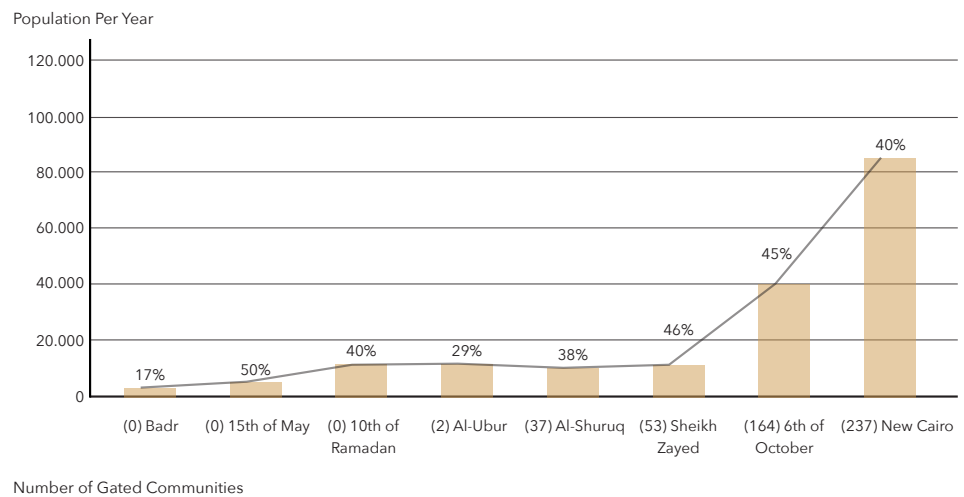


Figure 46 The Relation between the Number of Gated Communities, the attracted to Cairo's Desert Cities and the ratio of residents compared to targeted population (Year 2014). Drawing by Author

PAYMENTS

Payment plans are offered to buyers with reserve payments, further payments upon signing the contract, usually with other phased payments, extra heavy payment upon delivery of the property, and then monthly or quarterly payments for the remaining four to seven years of the buying price (These last instalments after ownership rarely are more than 20 to 40% of the overall selling price).³⁶ Adding to that, the gap between the income of the middle-class groups and the real-estate prices is still not that high compared to the Social Housing Projects.

Comparing the real-estate payment methods for middle-class to high society and the payment methods of the Social Housing Units, the high society's purchase in the power of the private real-estate developments is more facilitated than that from the Social Housing Units. As a result, most privately developed real-estate projects are sold (although many are vacant for future speculation), where most of the Social Housing Units are unsold and unrented.

THE MASTERPLAN OF PRIVATE SECTOR

Although the Masterplans of these gated communities differ to some degree, and each gated community aims to have sufficient leisure space for its inhabitants, the layout of the units in an array type is the dominant aspect of these Masterplans. The represented architecture aims at selling the project as a "dream" picture of a happy life. However, there is another dimension of segregation in most gated communities, where people are required to 'only' stay as presented in their fenced villas, where all housing typologies look alike.



Figure 47 Copy-paste Urbanism in Maxim Country Club Gated Community. Source: Maxim Country Club



Figure 48 Katameya Heights Gated Community. Source: Google Earth

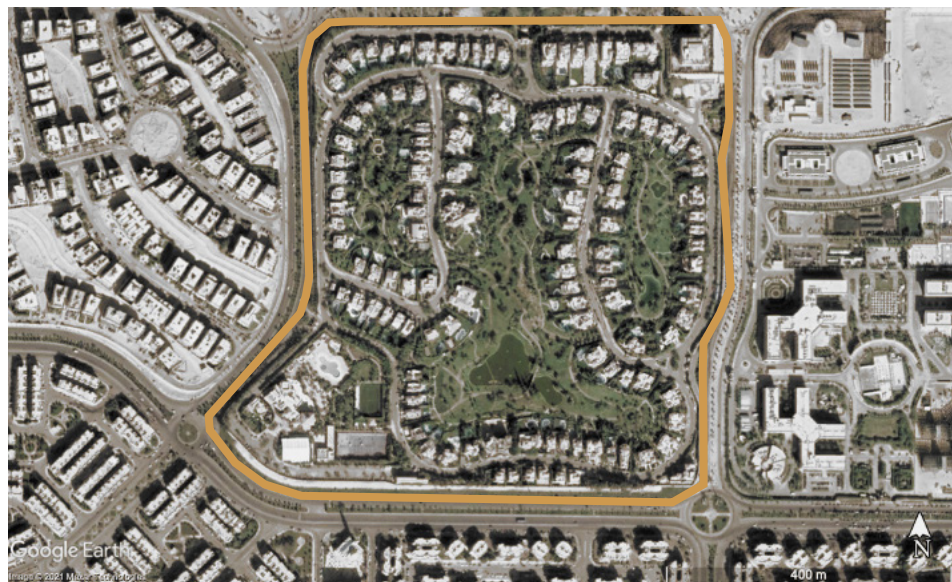


Figure 49 Arabella Gated Community in New Cairo. Source: Google Earth

SERVICES

Although most of the gated communities are criticised for their indulgence in space and resources, many managed to create a community that hosts housing units and various activities. Gated communities such as Madinaty and Katameya Heights (in east Greater Cairo) offer golf fields and many green spaces. Al-Rehab (in east Greater Cairo) offers a middle-class gated community with sports clubs, cinemas, shopping malls, schools and various housing typologies (from villas to residential dwellings). By interviewing several people living in those neighbourhoods, many believe that the offered qualities make their life much easier and less dependent on Cairo.



Figure 50 The Sports Club of Al-Rehab Gated Community. Source: Al-Rehab Sporting Club

WATER INFRASTRUCTURE

Over the last 20 years, NUCA has made special efforts to provide water sources to the desert cities around Cairo, including installing new wastewater transmission lines from the Nile. As a result, water treatment plants were installed in 2007 on the 10th of Ramadan City (also serving al-Shuruq and Badr), Zayed Sheik, the Sixth of October and al-Oubur (serving New Cairo too). All of these plants contributed to 22% of the overall water treatment capacity in Greater Cairo.³⁷

Up till now, there have been no significant water shortages. However, some observers doubt whether there is an adequate water source when development speeds up, when empty houses are occupied, and when large real-estate projects have been completed.³⁸



Figure 51 Katameya Heights Gated Community. Source: www.propertyfinder.eg/blog/en/katameya-heights-compound/.

The topic of water is barely addressed in the new desert cities. Some people wonder if we are heading towards a water crisis. The Ministry of Housing recently commissioned a study to build a new transmission line to serve all new cities in East Cairo (as well as parts of Maadi and Madinat Nasr). That will supply these regions with eight million cubic meters per day. That project opens many questions about its feasibility, especially regarding its environmental and economic dimensions.

Most water will go to golf courses, green fields, and swimming pools. Most water will not be recycled and is permanently lost in the desert. Building the power supply required for lifting such enormous amounts of water is difficult because of the comparatively high altitude of the desert cities.³⁹

10 PRINCIPLES TO BUILD A NEW CITY IN AFRICA BY RACHEL KEETON & MICHELLE PROVOOST

Both Keeton and Provoost developed a Manual that covers some fundamental planning doctrines for new cities in Africa. These principles are:

1. Planning is an ongoing process
2. Plan for adaptivity
3. No New Town is an island
4. Use no cut and paste universal model
5. Embrace new ideas
6. Infrastructure and mobility for all, from the start
7. Use a blue-green infrastructure as the central framework
8. Incorporate local cultural heritage(s)
9. Combine top-down and bottom-up
10. New Towns need diversity

The first three principles focus on location and selecting the right place for a new urban environment, capitalising on flexibility and adaptivity in urbanism, supporting long-term urban planning that evolves, and countering the traditional planning systems "finished urban product". The fourth and fifth principles try to illustrate the drawbacks of copy-paste urbanism and reinforce the notions of local planning, materials, and designs. The sixth and seventh guidelines focus on the entire city's infrastructure. Finally, the last three principles discuss the importance of heritage, local identity and the need to engage public opinion in planning the city.

1. PLANNING IS AN ONGOING PROCESS

As human needs and technologies change over time and cities are dynamic, cities need to be flexible; urban planning is an unfinished and ongoing process. Therefore, planners need to give more flexibility for future changes with different planning phases. In addition, mission statements and planning regulations require constant updates to meet future changes and needs.⁴⁰

Top-down urban planning is dominant in all desert cities around Cairo, where city designs are represented as "finished" urban products. In Cairo's desert cities, the lack of an ongoing process is a feature on the urban and architectural scale. Therefore, the bottom-up initiative has to take place hand in hand with top-down planning to achieve better results to respond to the residents' needs.⁴¹

2. PLAN FOR ADAPTIVITY

Many cities are designed as a complete geometric form or as a "finished" one-scenario model that does not give a chance for future interventions. Therefore, many towns fail to respond to the new changes (social, financial, environmental and political) that face the physical environment. Planners must leave behind the notion of a one-scenario city plan and approach urban planning differently, with more adaptation models that respond better to future changes.⁴²

In the realm of the desert cities around Cairo and the future cities that will take place in Egypt to absorb the growing population, the doctrine of adaptation needs to play a fundamental role in urban planning. As illustrated, the deserted cities around Cairo are planned at a single moment in time without respecting future changes and needs.

3. NO NEW TOWN IS AN ISLAND

Choosing a new city's location should be based on "accessibility (efficient connections to existing cities and towns), local needs, geographic conditions, the potential for growth and position in existing social, financial and production networks" (Keeton & Provoost, 2019). In addition, new cities should become part of a national plan with a sustainable mission statement to create thriving urban environments to avoid having unsuccessful islands.⁴³

Location and ineffective mobility systems were critical in creating unsuccessful desert cities around Cairo. For example, Badr City has been an island in the middle of the desert for many years. It did not attract a fraction of the planned number of inhabitants and industries.⁴⁴

4. USE NO CUT AND PASTE UNIVERSAL MODEL

New cities should respond to the cultural needs of the society (social, physical, financial and political needs). Copy-paste solutions do not solve complex challenges. Copying the American gated communities or the Chinese high-rise buildings does not serve the interest of the majority. That creates replicas of cities that function in different cultures, environments, and times.⁴⁵

Copy-paste planning is a common feature in all desert cities around Cairo. Glass skyscrapers in the middle of the desert, large green areas and many gated communities do not represent the Egyptian culture and lifestyle. Also, social housing units across the desert cities are planned in a copy-paste system, neglecting fundamental principles such as orientation, flexibility, diversity and adaptation.⁴⁶

5. EMBRACE NEW IDEAS

New technologies, innovation and ideas have the potential to shape a better urban environment. New cities in Africa have the possibility of becoming laboratories and pilot projects.⁴⁷

The current planning authorities are presenting the new cities as "smart" cities managed by sophisticated technologies for better management. For example, the New Administrative Capital is marketed as a high-tech city but is building glass skyscrapers in the middle of the desert. Is this high-tech and sustainable? Is creating the largest park in the middle east in the New Administrative Capital "smart"?

6. INFRASTRUCTURE AND MOBILITY FOR ALL, FROM THE START

Infrastructure is the blood vessels of the city. An effective mobility system is fundamental to attracting inhabitants, services and industries. "The provision of public transport within the city and to surrounding cities from the immediate start of development is the main factor in the success or failure of New Towns. Services, amenities, and public transport should be established before housing to ensure the livability of the development from the beginning. Transit options should not prioritise cars but should promote diverse mobilities, including slower transit such as carts, bicycles, and pedestrians" (Keeton & Provoost, 2019).⁴⁸

Recent new cities in Egypt have managed to create better mobility systems than older desert cities. That covers highways, metro lines and trains. Although this is a development in the planning methodology of the planning authorities, the New Administrative Capital's size is as big as Cairo's. It plans to absorb over 5 million inhabitants, but it has only two metro lines that intend to serve the whole city.

7. USE A BLUE-GREEN INFRASTRUCTURE AS THE CENTRAL FRAMEWORK

"Using existing green and blue (water) networks can create a resilient and distinctive organisational framework as the basis for an urban plan. Green and blue networks can be exploited to protect flooding and drought, accessible and beautiful public spaces, and leisure amenities within a New Town" (Keeton & Provoost, 2019).⁴⁹

In the context of Cairo's desert cities, some cities like New Cairo were criticised for their unwise location, as they were at a higher altitude than Cairo and the Nile; moving water daily in large quantities consumes lots of electricity. Therefore, understanding the geographics of the city could solve future challenges.⁵⁰

8. INCORPORATE LOCAL CULTURAL HERITAGE(S)

Respecting society's cultural heritage in new urban environments is critical, as it emotionally and physically bonds inhabitants to their new physical environment. In addition, designing new cities that reflect the society's culture promotes the people's identity.⁵¹

Unfortunately, new cities built around Cairo do not represent the Egyptian social, economic and architectural culture. Instead, many cities copy the "American Dream" model, where they host low dense villas and golf courses that need enormous amounts of water, while water poverty faces the country. Underground water and other sustainable water sources must be investigated, as moving Nile water to Cairo's desert cities (around 60km-100km) is expensive and unsustainable.

9. COMBINE TOP-DOWN AND BOTTOM-UP

Urban planning in Egypt is planned with a top-down methodology, with different hierarchies. "To become more resilient and fair, and to unleash the vital dynamics that can season a new urban area, New Towns should provide a more inclusive and participatory approach" (Keeton & Provoost, 2019).⁵² Planners should include future residents in the planning process and decision-making. By having public governance for new cities, democratic participation can happen, and the town's stakeholders can benefit.⁵³

In all desert cities around Cairo, top-down planning is the dominant model. When the State accepts Masterplans, they are fixed and inflexible to change. Only recently, some changes are taking place in the desert cities west and east of Cairo, as the State is constructing the New Monorail Lines. Nevertheless, the pandemic feature of top-down planning and decision-making is still dominant nowadays.

10. NEW TOWNS NEED DIVERSITY

Diversity is critical in all urban planning models. In new cities, that should be included by different residents, programmes and economics as this increases urban resilience. New towns should allow a spectrum of activities, people and programmes. New financial programmes should also help target a wide range of people to help attract a diverse spectrum of society.⁵⁴

Although most of the desert cities around Cairo are planned to have different residents with various income categories, most vacant housing units are social housing units. Due to various reasons, including the high prices of the properties and the gap between income levels and the prices, most residential units remained empty for decades. Only recently, the State, with the private sector, changed their mortgage approach. Residents can now pay their mortgage in 15 to 30 years. Could that help attract a spectrum of people to the new cities? Could the majority of Egyptians afford the new mortgage system? Will we experience fewer deserted housing units in the next year?

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CHAPTER 6

FIRST STEPS TO URBANIZING THE DESERTED CITIES

MOBILITY AS A CATALYST OF CHANGE

Any plan for the redevelopment of the existing desert cities or even for building new towns might be useless if it does not respect the complex balance of forces. Therefore, it is critical to have a design methodology that considers most of the factors that influence the efficiency of the urban environment. Most importantly: the Physical Environment, Social Environment, Political Environment and Economic Environment. The following proposed systems try to achieve better means that help create a more efficient urban design and planning process.

THE SOCIAL ENVIRONMENT

1. This environment is intangible yet, has a direct impact on the other three environments. Cultural Heritage plays a critical role, which defines the communities' hopes, fears and aspirations.
2. The effectiveness of the educational system, healthcare system, sports and recreational facilities, and cultural and religious facilities are fundamental factors influencing the social environment.
3. The degree of social cohesion also plays an important role. It includes the cohesion between different racial, ethnic, religious and tribal groups, the family structure and cohesion, mental health, the ratio between population, crimes and prisoners and finally, the statistics of contentment and happiness in society.

THE POLITICAL ENVIRONMENT

1. Political stability: which covers both Internal and External Stability. It is affected by the level of transparency and support for the political leadership, also, the level of regional and International Stability.
2. Law Enforcement: deals with the rates of corruption, the effectiveness of law enforcement and the efficiency of the judicial system.
3. The Regulatory Environment is influenced by the level of maturity and integration of laws, rules and regulations covering all human activities. Also, the laws and regulations that affect the work of architects and urbanists, planning rules and regulations, construction and safety laws, contract laws, employment and labour regulations, and commercial and financial laws and regulation.

THE ECONOMIC ENVIRONMENT

1. The Economic system: consists of financial and economic indicators, the Central Bank and Government Financial policies.
2. The Market conditions: are affected by six factors: the demographics and the demands for employment, housing, infrastructure, energy, healthcare, education, culture and religious facilities. Then comes the potential for creating new economic activities and employment opportunities, the availability of fund

development, the customers' purchasing power, the availability of skilled labour force and the availability of resources.

3. The Government policies that affect the Economic system.

4. The Environmental factors that directly relate to the Economic system are climate change, water and air pollution and the governmental policies that support the sustainability of our environment.

THE PHYSICAL ENVIRONMENT

1. The Urban Environment: including regional planning, urban planning, urban mobility and transport, Masterplanning and urban design. Urban Planning deals with the population's needs and demographics in this case. Transportation and mobility infrastructure plays a critical role in influencing the urban quality of life and directly relate to the success and failure of many urban settlements. Also, the different characteristics, diversities and hierarchy of public spaces influence the quality of life of the individuals; it is an essential artefact in the Urban Environment.

2. Architecture plays a critical role in influencing our Physical Environment. It is the vehicle of urbanism.

3. Natural resources cover food production, renewable energy, air quality and the best use of natural resources.

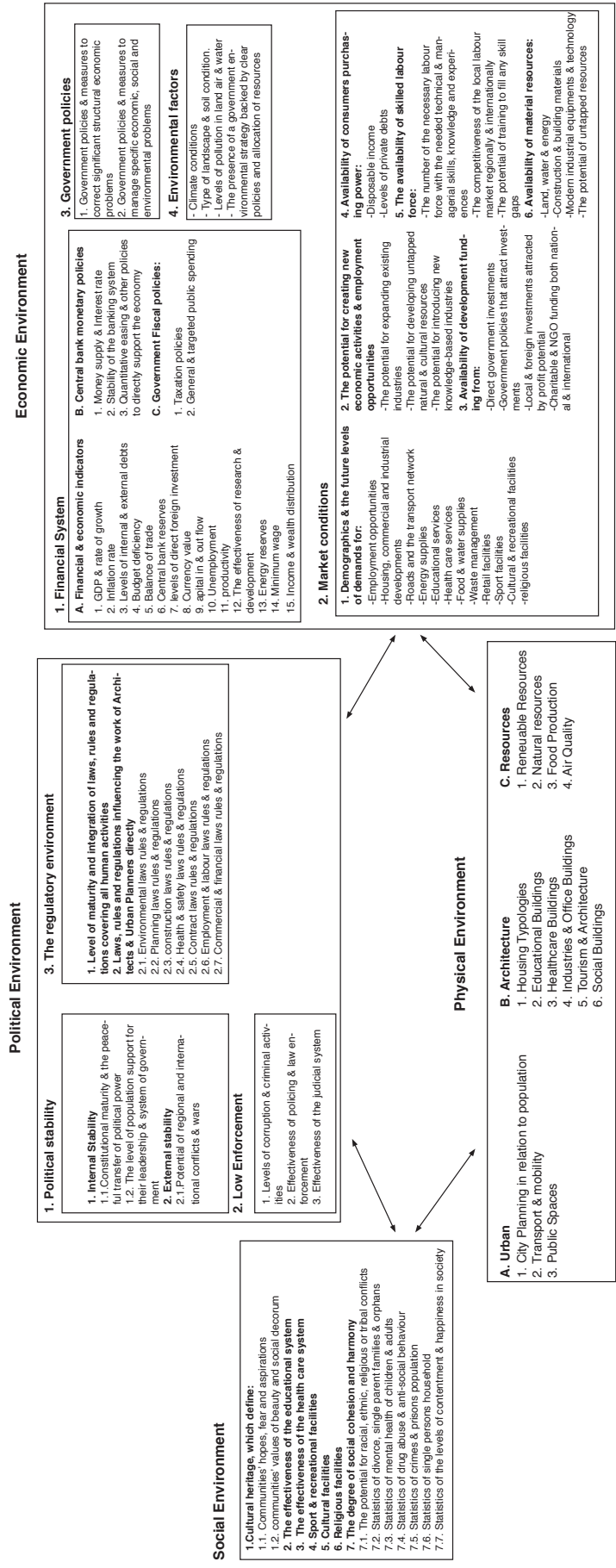


Figure 1 The Environments that influence Urbanism. Graph by Author

FIRST STEPS TO URBANIZING THE DESERTED CITIES

1. THE MACROSCALE

The first steps of the urbanisation process should capitalise on investing in technical infrastructures that are fundamental for an urban environment. As these investments need massive resources, the State should invest in some adequate technical infrastructures that allow a domino effect to take place to trigger urbanisation.

On top of these technical infrastructures is public transportation. That includes a hierarchy of mobility systems, but rail lines and stations are on top of the list as they need enormous resources. By investing in that field, stations could become catalysts to attract new people to the deserted towns and help boost a bottom-up urbanisation process by residents to deliver their needs and help counter the precarious conditions of the ghost cities.

An efficient network system between Greater Cairo and the desert cities would help people move freely. That would help house the deserted towns and create many job opportunities. Also, it would give a big chance for factories and job-creating institutes to flourish.

The macroscale in transportation is critical as it regulates mobility in the scale of the city. The State's point of view is that new trains and metro lines are hard to achieve due to the complexity of the old city, high costs, and the time needed. However, constructing over-ground metro lines in the new desert cities could catalyse change in bringing life to the deserted towns.

The Metro-Cable in the San Agustín neighbourhood in Caracas, Venezuela, is an example of how mobility infrastructure can trigger urbanity in challenging sites surrounded by formal and "informal" activities. That cable car system links existing public transportation systems and connects residents who live in areas of harsh terrains.

Five stations move 1,200 people per hour, and two stations connect to the public transit system, directly linking to the formal city. The other three stations along the mountain ridge meet the demands of local community transport needs. Simultaneously, the system acts as a framework, injecting ecological, economic and social viability into the community with plug-in programs.¹



Figure 2 The five station in San Agustín, Caracas. Source: Image U-TT

According to linear system theory, introduced by Constant (1959-1974), urban sprawl is best doable by enabling chains of settlements to grow through coherent patterns by multiple density nodes that function as centres of commerce and production, connecting dense living along a central spine. Moreover, that linear system may resolve the isolation issues of the unconnected desert cities and act as a catalyst of urbanity, density, activity and exchange.

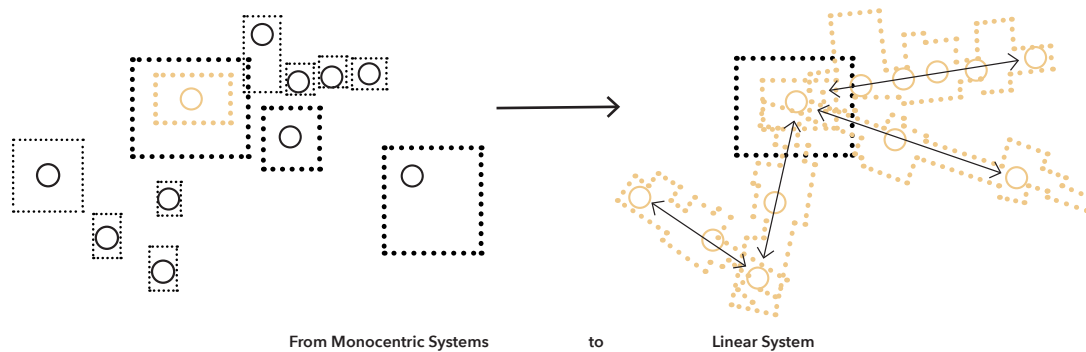


Figure 3 The transformation from Monocentric to Linear system. Drawing by Author

“We can deduce the essentials of a structure that is no longer composed of nuclei, as in the traditional settlement, but is organized according to the individual and collective covering of distance, of errancy: a network of units, linked one to the other, and so forming chains that can develop. Within these chains are found the services and everything about the organization of social life” (Constant Nieuwenhuys).²

By utilising the untapped potential of the existing railway network, there is an excellent opportunity to move large numbers of people, attract many families to the existing desert social housing units and establish these centres as economic density nodes.



Figure 4 The existing cargo train. Source: Google Maps

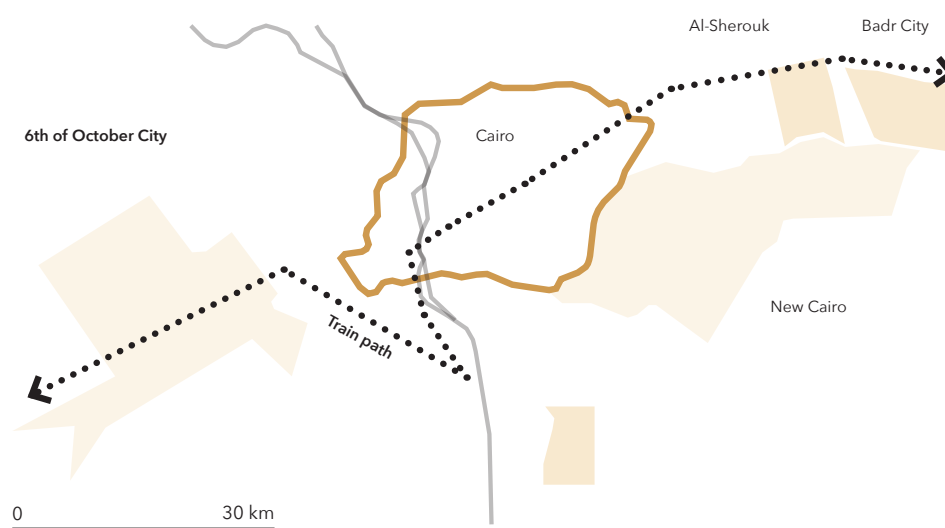
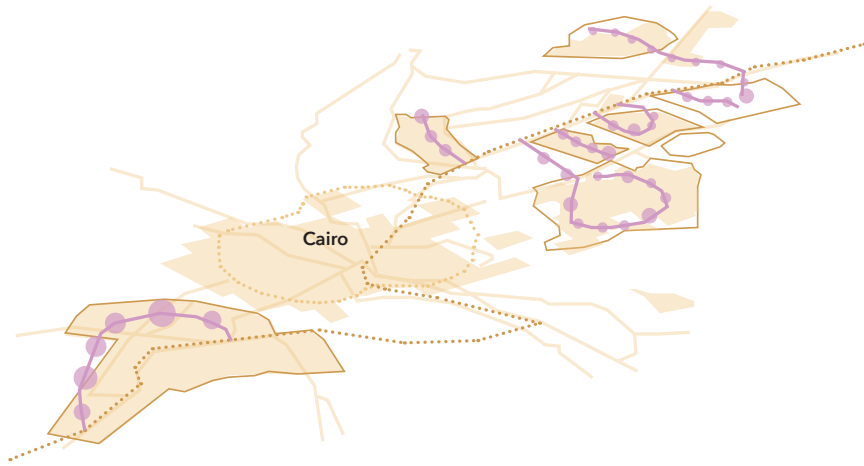


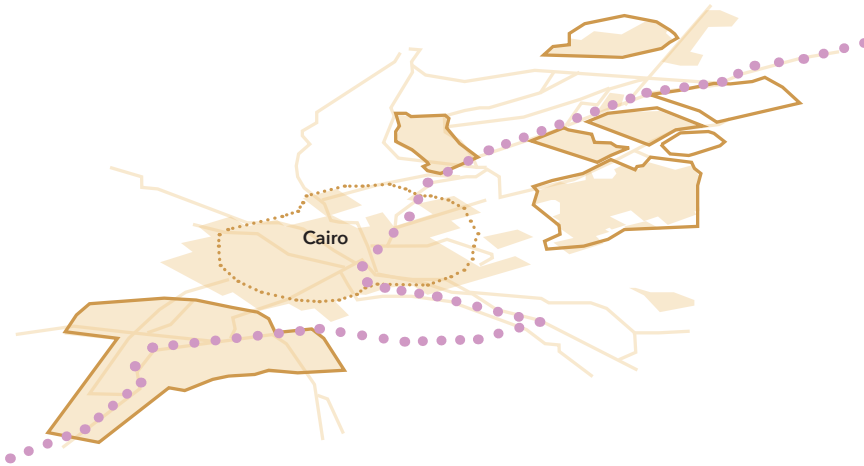
Figure 5 The existing cargo train path. Drawing by Author

Fundamental to the exploration of the linear system are the rail network (to be for passenger travel) and the new rail lines. The proposition of an over-ground metro project that would connect the new/old railways to the desert towns is fundamental to the notion of accessible public transport to the desert towns. A substantial key to sustainable urbanisation is rethinking the rail stations not just as buildings but as a district of hubs generating density, intensity, linkages, services, and synergies and allowing formal/"informal" activities to happen. The station triggers urbanisation by becoming a platform that creates interactions and exchange by better distribution of goods and services. Thus, the station should be considered as much more than a dot on the light-rail line. It should work as a complementary node generating value and triggering intensification. The focus should not be on the station itself but on the surrounding realm.

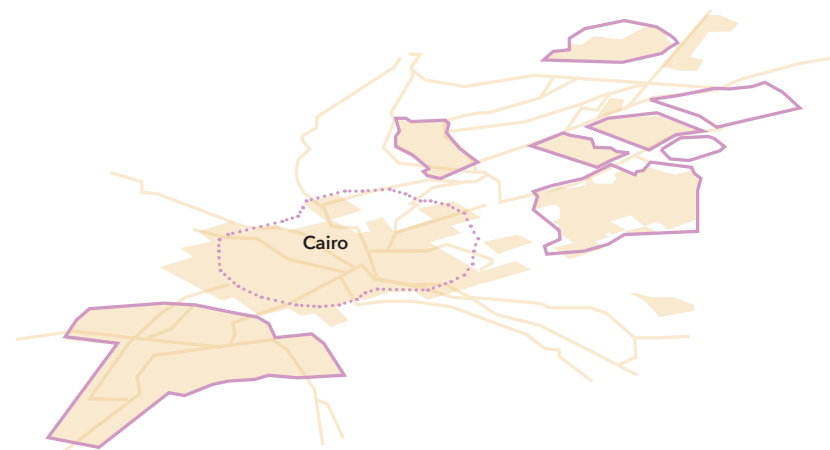
When considering that system, such districts would act as a part that offers services to the greater whole, and services would provide resources for neighbouring areas, redefining the connections between regions and composing a corridor of integrated urban areas concerning location, function and job opportunities.



Light-rail & Stations for Connectivity & Integration



Linear Mobility System



Greater Cairo's Desert Cities

0 30 km

Figure 6 The proposed connected Greater Cairo model. Drawing by Author

2. THE MESOSCALE

"Informal" transportation systems have consequently emerged following the failure of the State initiatives to meet the demand for public transport. After proving their success, the "informal" transportation system became legalised by the State and is now part of the formal transport system.

A recent addition to the extensive "informal" transportation in the past ten years is the "tuk-tuk". The "tuk-tuk" is a small vehicle imported from India. It has proved to be a practical alternative travel method because they can efficiently navigate the narrow and unpaved streets of dense "informal" areas and have very modest fares. Moreover, the Egyptian government has legalised them with formal licencing and plate numbers.

Extrapolating such bottom-up initiatives by allowing "informal" transport systems to evolve could significantly contribute to enabling desert cities to survive, grow and function as proper urban areas.

2.1 MOBILIZING BADR CITY

Badr city is an example of a large and deserted city, located 60km from Cairo, from which it takes two to three hours to commute to Cairo's centre using public transport. The main reasons behind Badr city's lack of appeal to new residents are the absence of an effective public transportation system, isolation and distance from Cairo, and, most importantly, the mono-functionality of its social housing estates.³

In order to link Badr city to Cairo, it is possible to propose a light rail that departs from the existing rail line and crosses Badr city. Under this plan, with stations every two to three kilometres, passing through social housing estates and the industrial zone, there is a chance of attracting people to the city. In addition, a series of bus routes could start to run through various mega blocks to connect the neighbouring areas with the light-rail station. Furthermore, the proposed mobility system would capitalise on the existing vacant factories and housing units as a substantial key towards retrieving the city by generating housing and job opportunities.

Since much of Badr city is composed of deserted social housing estates, a key question is how transport infrastructure would generate different forms of urbanity. Most of the city's housing estates took place over ten years ago, yet, ninety per cent of the units are unoccupied. Zomoroda housing estate in Badr City is a pilot exploration of a typical social housing estate with its 620 mono-functional copy-pasted H blocks deployed over its territory.

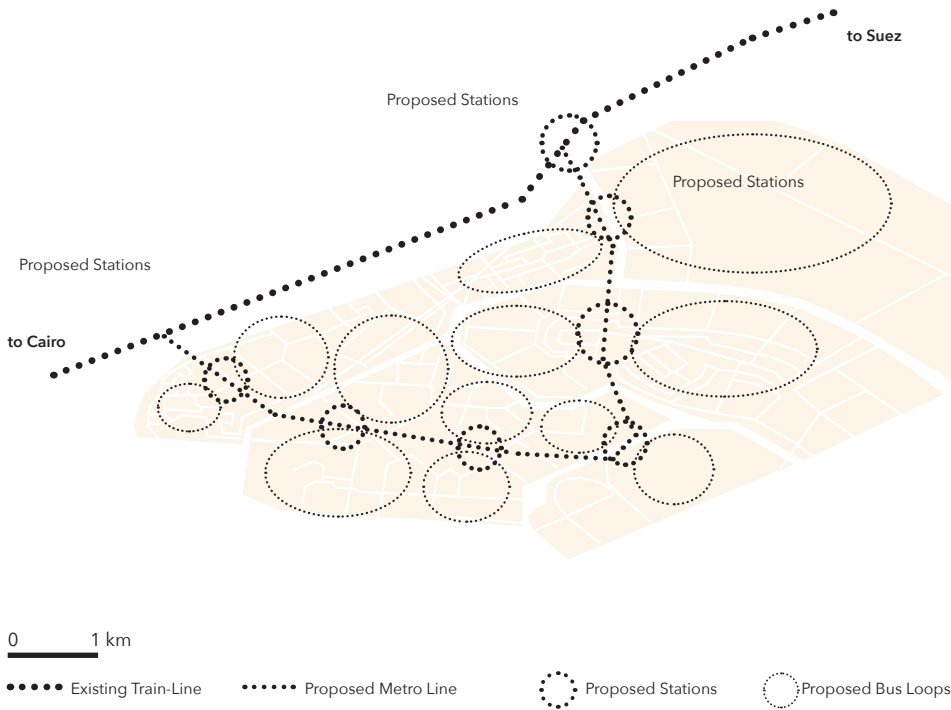
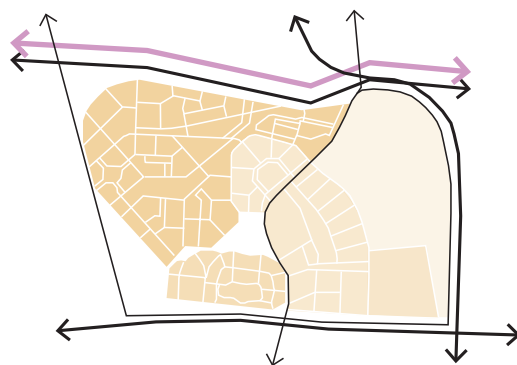


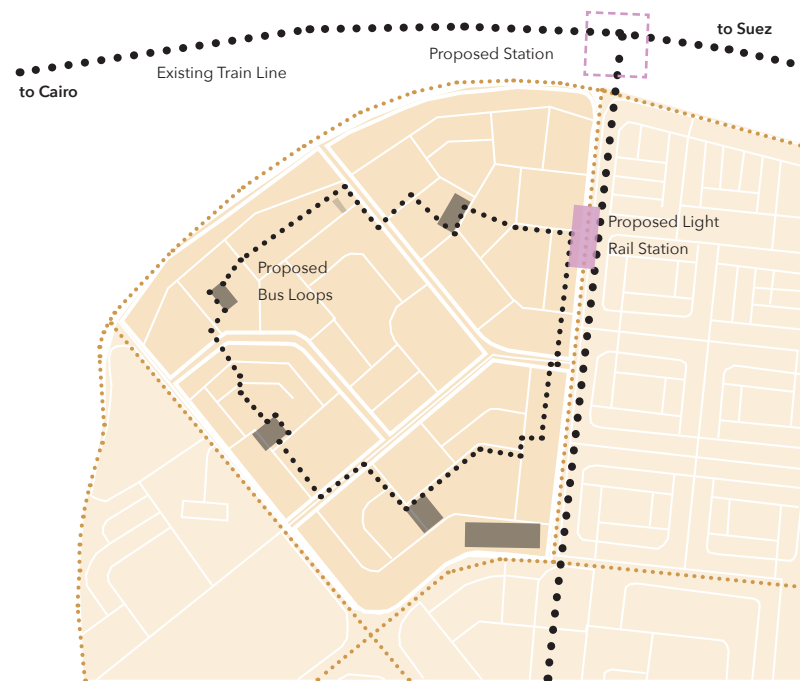
Figure 7 Proposition for a transportation model for Badr City, Drawing by Author

By introducing a light-rail station, there is a chance for the station to become a hub that attracts and distributes economic activities. The focus is not only on the station itself but its territory, relationship with the urban fabric, and location and function within the surrounding district. Under the linear system approach, the station district would act as the element that serves the greater whole. That would assist in building functions that provide rich environments for the neighbouring areas, redefining the linkage between those regions and creating a corridor of integrated urban areas that boosts the local economy, providing job opportunities.



0 1 km

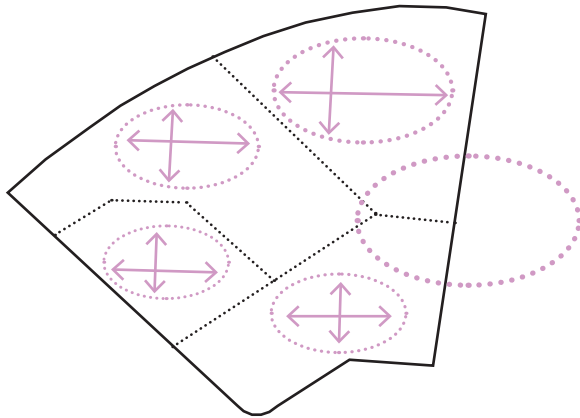
Figure 8 Location of Zomoroda Housing Estate in Badr City. Drawing by Author



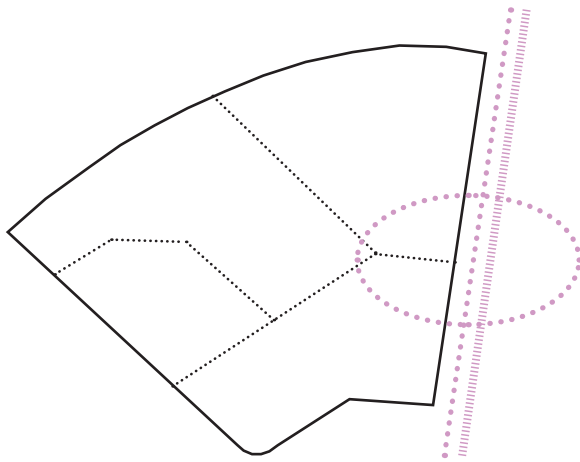
0 1 km

Figure 9 Models of Mobilizing "Informality" in Zomoroda Housing Estate. Drawing by Author

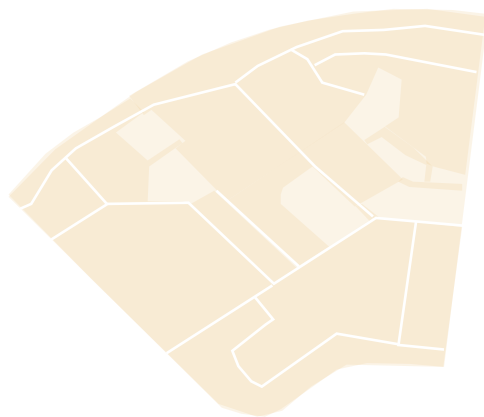
State funds may be used in the station application to create opportunities for initial transformation. This scenario would achieve long-term multi-scale developments. Creating a series of mixed-use towers for the State to host lucrative programmes on the top of the station will help fund the station's investment and maintain the station's district.



Other Models of Mobility for a wider Integration Effect:
Minibuses & Tuktuk



Light-rail Station District



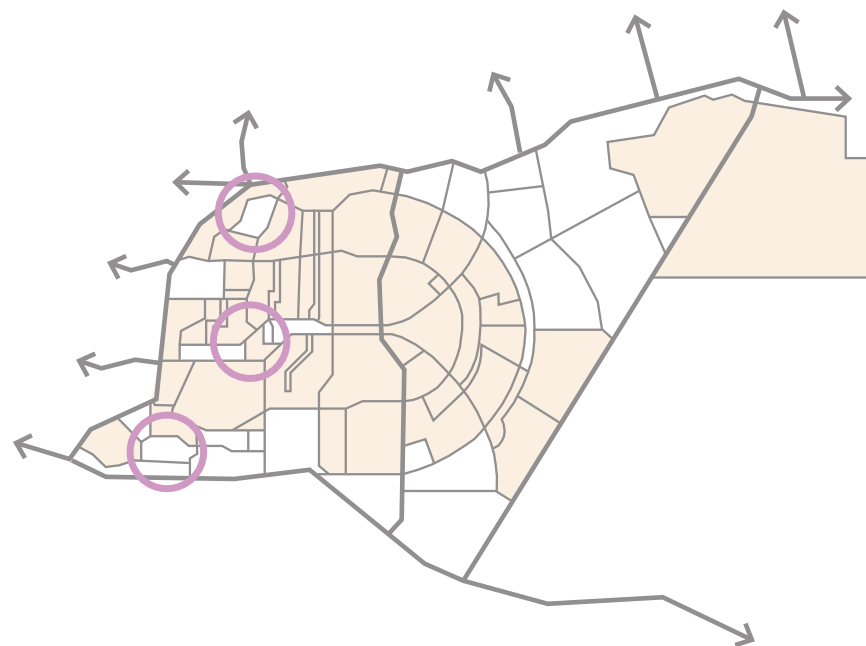
Zomoroda Housing Estate

Figure 10 Different Models of Mobility. Drawing by Author

2.II MOBILIZING NEW CAIRO CITY

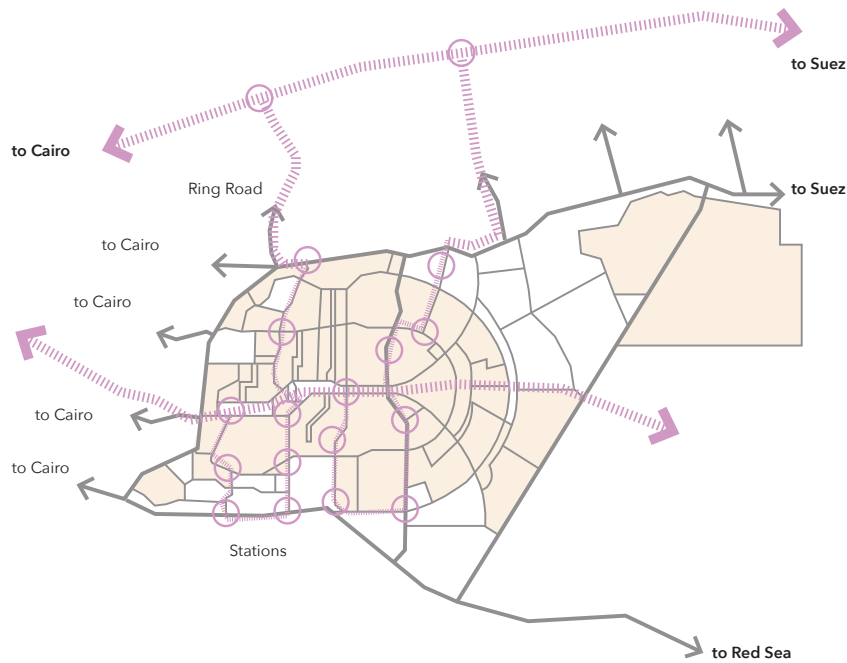
Although New Cairo has a relatively successful rate compared to the rest of the desert cities, it has a low ratio of social housing units. Most social housing units are situated in the south and shifted towards the city's periphery. As most social housing estates residents are not car owners, a plan to bring an effective transportation system to the social housing estates and the city is fundamental for a redevelopment plan.

Aiming at linking the social housing estates to New Cairo, transport systems must start bridging the gap between the existing rail lines and the new monorail lines with the rest of the city. Based on the propositional plan of linking the desert cities with Cairo and similarly to the mobility plan in Badr City, New Cairo's transportation methodology could replicate in that manner. Linear mobility systems could start from the monorail lines and link the city. Also, stations could begin to capitalise on the notion of urban acupuncture by trying to bring new programmes to the urban realm.



0 10 km

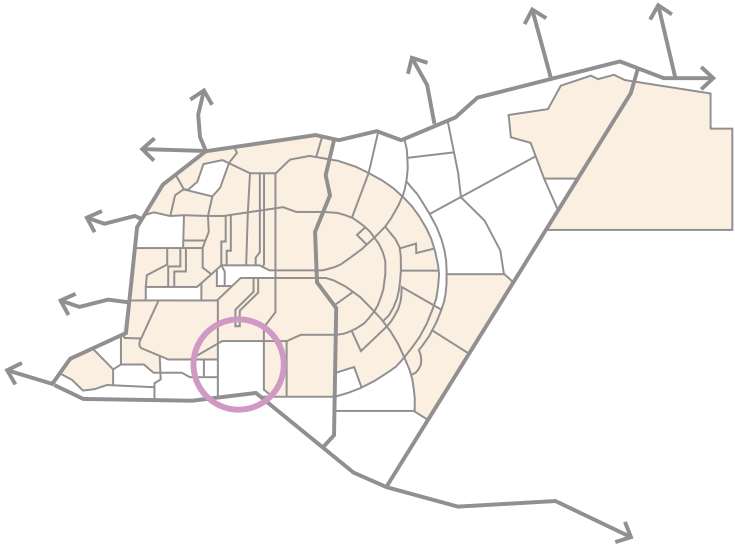
Figure 11 Social Housing Estates in New Cairo. Drawing by Author



0 5 km

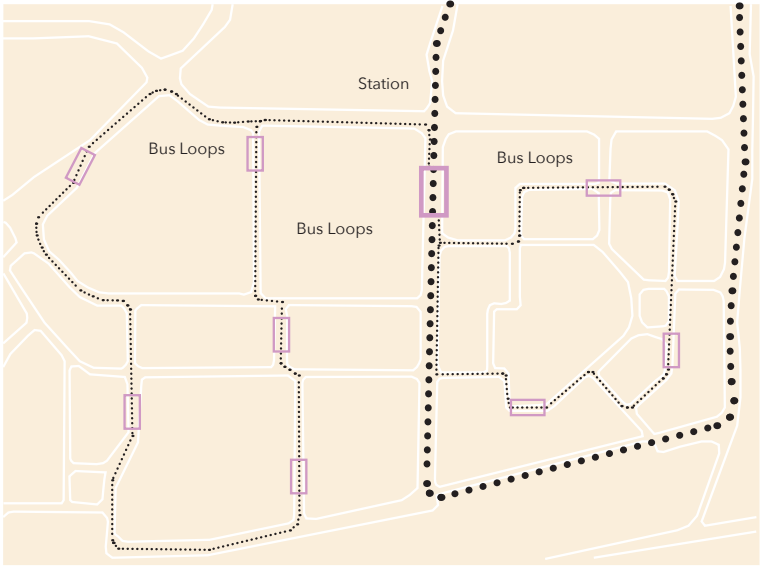
Figure 12 Propositional Transportation System in New Cairo. Drawing by Author

Given the importance of work-home proximity in "informal" Cairo's streets, having a light-rail station on the street level will create job opportunities and other substantial programmes for the neighbourhood. One possible scenario that could take place in the station's territory is the Souk (street market). The station and the Souk may attract a range of people-related interactions in commerce and business in an open space. That will generate diverse spaces for communal activities, allowing integration between new residents to happen. In addition, the station's territory will go beyond the rail line and include a wider urban area where urban intensification is spatially supported. Therefore, social and spatial integration processes occur across a diverse scale.



0 10 km

Figure 13 New Cairo City. Drawing by Author



0 500 m

Figure 14 Stations as Trojan Horses in New Cairo's Third District. Drawing by Author

Different transportation models could start to evolve from the station district to create urban-wide connectivity and integration opportunities. The proposed bus loops are one scenario, yet the "informal" sector could bring more transport routes to achieve better integration. Different transport models could trigger a reconfiguration and intensification process. Bus stations, for example, can attract programmes and commercial activities, creating densification.

3. THE MICROSCALE, THE STATION AS A TROJAN HORSE SUSTAINABLE ENERGY PRODUCTION

The station could act as a Trojan Horse to the deserted neighbourhoods as an architectural typology that brings many of the missing programmes to the site. Also, it assures that the neighbourhood could survive the current mono-functionality of the context. The station and the mixed-uses would not only create a spectrum of activities and programmes. They will also help develop a system of initiatives that starts to take place around the realm of the station. Thus, the station is a catalyst of change not only to the neighbourhood but also to the Deserted City. Introducing a mixed-use station building on top of the railways will give a chance to bring many programmes and activities to the station. That density will not only create many job opportunities and introduce new services to the site, but it will also act as an energy producer to the surrounding area due to its big scale.

In recent years, the role of architectural buildings has expanded dramatically, thanks to technology and innovation. As a result, it is common nowadays to find zero-energy buildings. Also, some buildings could now produce more energy than they need. Could the new stations play a role in this notion and produce energy for their surrounding neighbourhood?

Due to the possible big scale of the station and the buildings on top, the façades of the buildings could accommodate a large number of solar panels. Furthermore, since Egypt is recently manufacturing its solar panels, the production and costs of the solar panels would be optimised and relatively more affordable. Also, wind turbines could be implemented on the rooftops of the buildings above the station and by the railways. Furthermore, as wind speed is relatively high in many areas across Egypt, this sustainable energy production could create electricity in many deserted cities.

STREET MARKETS AND COMMUNAL SPACES

Communal spaces are a critical quality that could help the station become a hub for collective activities, bringing life to the deserted cities. As most desert cities lack services and social activities, the station could become a catalyst for bringing these missing qualities to these neighbourhoods and help the new residents integrate and interact with their new city and neighbours.

"Informal" markets (Souq) and street vendors are standard features in Egyptian streets. As the country passed through hard financial times, many people started to work in the "informal" sector, where street markets were one of the main sectors that absorbed

significant employment. That also helped fill a service delivery gap for many Egyptians, where it served many with necessary products at affordable prices and activated many streets and urban spaces.

"in 2013, informal employment forms 51 per cent of the country's non-agricultural employment, employs 8.2 million people, and includes 7.6 million men and 572,000 women (2009 data). Informal employment is estimated by the ILO to contribute 16.7 per cent of Egypt's GDP (2008 figures)".⁴ The number of "informal" employees is increasing. "by the inability of the formal sector to create enough jobs for the massive influx of young new entrants onto the labor market".⁵ In 2013, the unemployment rate in Egypt for young adults between 18 and 29 was 23.7%.⁶

MICRO-BUSSES AS TRIGGERS FOR STREET MARKETS, CASE STUDY



Figure 15 Bottom-up market of Al-Attaba in Cairo next to micro-busses station. Source: For Egyptians, 'two children are enough' amid overpopulation fears: Amr Emam. AW. (n.d.). Retrieved March 29, 2022, from <https://thearabweekly.com/egyptians-two-children-are-enough-amid-overpopulation-fears>

Private micro-busses play a fundamental role in Cairo's transportation system due to the lack of a proper public mobility system. As micro-busses increased, they started to have several stations around Cairo. Therefore, some bottom-up markets started to take place. That delivered services to people waiting for their transportation mobile. That typology has become common across Cairo with many micro-scale bottom-up markets.

The propositional stations in the deserted cities have a chance of replicating such a typology with targeted service deliveries. The stations will become a centre of densification and intensification, triggering bottom-up markets. For the deserted cities not to become completely "informal" (as in some parts of Cairo), the stations have to offer a regulated place for those bottom-up markets to happen. In this way, it will become the catalyst of services to the deserted cities and act as a regulation between the top-down forces and the bottom-up initiatives.

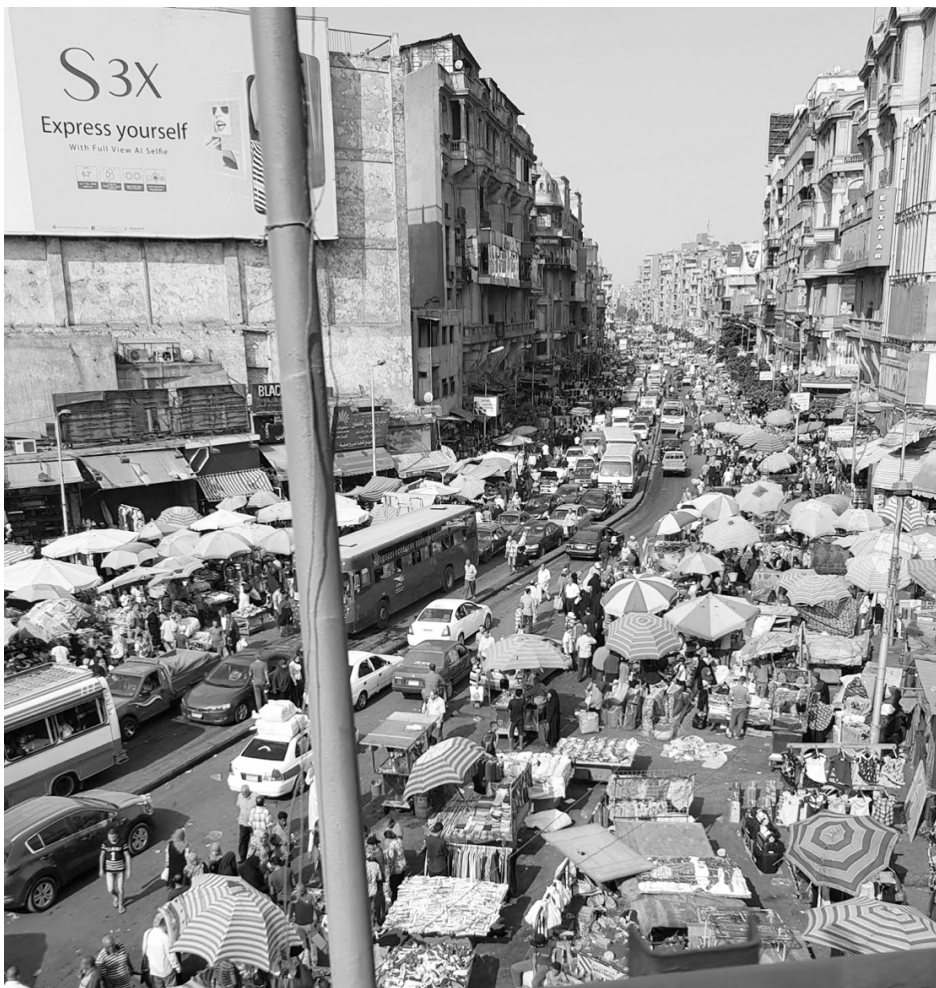
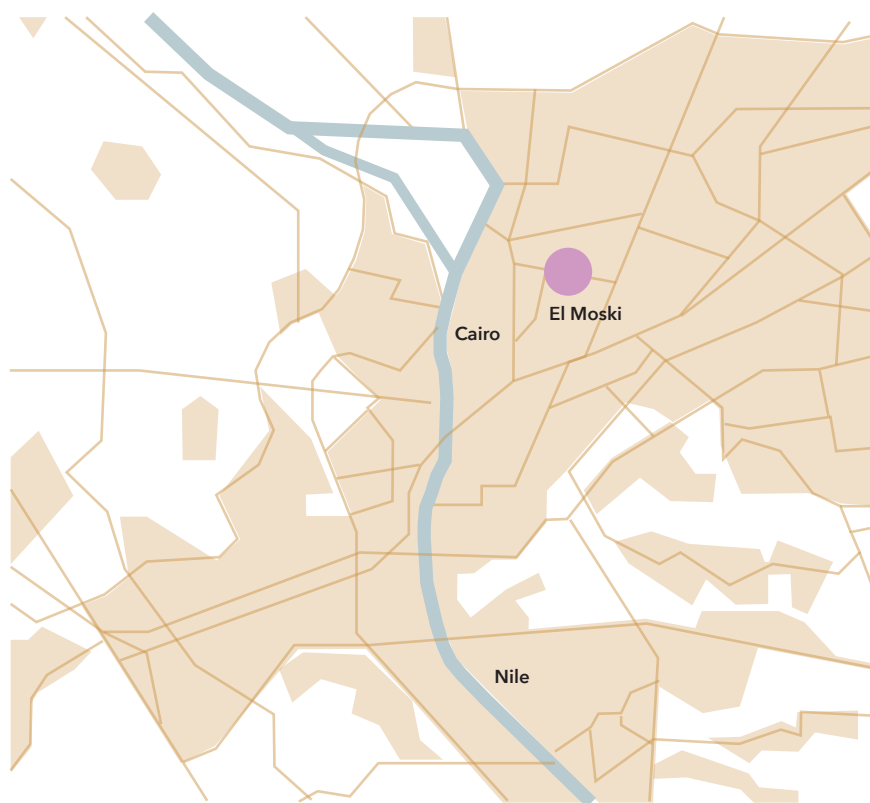


Figure 16 Bottom-up market of Al-Attaba in Cairo next to micro-busses station Source: The streets of Cairo. (n.d.). Retrieved March 29, 2022, from <http://laurainsingapore.blogspot.com/2018/10/the-streets-of-cairo.html>

EL MOSKI, MARKET AND COMMUNAL SPACE CASE STUDY



0 30 km

Figure 17 El Moski Location. Drawing by Author

The Ataba and Al-Muski market function as commercial centres in Cairo.⁷ Street vendors seek to capitalise on the central location and reputation of the districts. In addition, street vendors try to grab some of the wealth produced by the transnational trade districts and simultaneously reach some customers from the customer flows attracted by the trade centres. For this reason, street vendors have developed strategies to set up shops in the centre or on the outskirts of two commercial centres to attract the attention of the large clientele al-Muski. However, municipal authorities and more official traders see their massive presence in public spaces as a sign of urban disorder, the spread of which should be regulated or even stopped.

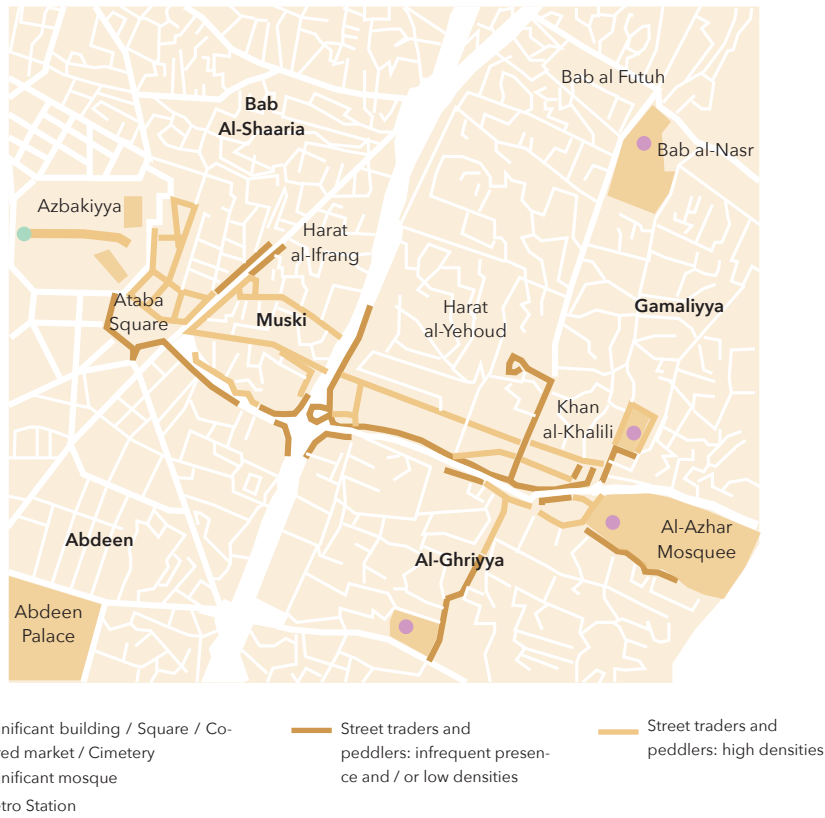


Figure 18 Al-Muski Market in Cairo's Urban Fabric. Source: Anne Bouhali, "Negotiating Streets and Space in Transnational Trade Marketplaces in Oran (Algeria) and Cairo (Egypt): "Place Struggle" in the Commercial City", *Articulo - Journal of Urban Research* [Online], 17-18 | 2018, Drawing by Author



Figure 19 Al-Muski Market. Source: Informal Street Markets in Egypt - habitat unit. (n.d.). Retrieved March 5, 2022, from <http://habitat-unit.de/en/research/informal-street-markets-in-egypt/>

The typology of the Al-Muski market is linear as it connects the Azbakuyya metro station with the Al-Azhar mosque. Although the market is linear, it has some secondary perpendicular streets that connect to Al-Azhar street. The success of this market in collecting a large number of customers relies on many factors:

First: it is in the city centre and connects two important landmarks (Al-Azhar mosque and Ataba Square).

Second: it is close to the Azbakiyya metro station, which most customers use to access the market.

Third: it is a bottom-up market, where street vendors serve a wide variety of cheap products and services to people.

Fourth: it is parallel to Al-Azhar main street (a formal service delivery street), so it successfully attracts some of its customers.

The "struggle of places" can be seen in street vendors and their interactions with Egyptian governments and shops.⁸ Despite their lack of traditional sources of authority, they negotiate their place in the commercial city and "use location-specific tactics to circumvent restrictions and maintain their business" inside the traditional market.⁹ Al-Muski street vendors demonstrate the "quiet encroachment of the ordinary people"¹⁰, that is, "non-collective but prolonged direct actions of dispersed individuals or families to acquire the necessities of their lives (land for shelter, urban collective consumption or urban services, informal work, business opportunities, and public space) in a quiet and unassuming illegal fashion."¹¹ *"It describes the silent, protracted, but pervasive advancement of the ordinary people on the propertied, powerful, of the public, to survive and improve their lives"*¹². In the case of al-Muski, street sellers expand on public space and economic possibilities generated by shopkeepers, raising their rage, sometimes in alliance with the State, sometimes in partnership with the State, and sometimes in more or less passive agreement.

THE IMPORTANCE OF MARKETS LIKE AL-MUSKI TO CAIRO

Markets like al-Muski offer a spectrum of variety to the pedestrians of Cairo. That creates an urban service delivery quality that Egyptians need for their daily life to access essential products. These markets are always busy as they capitalise on the street fabric hierarchies and create a pedestrian-friendly shopping experience.

These service deliveries were one of the reasons that attracted Egyptians to Cairo. Also, many desert cities around Cairo remained empty due to the lack of such markets and pedestrian-friendly zones. These bottom-up activities offer many qualities to the urban environment and target residential needs. Planning new towns without integrating some bottom-up or "informal" initiatives backfires as it keeps these new urban environments deserted and not attractive to Egyptians.

HOW COULD THE NEW STATIONS HELP BOOST THIS TYPOLOGY

Through learning from the al-Muski case study, accessibility plays a fundamental role in attracting people to the market area. The market succeeded because it has a starting and an ending point, which act as magnets to attract people to the market. The metro

station was the starting point, and the Azhar mosque was the ending point, where the market connected them. For any public service to succeed in desert cities, accessibility becomes the main factor. The propositional stations in the desert cities could capitalise on the same logic, where the stations become the starting and ending point of the street market. That could bring many services to deserted cities and generate many job opportunities. Moreover, communal spaces could start to take place around the station as the station becomes the catalyst of change, bringing intensification and exchange qualities to the urban environment

SOUTH BANK LONDON, COMMUNAL SPACE CASE STUDY

Learning from the South Bank case study, the new stations in the desert cities could replicate the idea of communal spaces across its realm, not only horizontally but also vertically. Therefore, there is a high possibility for the station to attract many visitors and create different qualities for people to interact, integrate and enjoy some social activities that the deserted cities lack in many cases. If the station succeeds in doing so, it will act as a hub in the ghost cities and bring the urban qualities that the city needs.

The South Bank district in London is in the south of London was an undeveloped area. So the State decided to invest in the South Bank area and develop some "social buildings" (like The Royal Festival Hall, South Bank Centre, The Royal National Theatre and Tate Modern Museum) that attract many people and create a sequence of communal spaces to connect the residents with the southern part of London.¹³

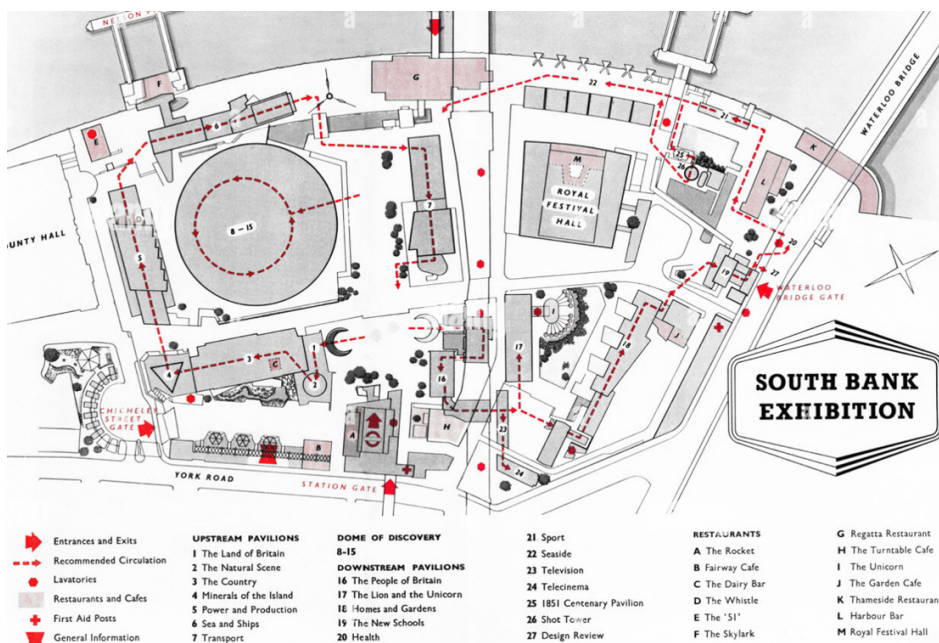


Figure 20 South Bank Area in London. Source: Limited, A. (n.d.). Karte von South Bank ausstellung von the festival of Britain guide, herausgegeben von gebr. London, UK, 1951 Stockfotografie. Alamy. from <https://www.alamy.de/stockfoto-karte-von-south-bank-ausstellung-von-the-festival-of-britain-guide-herausgegeben-von-gebr-london-uk-1951-36845426.html>

By analysing the section drawing of the Royal Festival Hall, one can clearly understand the importance of the permeability of the ground floor and the sequence of vertical and horizontal spaces. As communal spaces are distributed all over the building, visitors are attracted to activities on the ground and upper floors. As illustrated in the section below, the building offers an auditorium, bars, cafes, a restaurant, an open terrace, art galleries, shops, musical rooms, performance areas and several seating areas.

The idea of gentrification and attracting public activities to the Southern side of London has succeeded. The Thames river no longer divides the city in terms of urban qualities. Instead, the buildings acted together as hubs for densification, intensifying and creating opportunities for the development of public activities. As a result, South Bank became one of the most famous public promenades in London for tourists and Londoners.

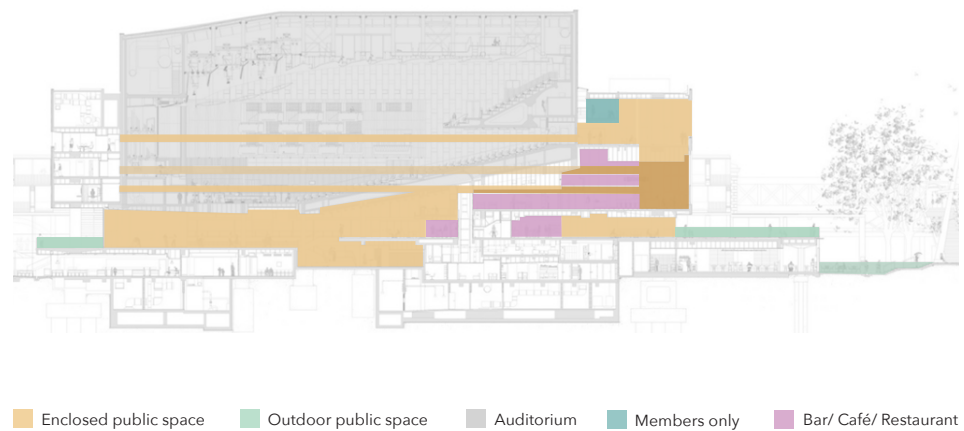


Figure 21 Royal Festival Hall - space usage. Source: <http://openbuildings.com/buildings/royal-festival-hall-south-bank-centre-profile-3515/media#!buildings-media/10>



Figure 22 Royal Festival Hall. Source: Admin, Admin, 3, G. F. M., 4, admin P. authorM., 3, A. G. M., 5, admin P. authorM., 4, A. M., 5, A. M., & 22, D. H. N. (2015, May 3). The Royal Festival Hall - Dramatic Effects of space and Vista. A London Inheritance. From <https://alondoninheritance.com/london-buildings/the-royal-festival-hall-dramatic-effects-of-space-and-vista/>

THE VISUAL AND SPATIAL IMPACT OF THE STATIONS

Another critical quality the station could bring to the deserted cities is a new visual dominance. That dominance is essential to show that the deserted cities have new stations and a mobility system; it is a tool that illustrates the new typology of the station. The stations can change how desert cities function, bring civilian qualities and change the precarious condition of Egypt's desert cities. To delve into the topic of visual relationships in architecture and urbanism, Parc De La Vilette is an example of how visual connection could strongly influence how the city functions.

PARC DE LA VILETTE BY BERNARD TSCHUMI, CASE STUDY

"La Villette, then, aims at an architecture that means nothing, and architecture of the signifier rather than the signified- one that is a pure trace or play of language".¹⁴ When Bernard Tschumi won the position of the lead architect at Villette, he was an architectural thinker, a writer and a teacher. However, he had not yet completed any significant public projects. Instead, he formed his ideas through writing and the presentation of sketches. Villette is one of the finest themes that run through his writing, colliding with the physical environment. However, what were these themes, exactly? It is first crucial to deconstruct Tschumi's design before answering this question.¹⁵

Tschumi describes the park as an encounter of three autonomous systems. He was possibly referring to the other 'great' French postmodern philosopher Jean Baudrillard (author of 'A System of Objects'), the system of objects, the system of movements and the system of space.¹⁶ The organisational framework of the park expresses these systems: points, lines and surfaces, all laid over an orthogonal grid. These components are referred to as the programmatic systems by Tschumi.¹⁷

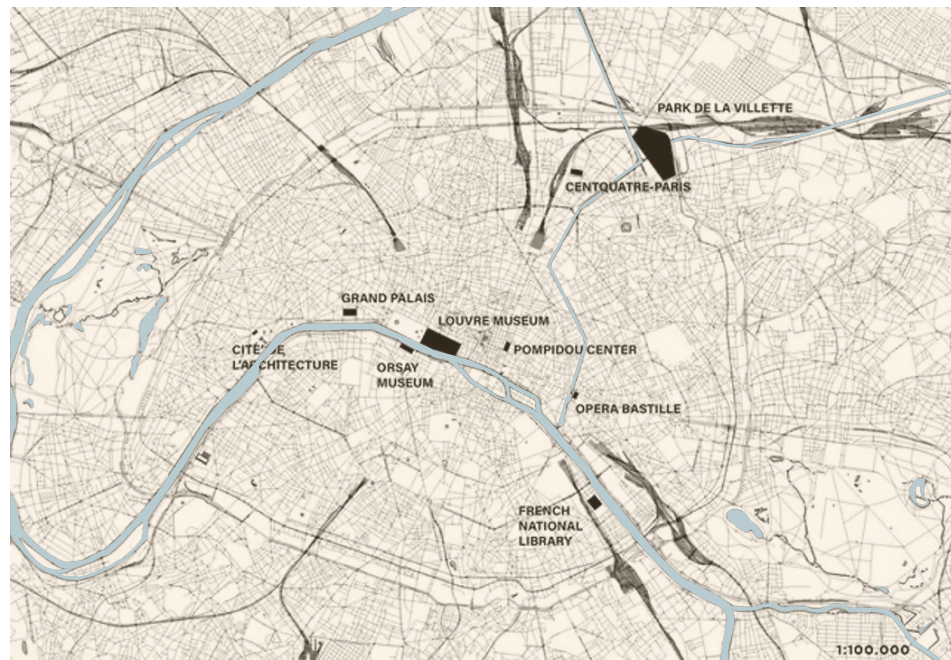
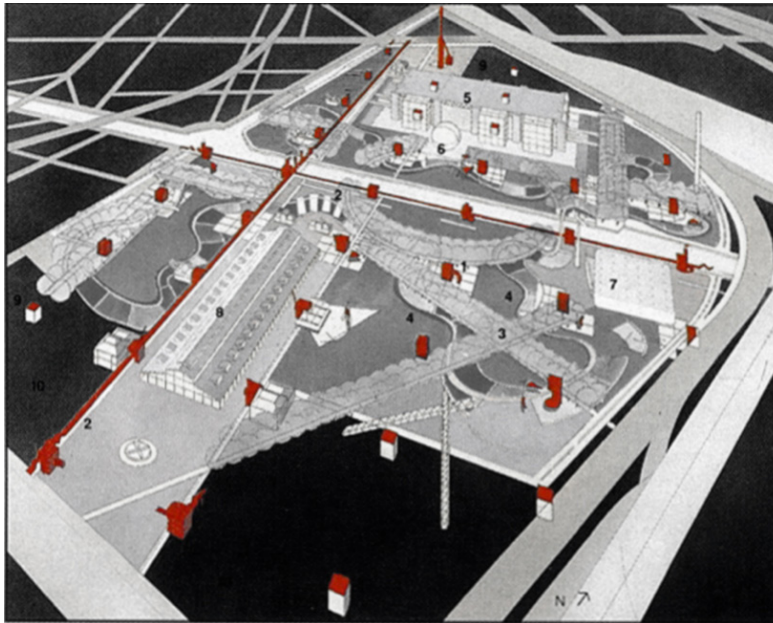


Figure 23 Location of Parc De La Villette. Source: D'Autilia, R., & Hetman, J. (2018). Complex buildings and cellular automata—a cellular automaton model for the CENTQUATRE-paris. *Urban Science*, 2(2), 50. <https://doi.org/10.3390/urbansci2020050>



Bird's Eye View Of Parc De La Villette

- | | | |
|--------------------|----------------------------------|--------------------------|
| 1 Follies | 5 Museum of Science and Industry | 8 Grande Halle |
| 2 Covered Walkways | 6 Geode Theater | 9 Housing Sites |
| 3 Allees | 7 Zenith Concert Hall | 10 "City of Music" Sites |
| 4 Cinematic Path | | |

Figure 24 Parc de la Villette. Source: Bernard Tschumi

POINTS

The system of points corresponding to the system of objects is the first programmatic system. The points system demarcates the underlying organisational grid at 120 m intervals through a network of bright red foils. Each folie is produced from a cube of 10x10x10m, deconstructed and reformed. The original purpose of Tschumi was to disperse the programme requested to the site through these points. The points act as "points of strength" to allow complete movement through the site, shown in the diagram below.^{18,19}

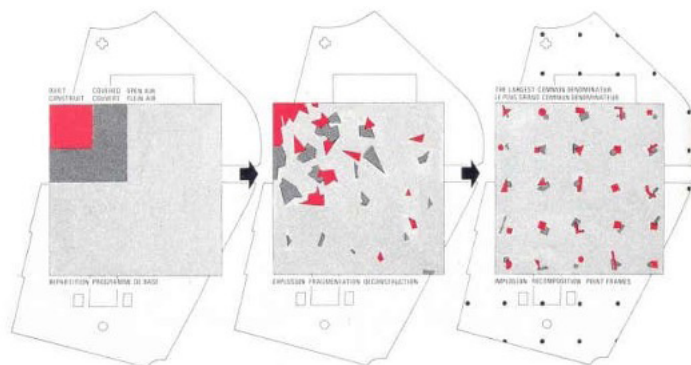


Figure 25 Parc De LA Villette, Programmatic Deconstruction. Source: Bernard Tschumi

The Folies intended to serve as a symbol to the site "As powerful as the British public telephone booth or the gates of the Paris Metro".²⁰ They are distinctive, echoing the "kinetic sculptures" and compositions of the Russian avant-garde of the early twentieth century.²¹ Tom Turner identifies them as cheerful and red structures that resemble cranes.²²

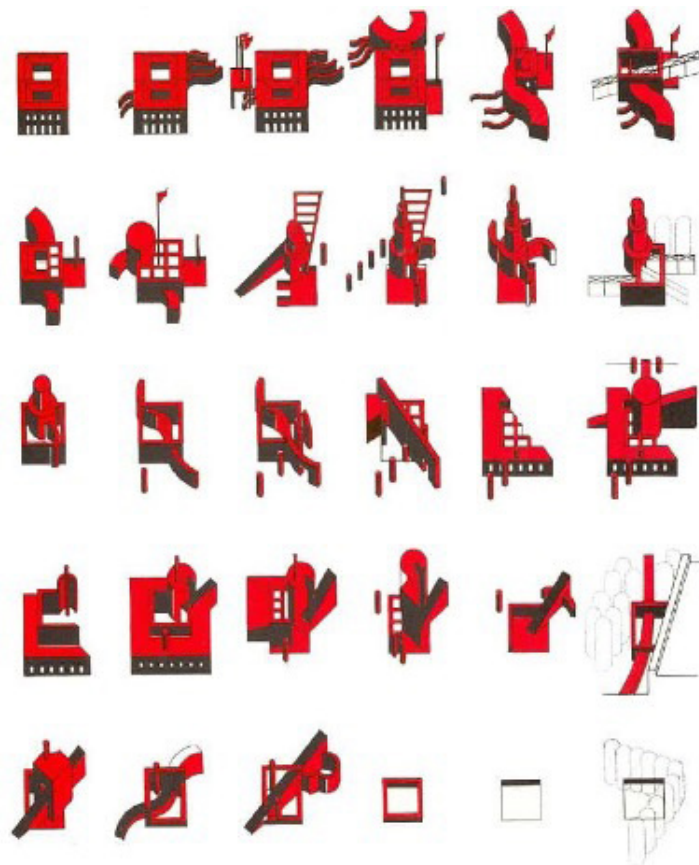


Figure 26 Parc De LA Villette, The Folies. Source: Bernard Tshumi

LEARNING FROM PARC DE LA VILLETTE

There are several benefits that the stations could bring to the deserted cities and help in the process of inhabitation. Nevertheless, one can learn from the Folies in Parc De La Villette that the structure's morphology, presence and dominance can help change the individual's perspective towards architecture and urbanism. In that case, the programme, morphology, scale and presence of a series of connected stations could change the negative image in the majority of people and help the stations bring a new positive character to the deserted cities.

Although the new electrical train will only pass through the borders of many deserted cities, there is still an opportunity for new mobility lines to take place inside the desert cities. Also, it is critical to capitalise on the idea of the station as a hub of activities, try to present the new stations as a new icon in the desert cities and aim at changing the deserted cities' image.

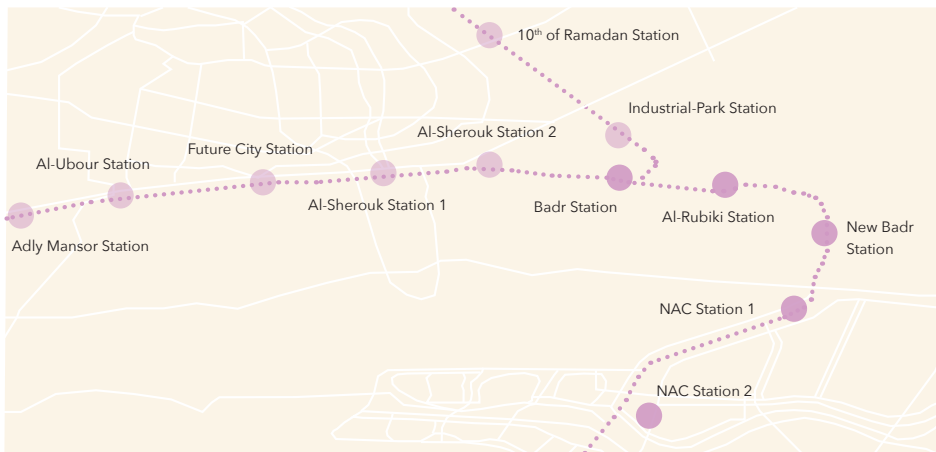


Figure 27 The Route of the Monorail that will connect the New Administrative Capital with the desert cities. Source: The Spokesmen of the Egyptian Presidency. Drawing by Author

The station's structure has to act as one structure, not as the sum of parts. The stations should serve as a connected network that brings new diverse urban activities and social services to the deserted cities. That could start with a few yet efficient stations that bring urban qualities to the neighbourhoods and trigger "informality". Later, more stations could replicate that notion to help the desert cities to reach a level of transportation efficiency and qualitative service delivery.

4. BOTTOM-UP JOB OPPORTUNITIES AND SOCIAL COMMITMENT GARBAGE CITY, CASE STUDY

As a former slum, the garbage city has a different order and a well-organised network of narrow streets branching off the main access road. These streets are used to sort garbage and transport it to external companies by residents, truck drivers, and carts on wheels pulled by donkeys. As a result, the garbage city is constantly moving, and each family specialises in sorting a specific type of garbage.²³



0 30 km

Figure 28 Garbage City Location. Drawing by Author



Figure 29 Garbage City. Source: KimmConn. (2021, December 10). Cairo Garbage City: A suburb that gives a new meaning to trash. Adventures & Sunsets. Retrieved March 7, 2022, from <https://www.adventuresnsunsets.com/cairo-garbage-city/>

Since the government developed a new mechanisation system for the transportation of solid garbage in the 1990s, the Zabbaleen have been obliged to raise capital to acquire garbage transport vehicles. The purchase of vehicles and specialised waste processing machinery was made feasible by their savings, selling their small pieces of land or obtaining loans.

Rubbish collectors feed pigs and are the first link in the sorting system since they consume organic leftovers. Local women are in charge of trash processing and pig feeding.²⁴ Owners of vehicles and machinery employ people in their workshops to sort cardboard, metal, and plastic and export many items to China.²⁵



Figure 30 Garbage City. Source: Schaffer, C. (2020, May 15). Garbage City, Cairo, Egypt. Christian A. Schaffer. Retrieved March 7, 2022, from <https://christianschaffer.art/journal/garbage-city-cairo>



Figure 31 Garbage collection. Source: KimmConn. (2021, December 10). Cairo Garbage City: A suburb that gives a new meaning to trash. Adventures & Sunsets. Retrieved March 7, 2022, from <https://www.adventuresunsets.com/cairo-garbage-city/>



Figure 32 Sorted garbage stored on rooftops. Source: KimmConn. (2021, December 10). Cairo Garbage City: A suburb that gives a new meaning to trash. Adventures & Sunsets. Retrieved March 7, 2022, from <https://www.adventuresnsunsets.com/cairo-garbage-city/>

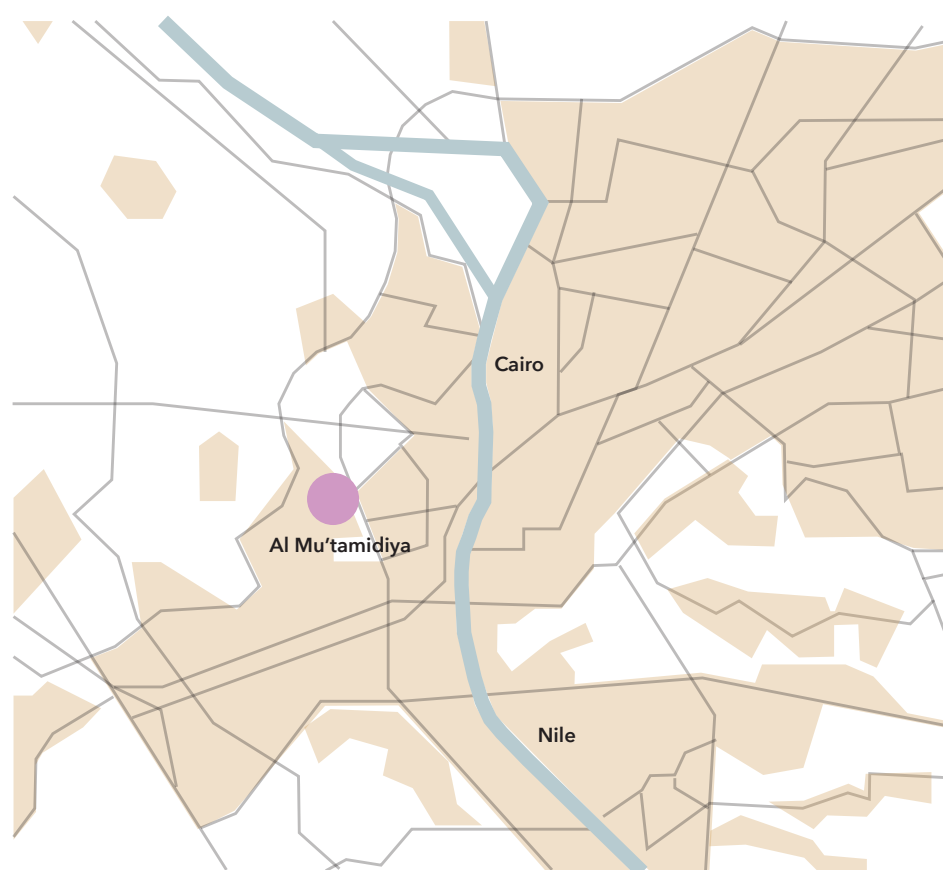
Although the municipal services and the Zabbaleen community have long shared responsibility for the urban waste system, the EPC (Environmental Protection Company) creation has made the Wahiya and the Zabbaleen essential players in the local government's plan to reshape Cairo's waste management system. It is administered by the Wahiya, who advertises the company's services to the market, collects household costs, and oversees service delivery. However, the Zabbaleen have an "informal" system of doing that when it comes to garbage sorting and recycling.²⁶

The presence of bottom-up activities in Egypt seems to be an essential factor in the Egyptian social, financial and physical system. The presented case studies represent the potential of bottom-up and "informal" activities in solving many problems in the Egyptian system.

By mobilising “informality” to the desert cities, there is a high potential to overcome many epidemic problems. The propositional transportation lines and stations trigger “informality” to start a sustainable urbanisation process.

AL MU'TAMIDIYA, CASE STUDY

The community of al Mu'tamidiya undertook a notable project of self-built infrastructure inside the shifting grey region between formal and “informal”. Isolated by the Ring Road's construction, the Al-Mu'tamidiya neighbourhood began a self-build effort to link with the Capital. Locals constructed on-and-off ramps to the Ring Road during the 2011 post-revolutionary chaos. The ramps are one kilometre south of the 26th of July Corridor and two kilometres north of the Saft al-Laban Corridor. According to one of the community leaders, the project cost roughly a million Egyptian pounds, or about a fourth of what it would have cost if built by the government.²⁷



0 30 km

Figure 33 Al Mu'tamidiya Location. Drawing by Author

The programme was carried out independently by the community, with some contributing financially, some donating knowledge or equipment, and others volunteering their physical labour. As a result, the ramps were built to a comparable standard and look. Furthermore, the initiative documented the building process and captured it in a powerful film, which was then forwarded to Giza's governor and police commander, inviting them to launch the project. As a result, the Giza Governorate formally integrated the new ramp system into the municipal infrastructure, honoured the revolutionary citizens' proposal and established a traffic police station beneath the highway.²⁸

In this example, people used infrastructural intervention to remedy their basic needs and thereby raised a fundamental question about the meaning of citizenship and equality. *"The significance of al-Mu'tamidiya is far more symbolic than the utilitarian role and cooperative economic model it offers - it stands as a testimony of an emerging urban order."*²⁹



Figure 34 Al Mu'tamidiya ramp. Source: Stryker, Beth, Omar Nagati, and Magda Mostafa. Learning from Cairo: Global Perspectives and Future Visions. Cairo: Cluster, 2013. Print.

The community claimed its civic right to the city and its public places by seeking to acquire access to its infrastructure, which they have been denied for decades. In this case, "informality" renegotiates the formal and "informal" connection for future urban development trajectories.



Figure 35 Al Mu'tamidiya ramp, in 2009. Source: googlemaps



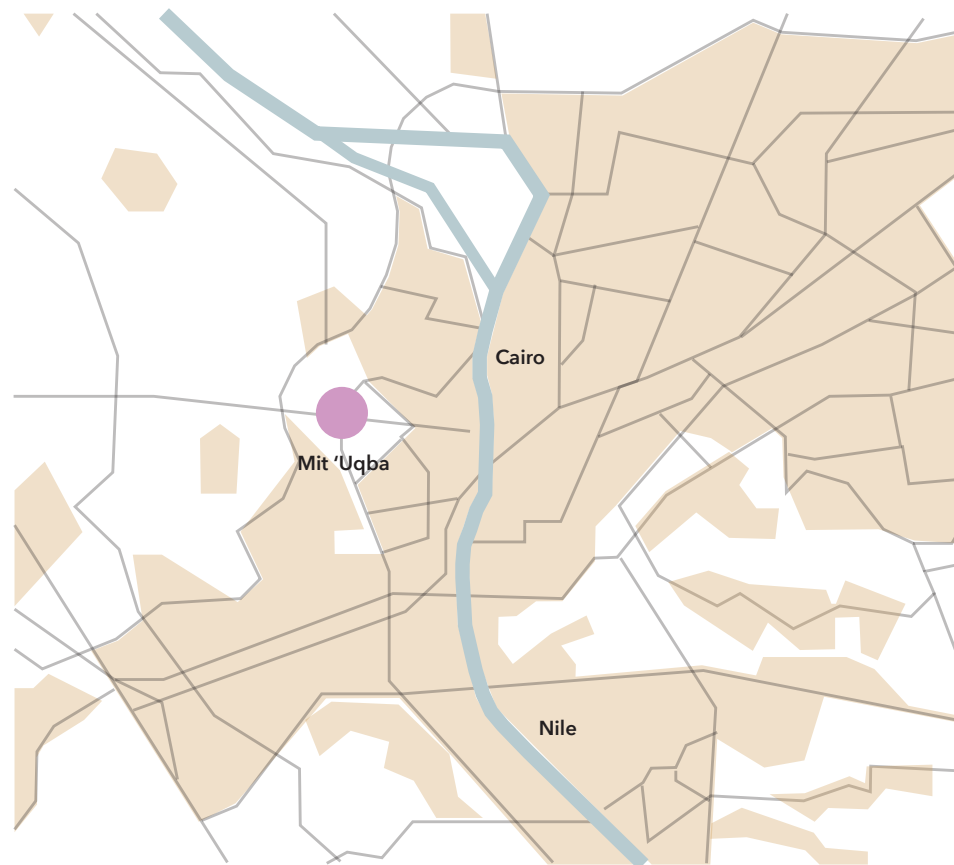
Figure 36 Al Mu'tamidiya ramp, in 2012. Source: googlemaps



Figure 37 Al Mu'tamidiya ramp, in 2022. Source: googlemaps

MIT 'UQBA, CASE STUDY

During the Revolution, the people of Mit' Uqba could optimise and maximise the use of scarce public resources, paving more roadways than the Local District had anticipated.³⁰



0 30 km

Figure 38 Mit 'Uqba Location. Drawing by Author

During the last few years, this group devised a method of ensuring their right to data by taking proper steps to obtain funding from the Local District for the paving project. Their commitment to social responsibility ensured that the assets were spent wisely on the project. *“Such insights can shift prevailing state policies towards more transparent, equitable and deliberative urban practices that build upon the physical, social, and economic assets of our local communities. Urban activists can play a key role in promoting a counter-narrative and new urban agenda that challenges the assumptions of the reigning urban paradigm.”*³¹

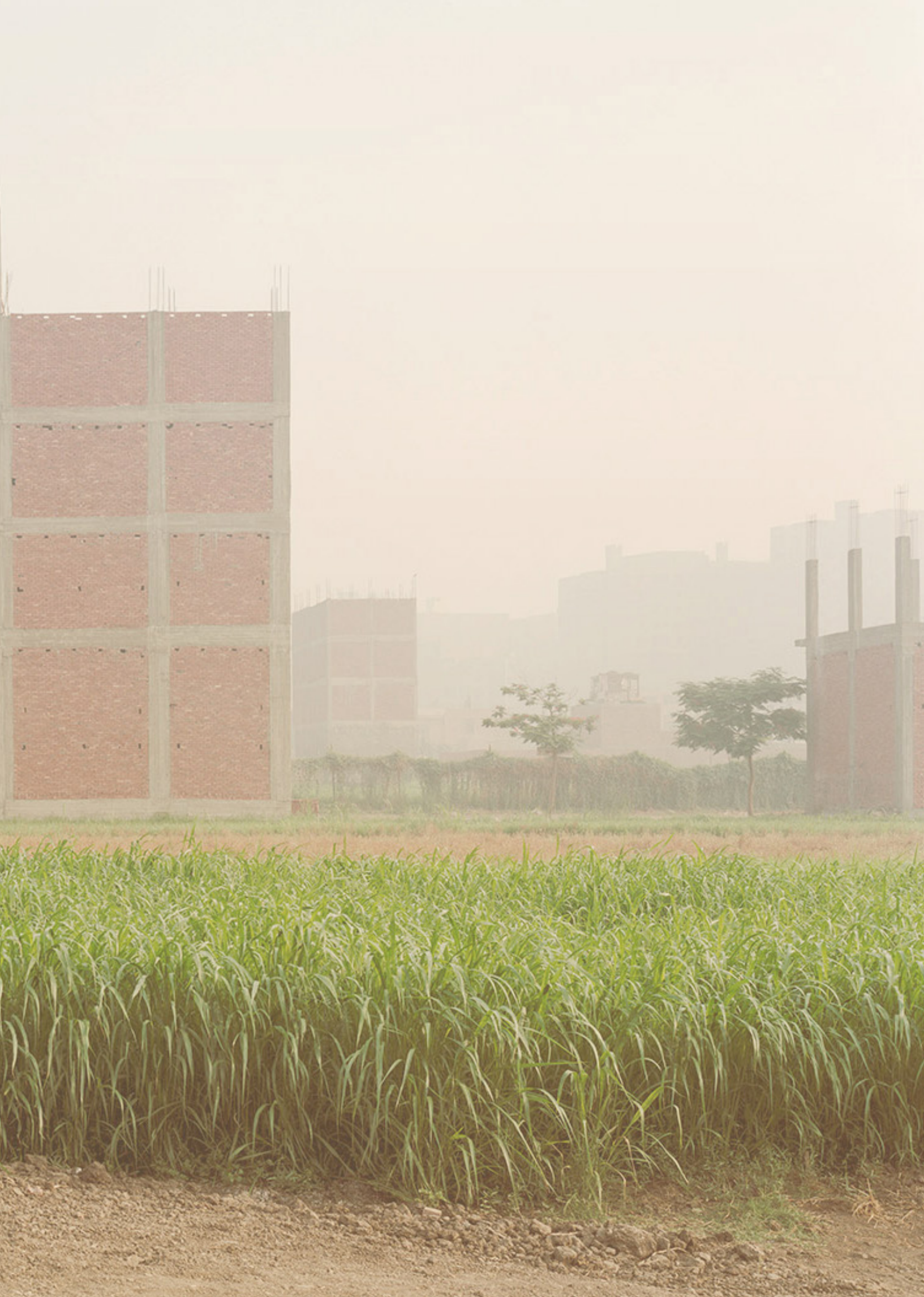


Figure 39 Neighbors paving their streets. Source: Stryker, Beth, Omar Nagati, and Magda Mostafa. Learning from Cairo: Global Perspectives and Future Visions. Cairo: Cluster, 2013. Print.

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- 16 (Barzilay Et Al, 1986)
- 17 Donovan, Joey. "Deconstructing Villette." Academia.edu - Share Research, www.academia.edu/8951226/Deconstructing_Villette.
- 18 (Tschumi, 1987)
- 19 Donovan, Joey. "Deconstructing Villette." Academia.edu - Share Research, www.academia.edu/8951226/Deconstructing_Villette.
- 20 (Damiani, 200)
- 21 (Damiani, 200)

- 22** Donovan, Joey. "Deconstructing Villette." Academia.edu - Share Research, www.academia.edu/8951226/Deconstructing_Villette.
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- 25** Fahmi Wael, Sutton Keith, Cairo's Zabaleen garbage recyclers: Multi-nationals' take-over and state relocation plans , "Habitat International" 2006, no. 30.
- 26** Fahmi Wael, Sutton Keith, Cairo's Zabaleen garbage recyclers: Multi-nationals' take-over and state relocation plans , "Habitat International" 2006, no. 30.
- 27** Stryker, Beth, Omar Nagati, and Magda Mostafa. Learning from Cairo: Global Perspectives and Future Visions. Cairo: Cluster, 2013. Print.
- 28** Stryker, Beth, Omar Nagati, and Magda Mostafa. Learning from Cairo: Global Perspectives and Future Visions. Cairo: Cluster, 2013. Print.
- 29** Stryker, Beth, Omar Nagati, and Magda Mostafa. Learning from Cairo: Global Perspectives and Future Visions. Cairo: Cluster, 2013. Print.
- 30** Stryker, Beth, Omar Nagati, and Magda Mostafa. Learning from Cairo: Global Perspectives and Future Visions. Cairo: Cluster, 2013. Print.
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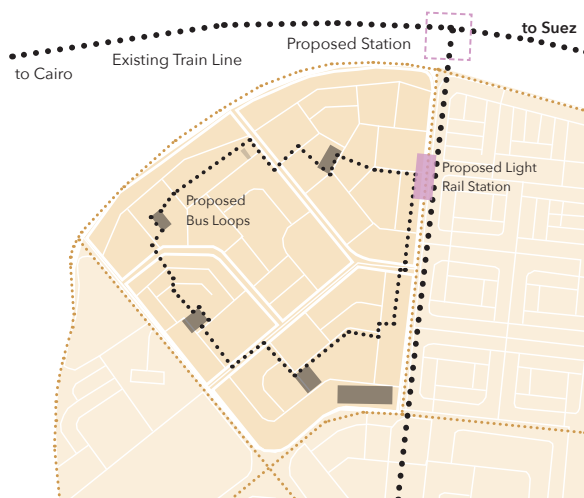




CHAPTER 7 SECOND STEPS TO URBANIZING THE DESERTED CITIES MOBILIZING “INFORMALITY” TO THE EXISTING DESERTED CITIES

Before exploring possible scenarios that could take place after having several underground or over-ground stations in a deserted city like Badr City, it is wise to rethink the notion of the station. It is also essential to understand the role the station could play to influence more people to access the deserted cities and trigger some “informal” activities around its realm.

The station needs to provide consistent crossing points and departure as a primary element that can cause the urban transition, acting as a portal that can receive an allocation of traffic that creates a connection. To achieve district-wide interaction, letting the station act as an effective conduit while enhancing local business growth and service delivery is wise. Therefore, the station needs to be more permeable to reinforce its linkage.



0 1 km

Figure 1 Mobilizing “Informality” in Zomoroda Housing Estate. Drawing by Author

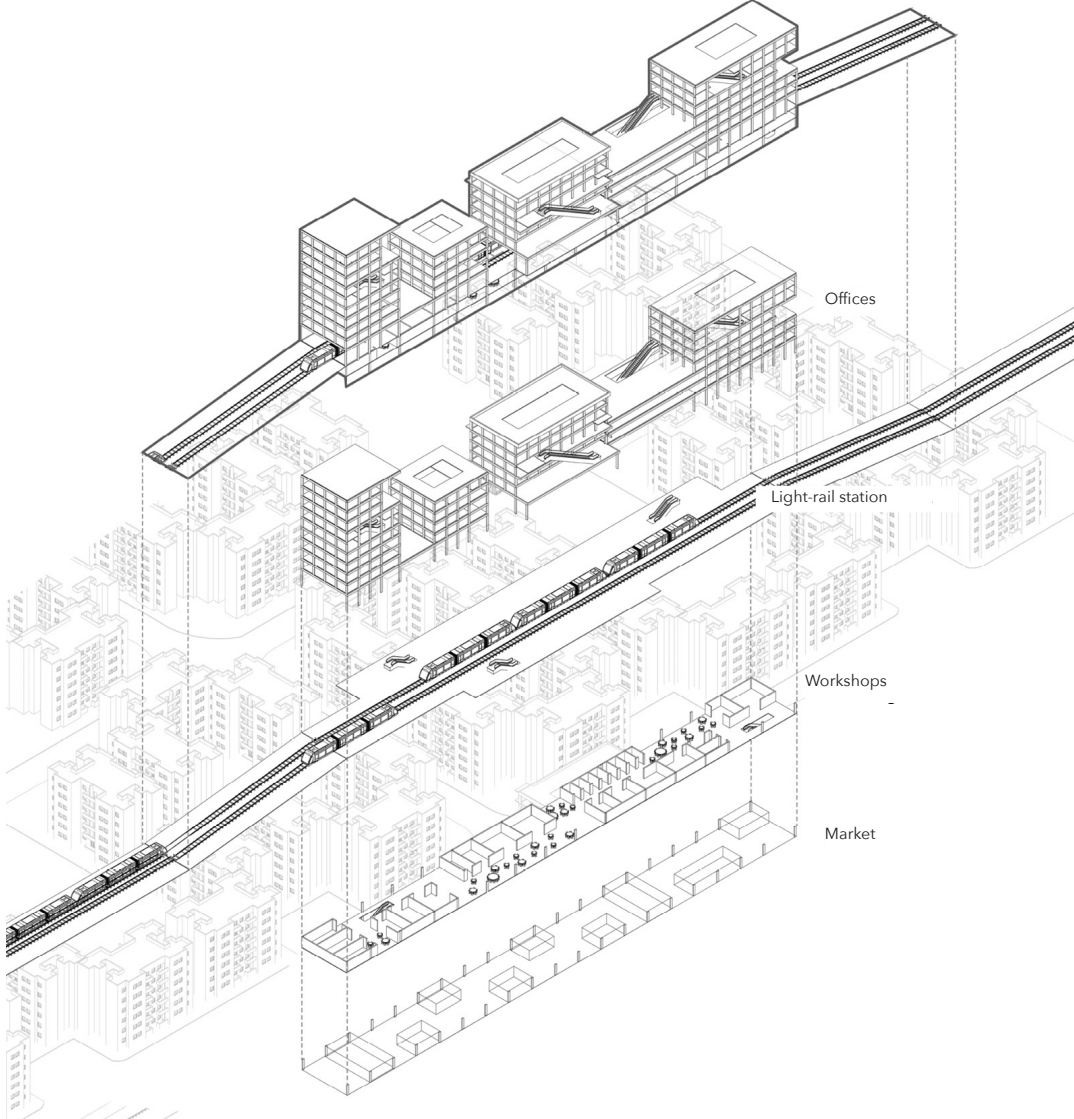


Figure 2 Dense Station Proposition. Drawing by Author

Transparency is also helpful in making the complex clear, especially on the ground floor. The use of skylights creates visual communication across floors. Glazed façades toward the squares smooth the thresholds between interior and exterior, enabling access to the station and providing a direct exchange between the station and its district. That approach is beginning to break the infrastructure line as a barrier. A station becomes the gateway to an urban area where new entrepreneurial movements and civic conditions can lead to synergies, which is necessary for a polycentric urban system.

When stations take place in all deserted cities, it is essential to build them on stages. That would help test how stations function and check how people react and use the station. It is also essential to test the possible “informal” activities that could start to happen in the realm of the station. Also, understand the possible architectural scenarios that could bring densification and intensification to the neighbourhoods. The following tests are hypothetical experiments that try to experiment with the possible bottom-up activities that could take place around the station.

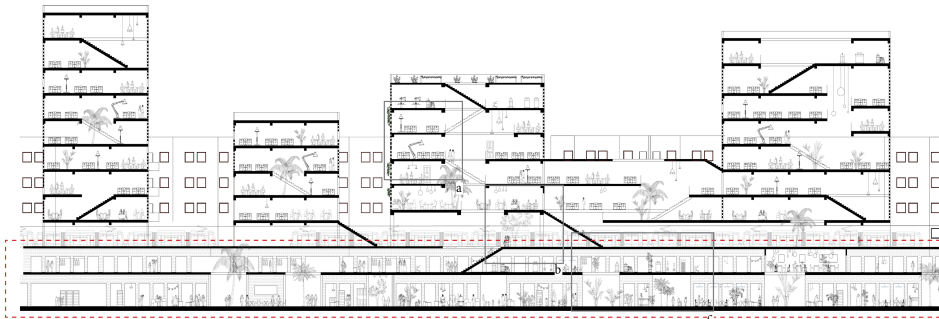


Figure 3 Diverse activities offered by the Station. Drawing by Author

The station is maintained by adding commercial programmes and economic activities by creating a threshold between the neighbourhood and the station. Souk's typology (Arabic street market) generates more flexibility for the residents. The self-regulated and self-determined enterprise supports that. Therefore, it creates a shared spirit of social responsibility in the public realm. Due to its non-determined structures, the souk artefact can absorb spatial and programmatic changes more effectively than typical commercial buildings, such as those used for shopping centres.

1. POSSIBLE SCENARIOS THAT THE STATION COULD BRING TO THE DESERTED CITIES

A. THE CHANNELLED SOUK

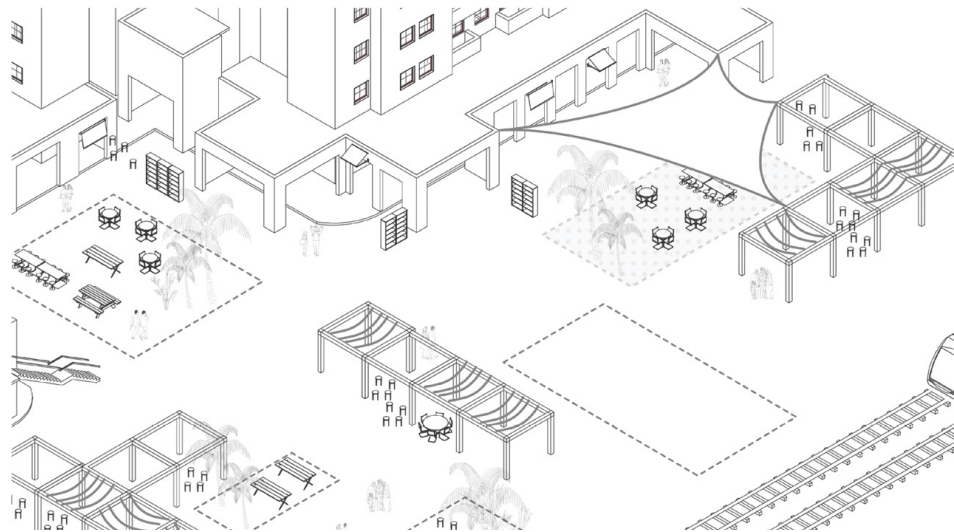


Figure 4 Exploring the Channelled Souk Typology. Drawing by Author

The Souk artefact is very common all over Egypt and North Africa. Often found in dense neighbourhoods as the official yet as a bottom-up market. Although it is a bottom-up initiative, it has a structure, rules and space hierarchy. The Souk plays a critical role in Egyptian neighbourhoods as it is a fundamental source of service delivery products: fruits, vegetables, food and beverages. Although there is a structure in most Souk typologies, it is critical not to romanticise "informality" in Souks and try to develop it and bring a better-planned system. Therefore, "channelled informality" is needed, where "informality" or bottom-up initiatives are dominant yet controlled. Thus, it can function in a way that works efficiently with all shareholders and different urban sectors.

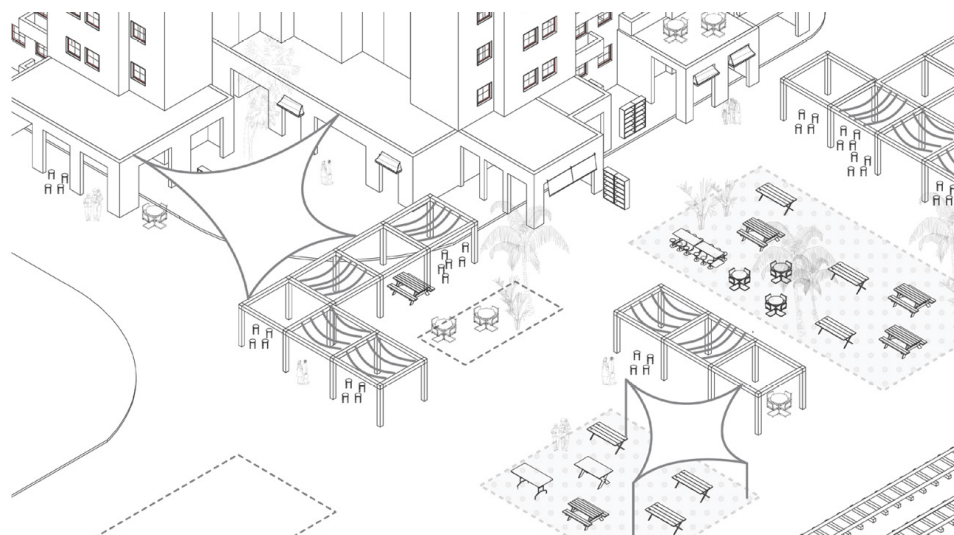


Figure 5 Exploring the Channelled Souk Typology. Drawing by Author

B. THE BOTTOM-UP BAZAAR

Another possible scenario that the residents could bring to the station district is the Bazaar typology (indoor market, naturally ventilated and linear in form). It would benefit the community by generating intensity through commerce-induced interactions. Furthermore, the collective urban and architectural extensions in Cairo's neighbourhoods could be replicated in a similar application, bringing high density to the deserted cities by extending structures in the public realm. That may lead to the creation of narrow streets that work best in the harsh desert conditions, which, at the same time, could offer work-home proximity by attracting commercial activities on the ground and first floors of the buildings.



Figure 6 Section for the experimented Bazar Typology, Drawing by Author



Figure 7 Bazar-i Qaysariyyah in Iran, source Herdeg, Klaus. 1990. Formal Structure in Islamic Architecture of Iran

The Bazaar artefact's primary strategy would be to increase the absorptivity of the public realm and create relationships between domestic life and the ground floor to raise the number of functions that may take place on the street. In doing so, it maximises the possible synergies that could take place between residents and local businesses.

By introducing Bazaar between residential buildings in the area close to the station, there is a better chance to create access throughout the neighbourhood. Also, this enhances the streets' permeability and helps create a more rich mixed-use district. Although it may be a complex structure to achieve from bottom-up or "informal" initiatives, the al Mu'tamidiya community case study of infrastructural ramps is a great model to learn from when considering the Bazaar typology as a scenario. Furthermore, the al Mu'tamidiya case study illustrates that the "informal" sector is capable of self-managing and self-planning sophisticated programmes, offering a different way of shaping and planning the city and responding to the residents' needs.

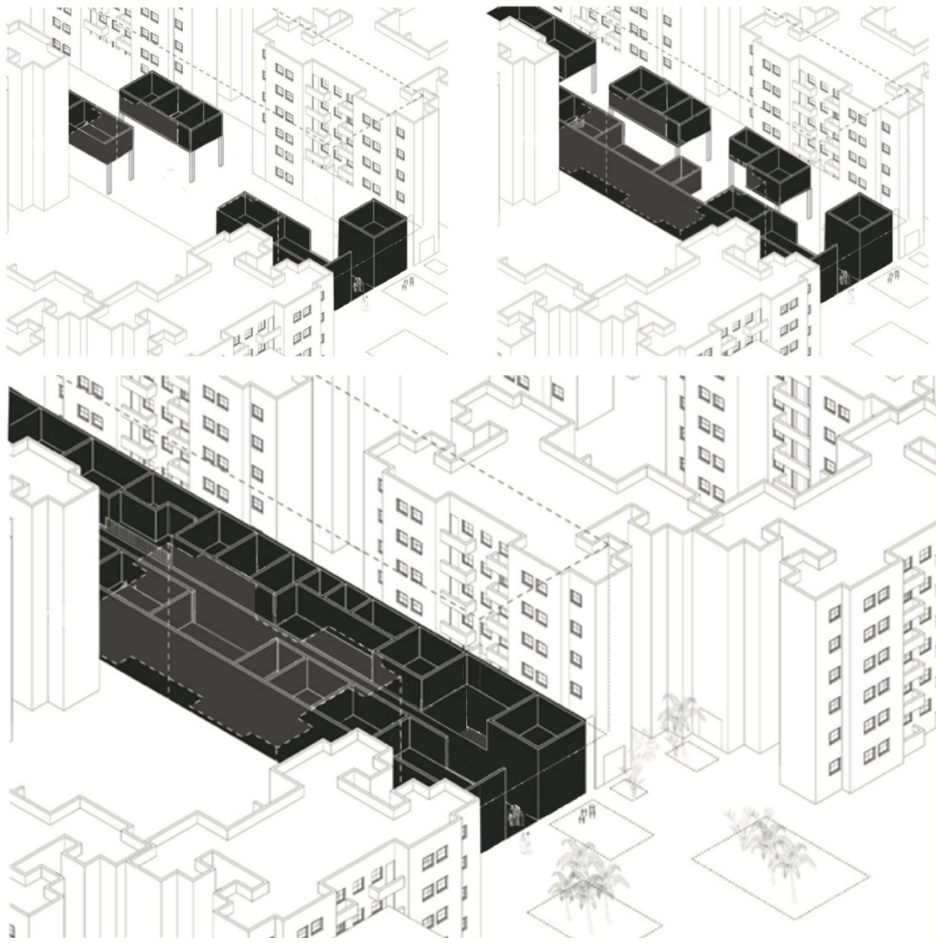


Figure 8 Hypothetical Steps of Extensions of the Bazaar. Drawing by Author

C. DISPERSED MALLS

Another scenario that the station could trigger is the dispersed malls (mixed service-delivery buildings). In moving malls away from the station, there is a possibility of generating an active public realm that supports the pedestrians' micro-mobility.

The shopping centre has to stop being seen as an obstacle to district-wide mobility and start to act as a supplement to it. For example, moving the malls away from the station creates transfer zones, generating an intensified public realm.¹ In doing so, there is a better chance of achieving more shared spaces and social mix. These are the main catalysts for providing a range of livelihood opportunities and economic ecologies.

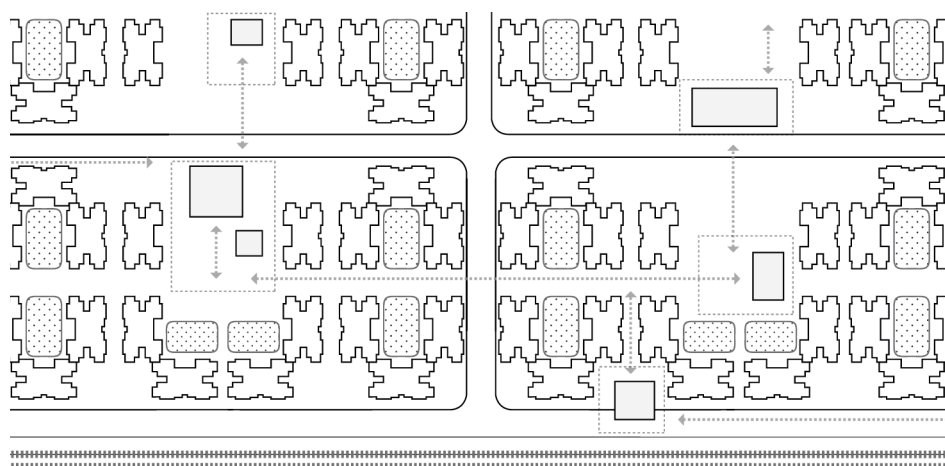


Figure 9 Figure 23 Station District: a Network of Dispersed Buildings, Drawing by Author

By increasing permeability in the public realm, materiality can play a role in guaranteeing permeability and the continued flow of people from the station to the dispersed buildings. By using transparent materials, internal programmes could project themselves towards the public realm and create synergies. For example, the building structure of the "informal" residential building in Cairo illustrates its flexibility by its simple 4m x 4m reinforced concrete structure. Dispersed buildings could attract diverse programmes by using a similar building technique. Therefore, the mall typology will be able to adapt to future changes and have the possibility of expansion.

The dispersed buildings could be developed by "informal" developers, similarly to "informal" Cairo developments. It proves to be a successful model in responding to the community needs, achieving flexibility, cheap rents and self-management.

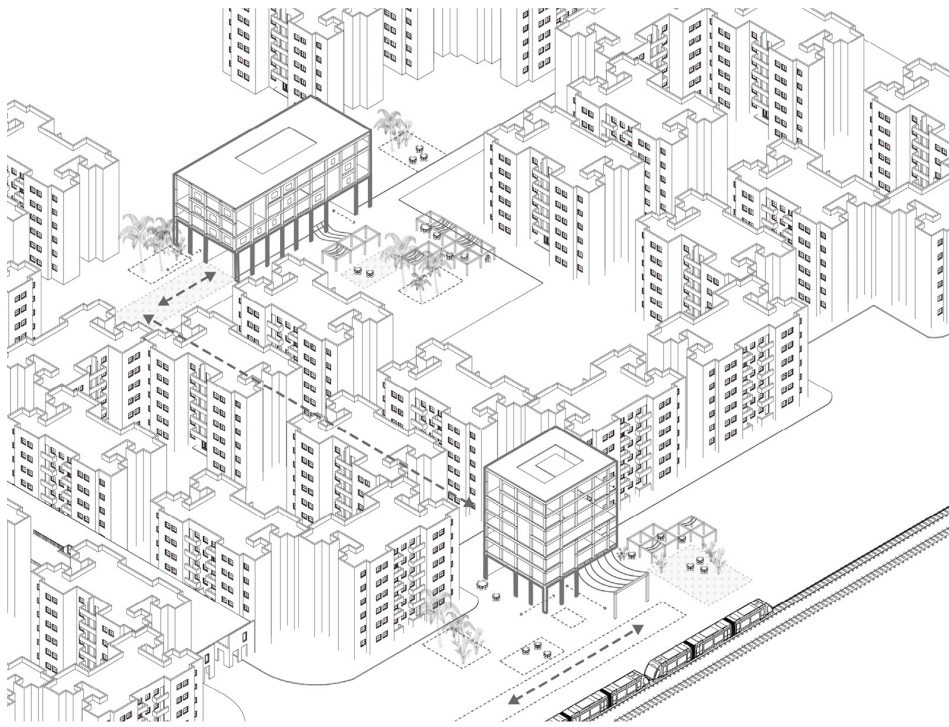


Figure 10 , Dispersed Malls in the realm of the station, Drawing by Author

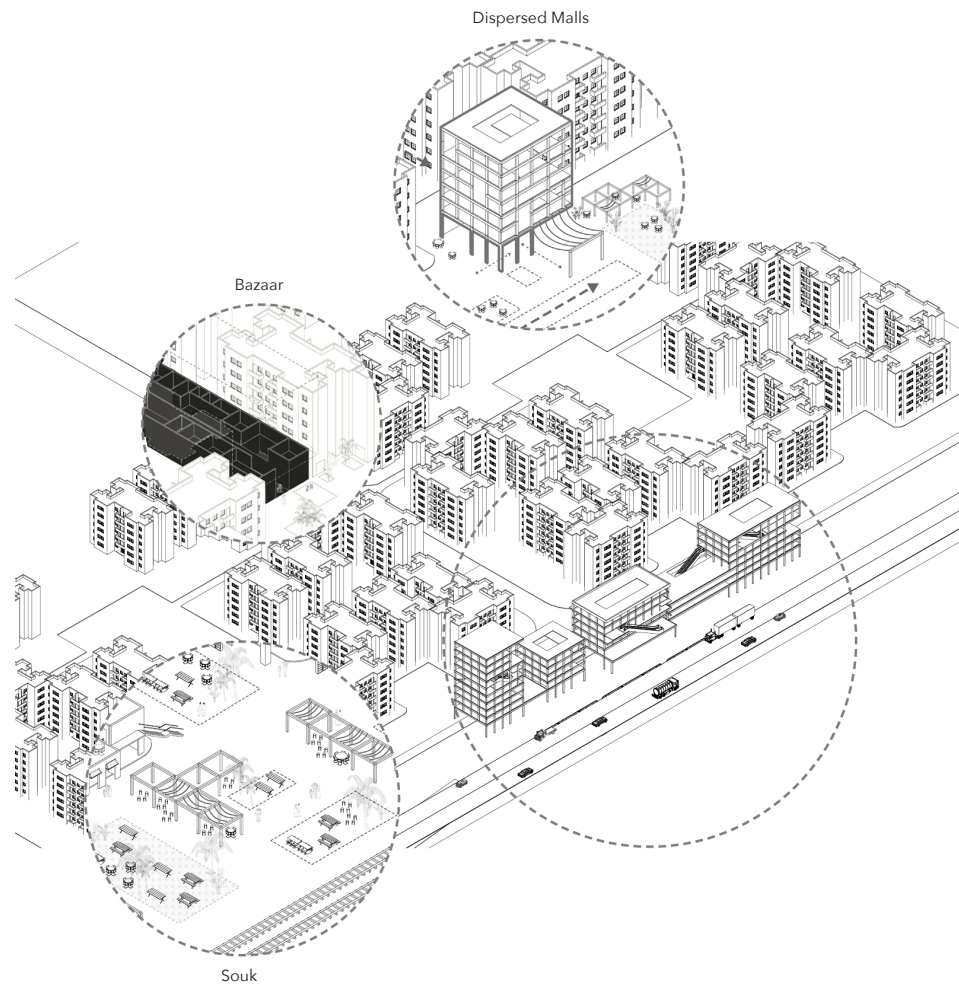


Figure 11 The Station as a Catalyst for Positive Change, Drawing by Author

2. MOBILIZING "INFORMALITY" THROUGH THE NEW STATIONS

2.1. THE "INFORMAL" TRANSPORTATION

In Cairo, "informal" initiatives have taken place in varying dimensions, creating a platform of study possibilities with proven credibility. As a result of their success, "informal" activities have forced the formal system to acknowledge them. Blurring the boundary between the "formal" and the "informal", the following case studies from Cairo articulate the epistemology of the "informal" as an alternative way of planning and shaping the city in a bottom-up manner.

Most "informal" areas of Greater Cairo are well located, with the majority 5-10km from the city centre. Traffic access into some of these areas is difficult, but privately owned micro-buses generally serve as a transportation model. Thus, inhabitants can easily access their jobs and daily needs in Cairo.²

"Informal" transportation systems have consequently emerged following failure and the inefficiency of the State initiatives to meet the demand for public transport. After proving their success, the state legalised the "informal" transportation system, which is now part of the formal transport system.³

Greater Cairo has been dominated by "informal" transportation methods for many years. The minibus network represents one of the main modes, servicing all clusters of Greater Cairo, particularly the "informal" areas that lack connection with the State-provided bus network. As soon as any new neighbourhood starts to form and grow into an adequate size, no matter how remote, the "informal" transportation system quickly covers that area, adding it to its network.⁴

A recent addition to the extensive "informal" transportation in the past ten years is the 'tuk-tuk'. The tuk-tuk is a rickshaw imported from India. It has proved to be a practical alternative travel method because they can efficiently navigate the narrow and unpaved streets of dense, "informal" areas and have very modest fares. Moreover, the Egyptian government has legalised them with formal licencing and plate numbers.

Extrapolating such bottom-up initiatives by allowing "informal" transport systems to evolve around the station could significantly contribute to enabling the desert cities to survive, grow and function effectively as urban areas.

2.2. THE "INFORMAL" MIX-USE TOWARDS A WORK-HOME PROXIMITY IN THE SUPER-BLOCK

After illustrating some critical case studies from "informal" Cairo and understanding some of their concepts, it is essential to rethink how to improve the existing ghosted neighbourhoods so they can accommodate new residents. In Badr City, the social housing superblocks consist of repetitive H blocks, organised on primary and secondary grids that compose U-shape morphologies and result in gigantic, un-built spaces forming a precarious neighbourhood. One of the benefits of this type of construction is the formation of clear visual lines and crossings, which may assist the State in space surveillance. However, such large unbuilt spaces also represent possibilities of generating processes that could urbanise the superblock.

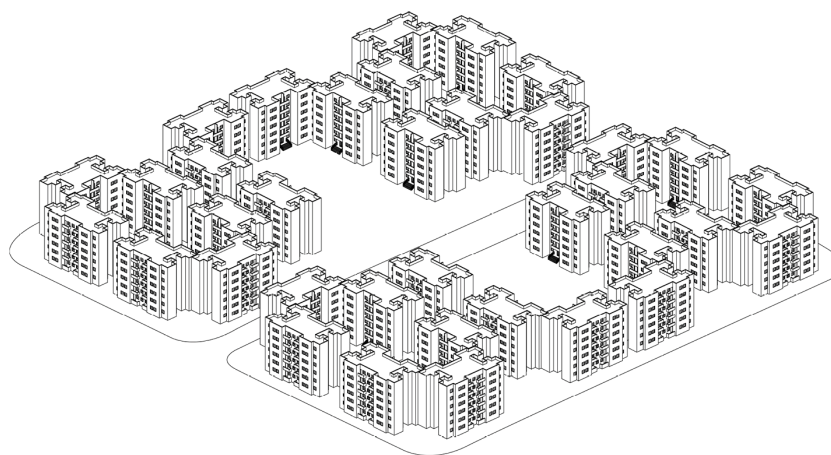


Figure 12 The typical Super-Block in Social Housing Estates. Drawing by Author

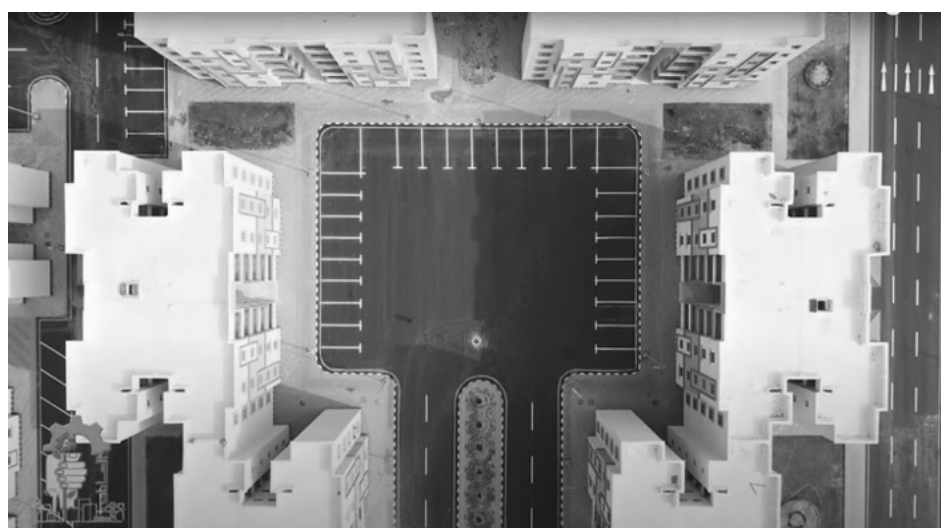
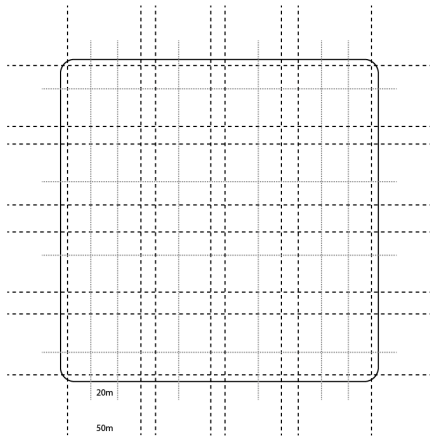
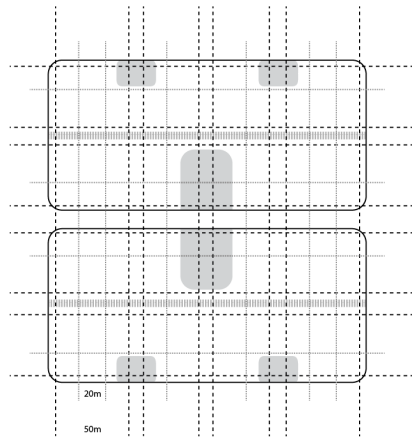


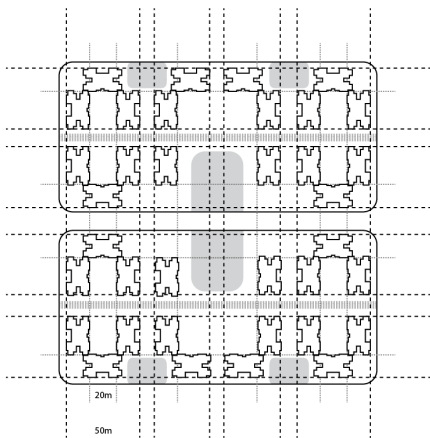
Figure 13 Social Housing Dwellings in Greater Cairo. Source: NUCA



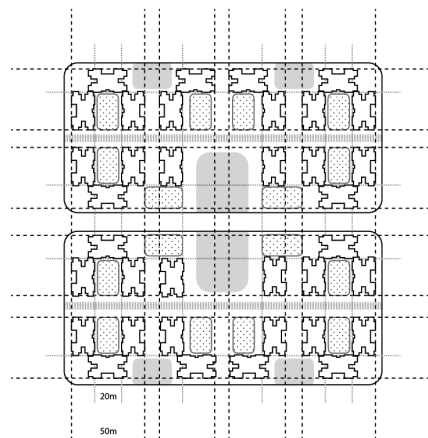
5.5 Decoding 01
Primary & Secondary Grids



5.6 Decoding 02
Car Parking & Sidewalks



5.7 Decoding 03
H Blocks



5.8 Decoding 04
Gardens

Figure 14 Understanding the Social Housing Super-Block in steps. Drawing by Author

A plan that envisions countering the precarity of the neighbourhood must be based on restructuring and reconfiguring the superblock system through introducing services and programmes that enhance permeability and improve the superblock's micro-mobility and the neighbourhood. In the following proposition, the large open spaces between the social housing units could host many programmes that could bring the "informal" neighbourhood qualities. In this case, commerce activities such as markets and shops could start as service delivery programmes to counter the housing monofunctionality of the neighbourhood. The grid system in this proposition creates a sense of flexibility in the market. It keeps all different programmes under one roof, avoiding the ambiguity of the typical market typology of Cairo.

Introducing creative industries and workshops will create synergies between the new residents and generate job opportunities to achieve work-home proximity. By introducing these programmes in dispersed buildings, there is a possibility of creating a plaza in the centre of the superblock that will enhance pedestrianised walkable spaces and improve the micro-mobility of the area. Transparent materials used on the ground floor of the buildings will help generate more linkage to the public in such a way as to make the activities of buildings become seamlessly part of the public realm. Offices, workshops and creative industries would benefit from the rich work-home generated proximity.



Figure 15 Introducing new Programmes to the Super-Block. Drawing by Author

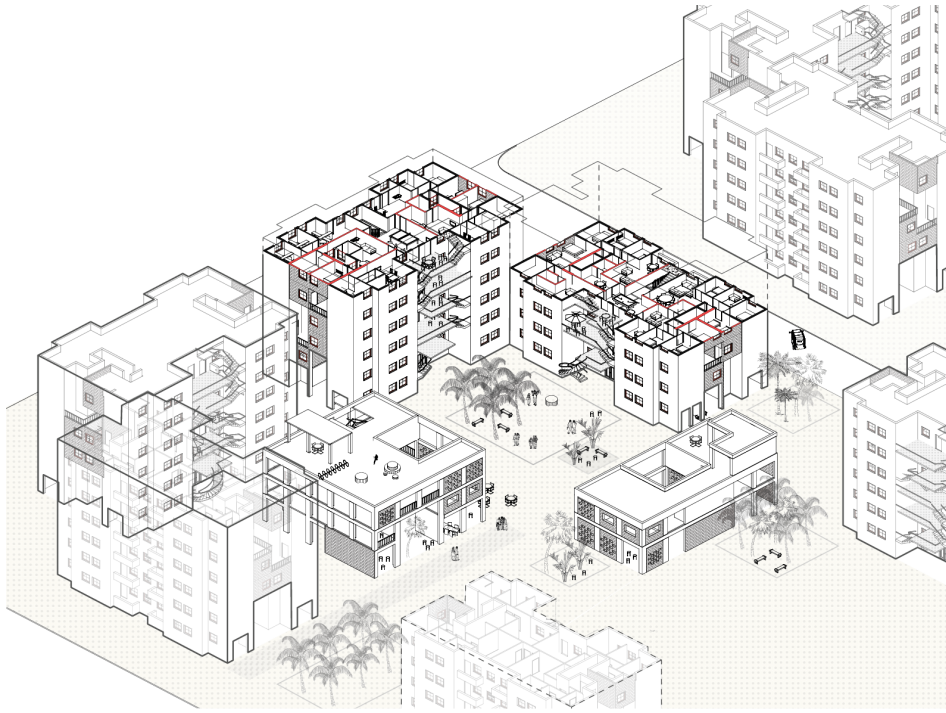


Figure 16 Introducing new Programmes to the Super-Block. Drawing by Author



Figure 17 Programmes as markets and commerce activities. Drawing by Author

Since no permeability is taking place in the H blocks as the ground floor is only for residential use, one of the possible activities that the new residents could bring to the superblock is removing some walls on the ground floor and allowing permeability to happen. That, however, allows more social activities and programmes to take place since domestic life relies fundamentally on the ground level to enhance public life.

A system of façade and edge treatments will attract different programmes and uses, creating a sequence of threshold-generating linkage and connectivity between the public realm and the dwellings. Since activities on the ground level are substantial for creating a rich and healthy environment, programmes like workshops, retail space and offices would benefit from such a configuration and collaborate in the funding scheme.



Figure 18 Social Housing in Badr City. Source: NUCA and Invest Gate



Figure 19 Mono-functional Ground floor in the Social Housing Estates. Source: Egypt Today

By rethinking the design parameters, there is a chance to open up the architectural elements to start building a fundamental role in the urban field. This form of action represents a different methodology of rethinking and shaping the city, where bottom-up initiatives collaborate to bring essential solutions to counter the precarious condition of the State's one-fit solution.

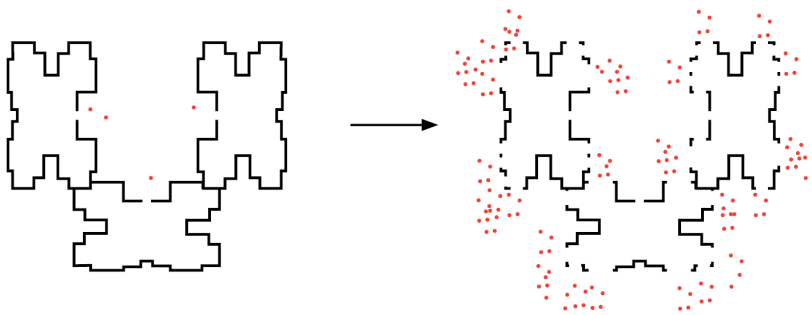


Figure 20 From a Blocked Ground Floor to an Open & Permeable Ground Floor

Social life in Cairo depends mainly on integrating multiple activities in the public realm. However, the organisation and morphology of the H-blocks with their large unused and unbuilt spaces do not efficiently assist in creating the synergies that achieve connectivity. In response to this challenge, the horizontal extension on the ground level could become a scenario that would create a vibrant public life as it mixes various businesses, services and activities to encourage work-home proximity. Furthermore, such morphology creates a good environment that counters the harsh desert climate, where shadows take place over public spaces. That would create an arrangement that enables the residents to activate businesses, services and employment possibilities.

The horizontal expansion generates a broad spectrum of collectives; based on inter-connection, close-knit patterns of organisation, and possibilities for growth. The flexibility of the structure makes it a successful model, as it is composed of ready-made timber columns and beams. It is commonly present in "informal" Cairo as it hosts communal spaces, such as street markets, street weddings, funerals and other community events.



Figure 21 Making the Ground Floor more permeable. Drawing by Author

The specific nature of the Super-Block imposes interventions on both the architectural and the urban scale. To see how the inhabitants of the area could become stakeholders of a self-regulated organisational effort, one can explore different scenarios that illustrate how residents would react toward the superblock and trigger an ongoing bottom-up process to reshape the neighbourhood.



Figure 22 Pedestrian Qualities created by the propositions in the Ground Floor. Drawing by Author

Integration starts when the association of all these elements: morphology, elevations, functions, transparency, and social associations start to work together as a whole; to introduce differentiation patterns. Revitalising the area socially, spatially and economically is an objective that will only be achieved through consensus organisations, turning the superblocks into work-home proximity blocks by continuously adding and incorporating service delivery, business and communal spaces.

2.3. THE "INFORMAL" HOUSING LEARNING FROM "INFORMAL" CAIRO CASE STUDIES CASE STUDY 1: HELWAN WORKING ESTATE

Helwan Workers Estate was initially built with relatively wide spaces between blocks. However, residents' extension activities have transformed it into an urban layout of narrow streets that are much more suited to the harsh desert climate of Egypt. Likely, the construction process has created a sense of community and identity as residents constructed the extensions collectively and sometimes built some structures themselves.⁵

Acquiring a minimum of three living spaces in every apartment seems to be the main reason the inhabitants require augmenting their living space. For example, kitchens, one of the smallest spaces in the unit, cannot be used as an eating area. Therefore, inhabitants often opt to extend into the balconies to increase the eating space. Such augmentations increase the size of a unit by about 60 per cent of its original size. Hence, households with only two rooms now live in 3.1 rooms.⁶

Similarly, expansions and additions to the flats are common in Imbaba, so it is not easy to recognise the initial design from the additions. Public housing tends to have generous spaces between buildings. The expansion of apartments has called for much co-operation between neighbours, especially when residents of an upper floor needed to extend. Extensions and modifications are significant in ground-floor apartments as people convert some of their spaces to commerce as internet cafés and barbers.⁷

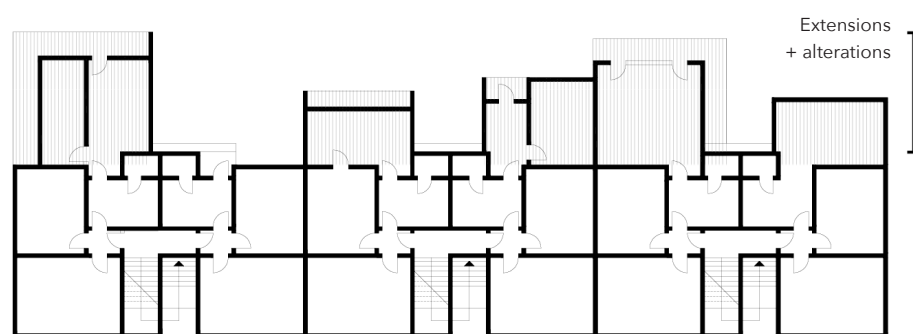
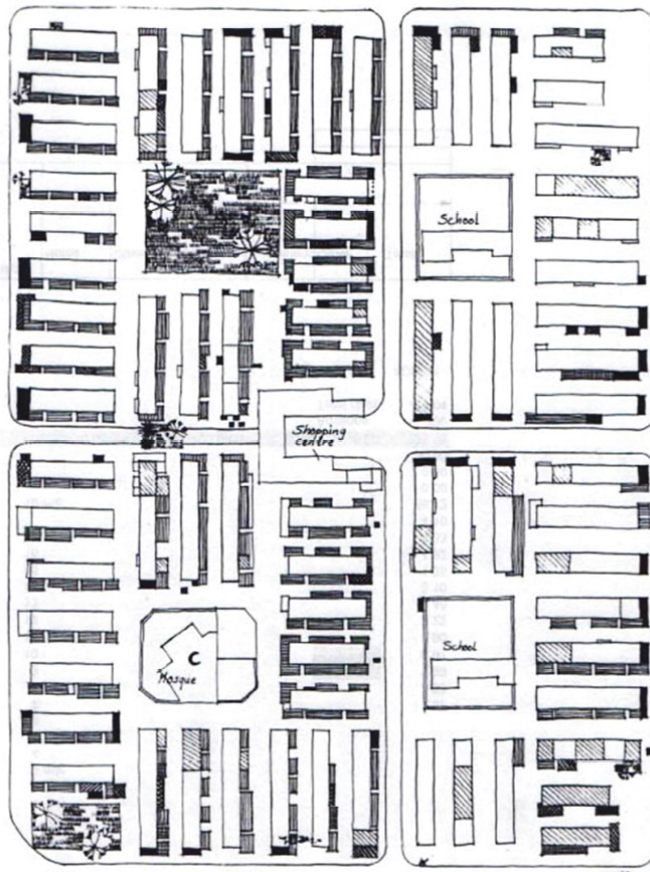


Figure 23 Extensions in Helwan Working Estate. Diagram by Author



■ ■ ■ Extensions + alterations

Figure 24 Extensions in Helwan Working Estate. Source: Mathey, Kosta. *Beyond Self-help Housing*. London: Mansell, 1991. Print.)



Figure 25 Extensions in Helwan Working Estate. Source: Mathey, Kosta. *Beyond Self-help Housing*. London: Mansell, 1991. Print.)

CASE-STUDY 2: THE "INFORMAL" DWELLING

Since housing is a substantial element in the city's production, it is critical to understand how the residential space functions in the "informal" sector and the factors behind its success. The multiple units per floor dwelling (MUPFD) is the dominant housing typology in "informal" areas. Four residential units are usually distributed on each floor with diverse unit sizes, from 50 to 82 square meters, placed around a core of 18 square meters. Widespread extensions take place vertically and horizontally, responding to dynamic social needs and changes. Productive programs take place on the upper floors, while primary commerce activities and storage dominate the ground floor, enriching the street and the public realm.⁸

The Rab' building typology is the second most dominant dwelling in "informal" settlements. Its components are similar to the multiple units per floor dwelling (MUPFD), but its ground floor usually accommodates mosques and other administrative functions. As with the MUPFD, the floors typically host various domestic-sized units and communal and shared spaces.⁹

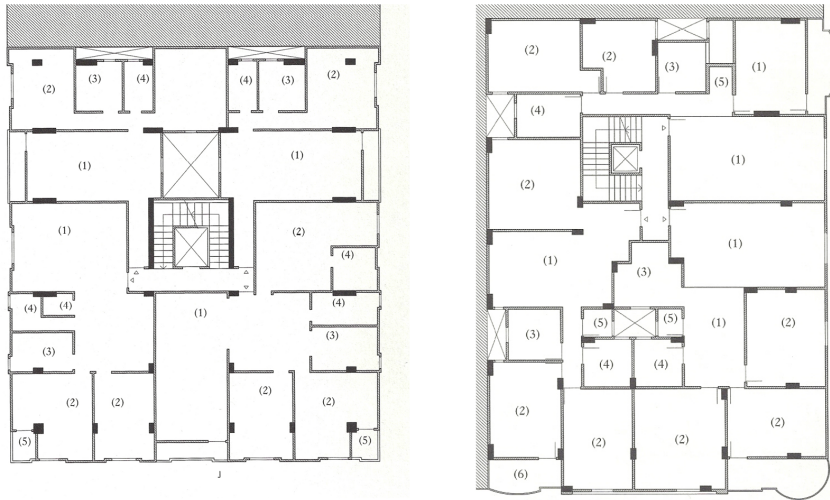


Figure 26 Typical “informal” dwelling floorplan. Source: Angelil, Marc, and Charlotte Malterre-Barthes. *Housing Cairo: The Informal Response*. Berlin: Ruby, 2016. Print.

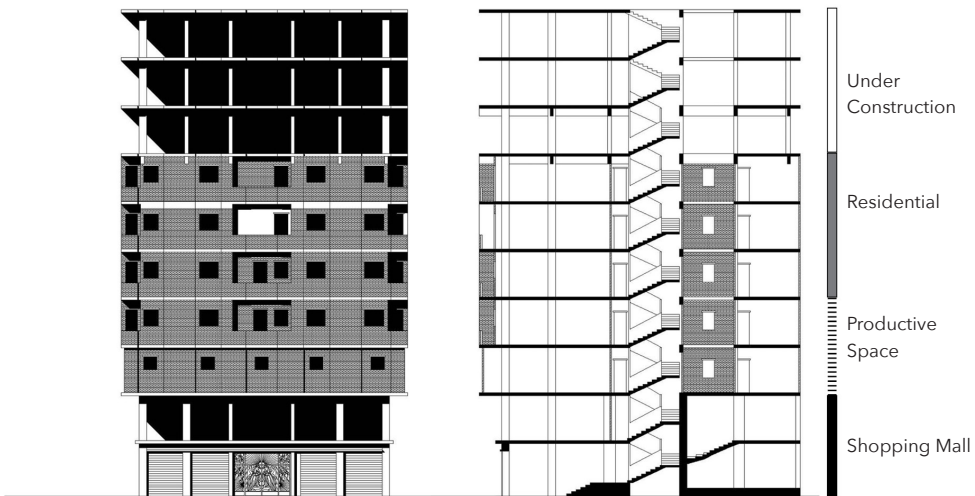


Figure 27 Typical “informal” dwelling elevation & section. Source: Angelil, Marc, and Charlotte Malterre-Barthes. *Housing Cairo: The Informal Response*. Berlin: Ruby, 2016. Print.

The "informal" sector's residential buildings are renowned for their flexibility due to their flexible structure of a 4m x 4m reinforced concrete system. That ensures that the system can extend or alter to accommodate a variety of programmes. Consequently, the patterns presented may differ from the conventional design of the housing units. However, they can display diverse and creative examples that have not been introduced by an architect but emerged from the needs of the inhabitants. In other words, it is an architectural translation of social and economic needs.¹⁰



Figure 28 The "informal" dwellings. Source: Angelil, Marc, and Charlotte Malterre-Barthes. *Housing Cairo: The Informal Response*. Berlin: Ruby, 2016. Print.

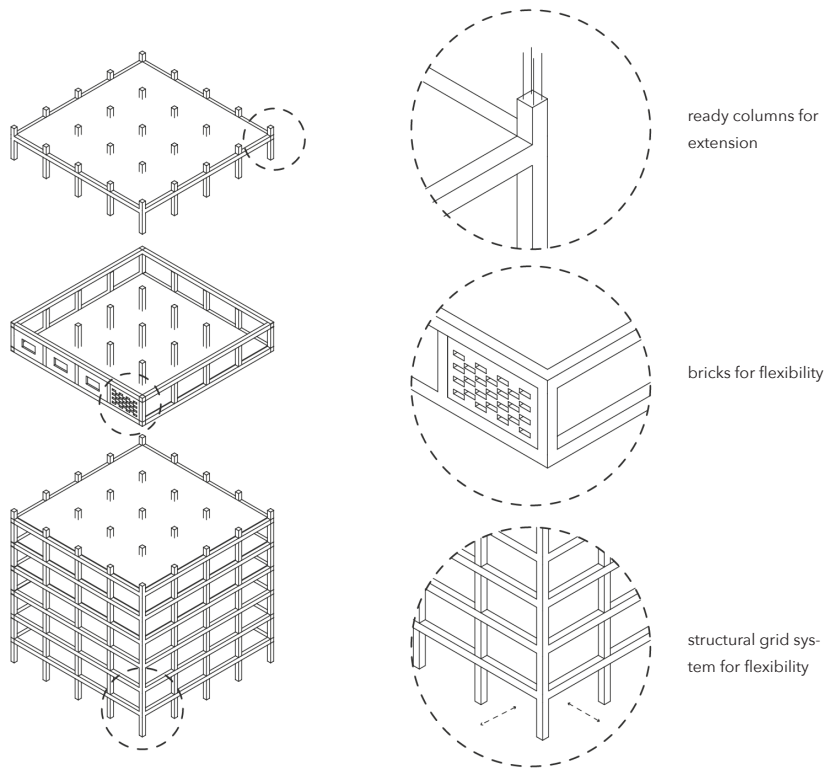


Figure 29 The flexibility of the structure: Angelil, Marc, and Charlotte Malterre-Barthes. *Housing Cairo: The Informal Response*. Berlin: Ruby, 2016. Print.

Articulating these ideas could help address the question of the domestic space in deserted cities and help the urbanisation process. That is not to romanticise the "informal" because safety, hygiene, and the absence of efficient infrastructure are pandemic problems in "informal" settlements. However, when a built environment is self-financed, demand-driven, develops organically, is consolidated, has low energy needs, is walkable, self-sustaining and provides work-home proximity, how can it be considered a failed architecture? This list of features representing "informal" settlements in Cairo reads like a sustainability index.¹¹

THE NOTION OF EXTENSIONS AND RE-MODIFICATION OF THE DWELLINGS

The building of "informal" extensions on the Super-Block will assist in countering the harsh desert conditions. New residents can self-build well-structured reinforced concrete extensions that respond to local domestic and urban needs. Architectural extensions could happen horizontally and vertically, allowing more diverse programmes and activities to occur. Architectural extensions on the ground floor will lead to the formation of service delivery industries such as shops, cafes, restaurants, offices and other fundamental programmes that support neighbourhood life. Extensions on the upper floors create more flexibility for the inhabitants to become flexible to their lifestyle, family size and space usage.



Figure 30 An illustration of the possible extension scenarios. Drawing by Author

These extensions affect not only the urban environment but also the "informal" economy, as it mainly thrives on small-scale projects. It offers job opportunities for local developers, local labours and local materials. Therefore, offering a sustainable logic for building the city. By allowing extensions to happen by the "informal" sector, the process helps to generate more freedom for individuals to be enterprising on a self-regulated scale. As collective efforts do architectural extensions, it allows the residents to integrate and have strong ties. As a result, inhabitants of the area become members of an organization and stakeholders in projects.

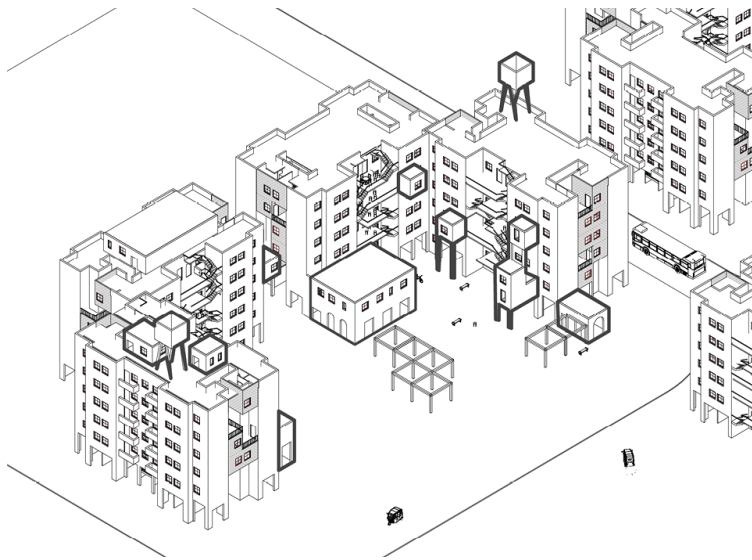


Figure 31 Illustrating the possible first steps of the self-made extensions. Drawing by Author

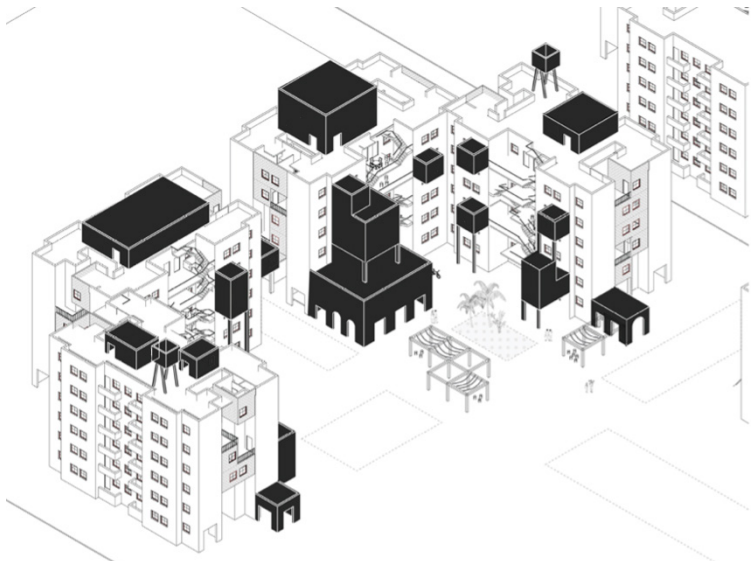


Figure 32 Possible phases of horizontal and vertical extensions. Drawing by Author

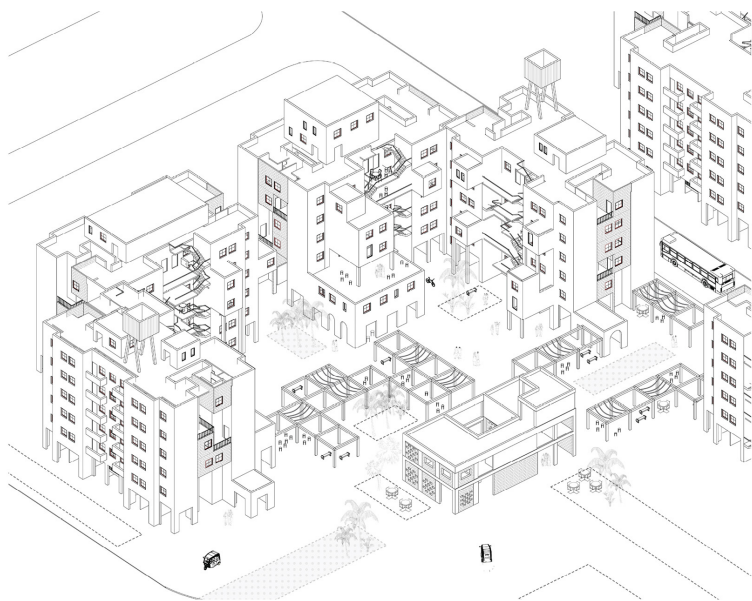


Figure 33 Later phases of horizontal and vertical extensions. Drawing by Author

Since different typologies can attract a varied population, from families to individuals, by offering various types of residential units, there is a better opportunity to attract a spectrum of people. Moreover, as the existing apartments are generous in space (90m²), splitting the apartments offers new typologies to immerse and creates new rental opportunities. Rents help residents sustain a comfortable living and offer a steady income for the owners to help in future alterations and extensions of their domestic space.

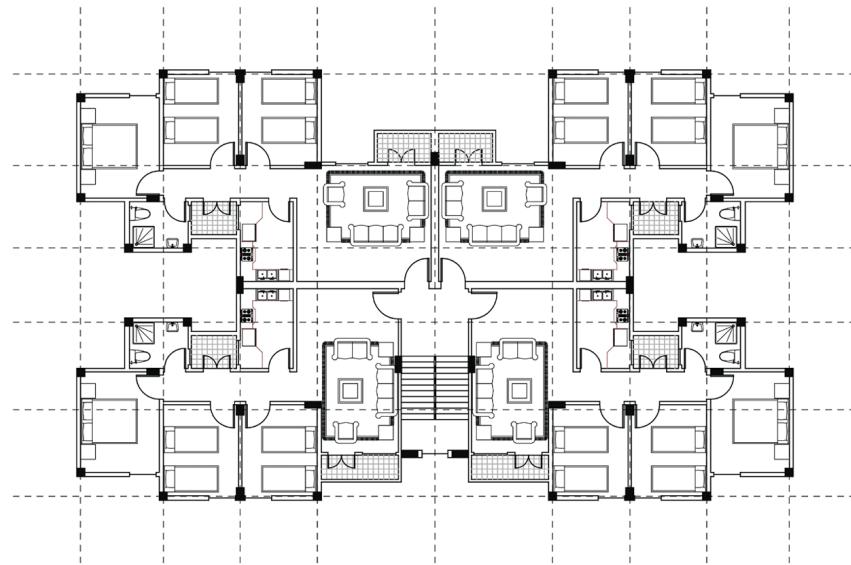


Figure 34 Plan of the Typical H-Block. Drawing by Author

Due to the symmetrical organization of the building structure, plans have the potential to offer different units per floor, as the reinforced concrete system offers this flexibility. Through the plan explorations, each storey could have a variety of apartments, from four to six units, from apartments to small studios, providing flexible opportunities for diverse domesticities.

To generate a social mix and synergies between residents and to create work-home proximity, new programmes could start in the H Blocks. Learning from al Rab' case study, programmes that encourage local businesses, workshops and services will enrich the living conditions of the area.

To create synergies, a plan may be required to reconfigure communal and shared spaces. The use of communal spaces in "informal" Cairo housing shows that it plays a substantial role in creating linkages and synergies between the inhabitants. It generates a possibility for residents to share social and economic activities.

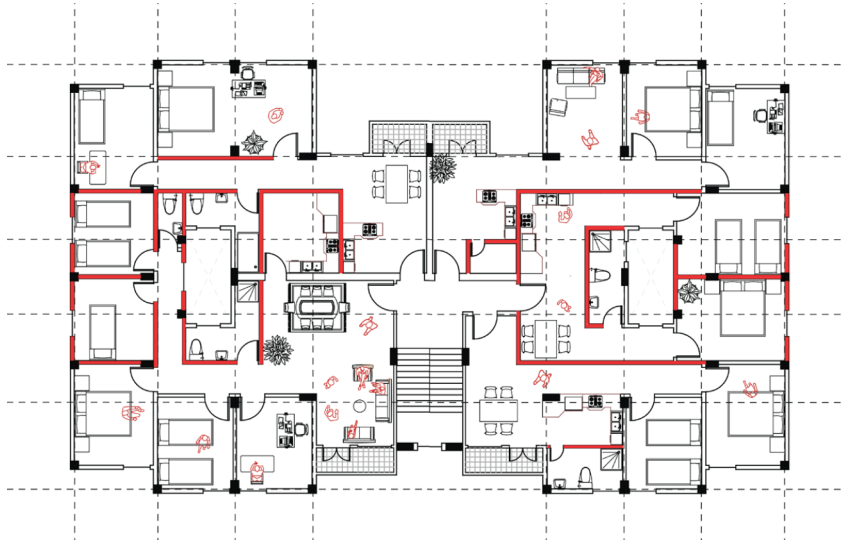


Figure 35 Possible scenario of readapting the current floorplan layout to accommodate more residential typologies. Drawing by Author

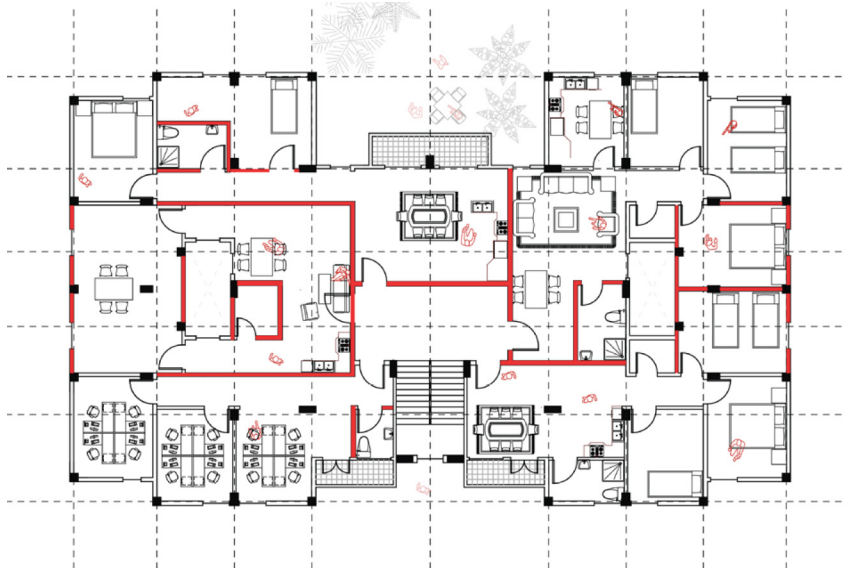


Figure 36 possible scenario of adding new programmes to the typical floorplan as office spaces. Drawing by Author

The existing floor plan could become more flexible by offering an adaptable space for communal activities between the stairs and the balconies. Therefore, communal spaces become the catalyst of change, allowing residents to meet and interact. Cooking, dining and children playing activities are familiar in most communal areas in "informal" Cairo, where social integration is supported, and individuals feel they are stakeholders of a wider community.

A different organization and orientation of the apartments' communal spaces and their balconies can be explored, enabling the projection of a collective life towards the public realm. A sequence of open communal areas creates a rich network between the apartments, where the neighbourhood enriches by serialization of interactions and exchanges.

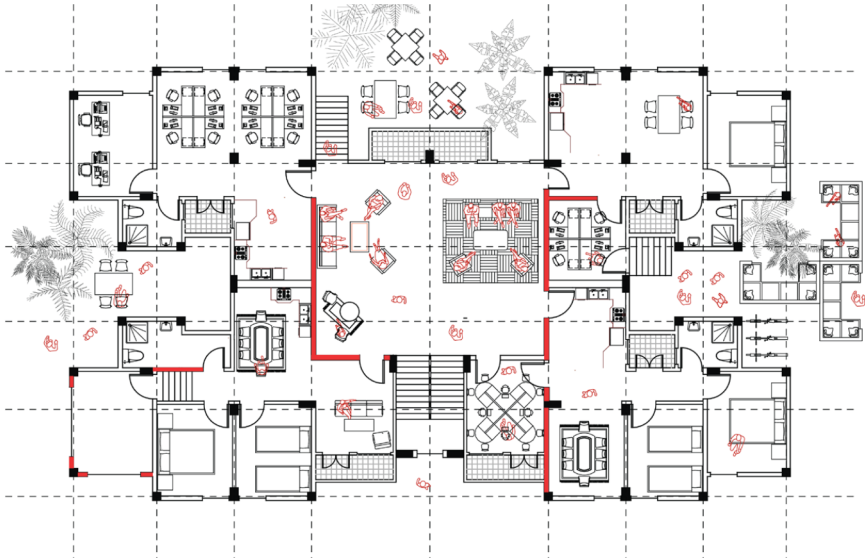


Figure 37 A scenario of adding a communal space in the ground floor. Drawing by Author

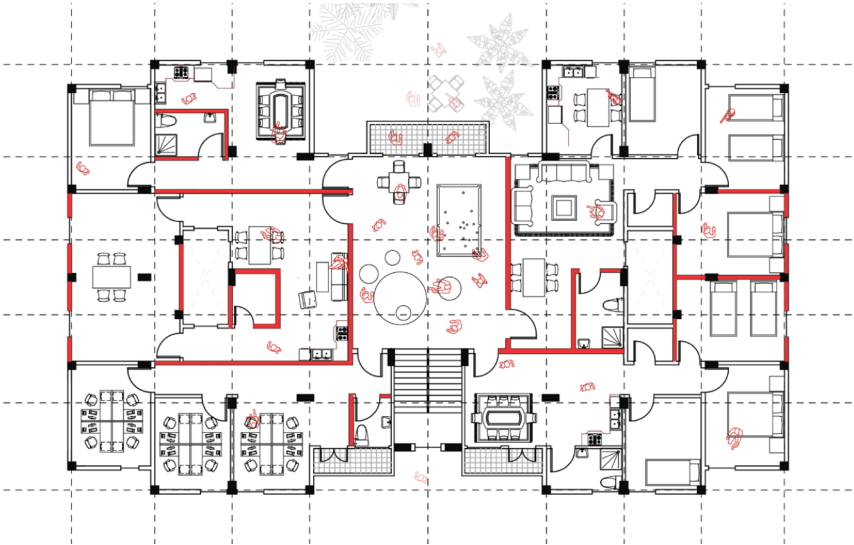


Figure 38 Illustration of how the communal space could take part in every storey. Drawing by Author

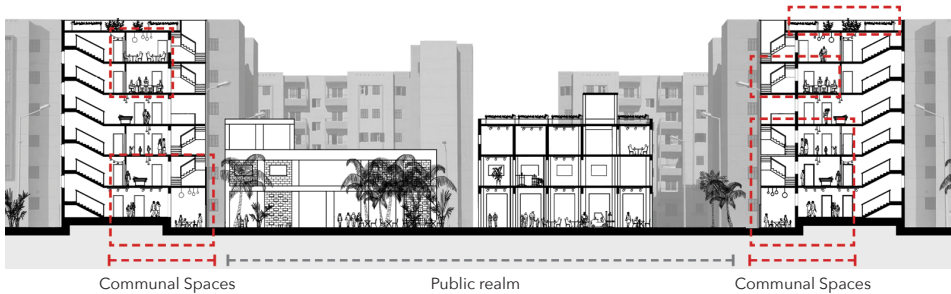


Figure 39 Communal spaces as a catalyst to bring social life. Drawing by Author

The need for flexibility is fundamental to the Egyptian family. As family sizes change over time, there is a requirement for space extension and alteration to enhance and improve living conditions to suit lifestyle needs. Extending on the sides of the H block could be a possible scenario, as it allows each unit to add extra rooms when needed, where shafts stay clear to allow ventilation for bathrooms and kitchens. That could generate diverse scenarios of domestic typologies and introduce new economic programmes to the dwelling.

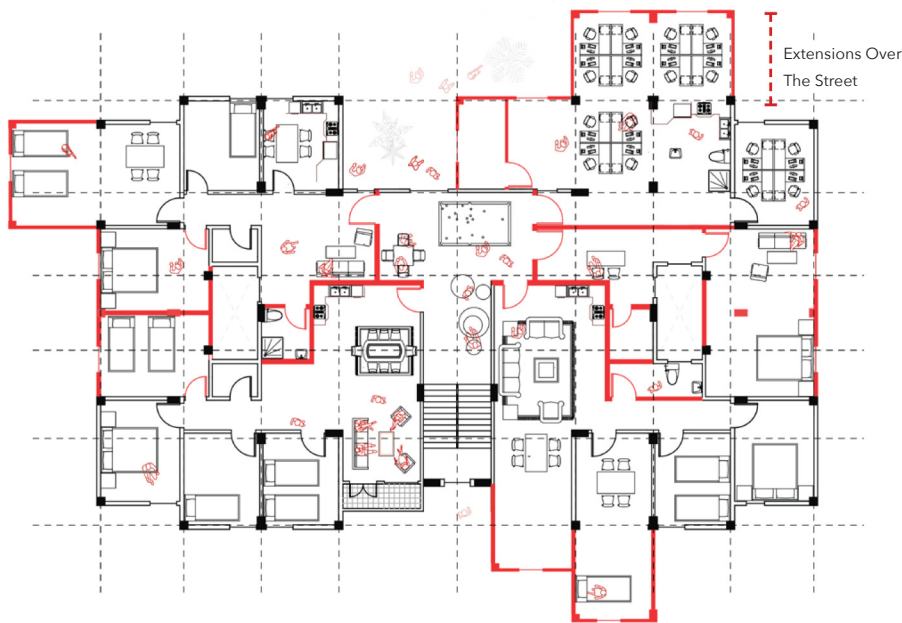


Figure 40 Possible extension to create some flexibility for the residents. Drawing by Author

The residents could take extensions to a different level by expanding into the streets and the public realm, enriching the street environment by offering narrower streets and accommodating new service delivery programmes on the ground floor. The process of self-extension is a collaborative and consensual process that integrates different stakeholders to make decisions that respond best to their needs, offering an alternative way of planning the city.

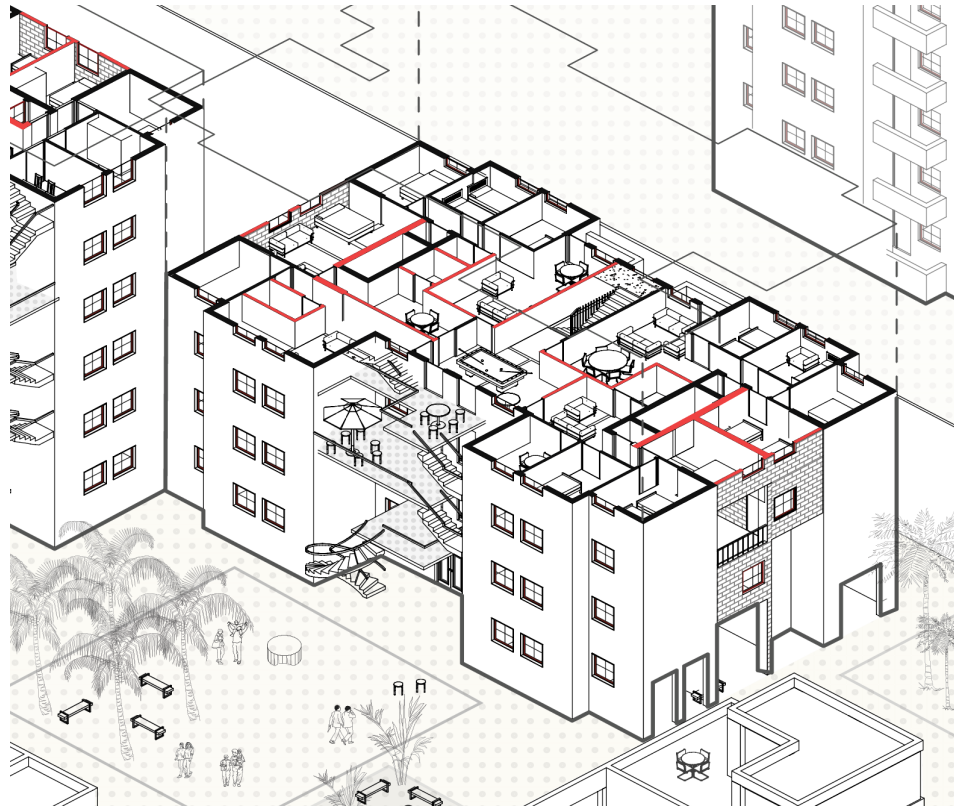


Figure 41 Possible changes in the ground floor and the morphology of the H Block. Drawing by Author

Through floor-plan explorations, differentiation, flexibility, extensions, and communal spaces could be substantial reconfiguration parameters. That would expand the domestic areas, create a significant contribution to the urban realm, and enhance the qualities of public spaces. The exploration aims to represent how design could play a key role in influencing housing quality and solving some social housing problems. The "informal" sector can contribute significantly to rethinking and reconfiguring residential space and the public realm, where the explored scenarios could become part of the retrieving and urbanizing process. Architecture plays a critical role in the urban quality of a district as it creates the basis upon which all initiatives intersect to enhance the quality of life over the long term.

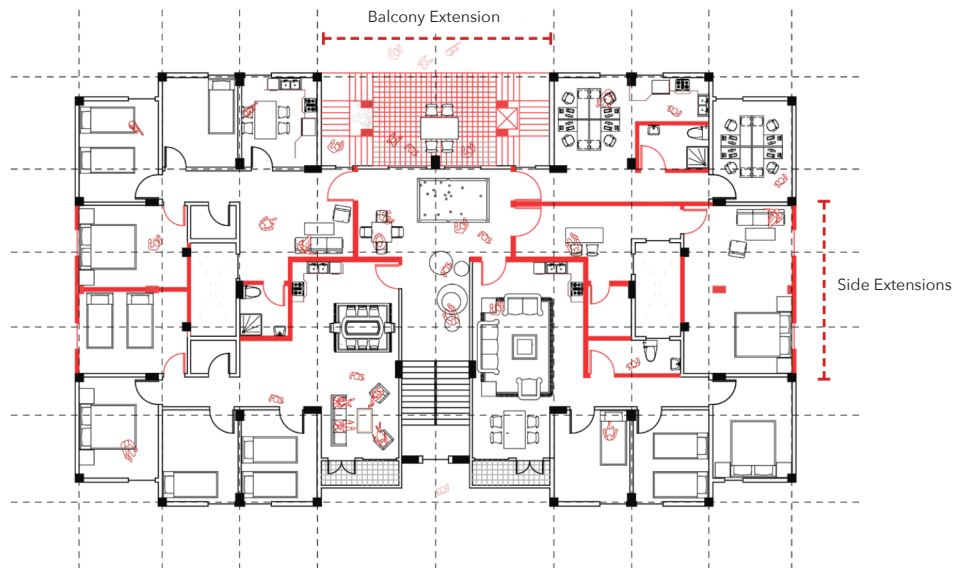


Figure 42 Possible Extensions in the boundaries of the H Block. Drawing by Author

The illustrated propositions to urbanize the deserted cities need to be tested in specific areas for some time to examine the outcome and the actions' consequences. It is critical to understand that the new propositions should adapt to the outcome results to secure a better mechanism of inhabiting deserted cities. It is a process that needs to develop over time. Therefore, it is fundamental to understand how people will react to those propositions on a smaller scale before expanding this mechanism to larger-scale areas and desert towns.

INCENTIVES TO BRING NEW RESIDENTS TO THE DESERTED CITIES

Although the mentioned propositions can influence the urbanization of the deserted cities, the State must give some incentives to people to attract them to move to the desert cities. Without those incentives, the urbanization process will be slow, and it might take years to urbanize the deserted towns. Cairo with all its problems has succeeded in attracting residents from different cities and villages; to its spectrum of a platform of possibilities that people need.

Physical Environment:

1. Offer a diverse range of housing typologies
2. Introduce a sustainable public transportation system
3. Build various public spaces
4. Support renewable energy at subsidized costs

Political Environment:

1. Introduce laws to support less bureaucracy for owning flats and businesses
2. Digitalize the process of ownership and rental system to counter corruption
3. Support subsidization of many facilities to attract residents and businesses

Social Environment:

1. Offer well educational institutes at reduced fees for the first years
2. Introduce a well-subsidized healthcare system for the first years
3. Create a spectrum of sports and recreational facilities
4. Build religious facilities
5. Support cultural programmes as museums and theatres

Economic Environment:

1. Reduce taxes on residents and businesses for their first years
2. Easier bank loans for owning apartments or businesses
3. Allowances to residents and businesses
4. Reduced rental prices for the first years
5. Reduced prices of transportation tickets for employees
6. Help residents and businesses own/share vehicles

- 1** Moro, Mariana Cenovicz. Education + Housing: Extroverted Models to Achieve Integration. Thesis. AA, 2015. N.p.: n.p., n.d. Print.
- 2** Stryker, Beth, Omar Nagati, and Magda Mostafa. Learning from Cairo: Global Perspectives and Future Visions. Cairo: Cluster, 2013. Print.
- 3** Stryker, Beth, Omar Nagati, and Magda Mostafa. Learning from Cairo: Global Perspectives and Future Visions. Cairo: Cluster, 2013. Print.
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- 5** Mathey, Kosta. Beyond Self-help Housing. London: Mansell, 1991. Print
- 6** Mathey, Kosta. Beyond Self-help Housing. London: Mansell, 1991. Print
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CHAPTER 8 TOWARDS MOBILIZING "INFORMALITY" TO NEW DESERT CITIES A NEW DESIGN METHODOLOGY FOR DESIGNING NEW CITIES

Top-down urban planning and decision-making have proven earlier their inability to meet individual needs. Unfortunately, deserted cities around the world share that design methodology feature. Examples of deserted towns are not only an Egyptian feature but also found in China, Turkey, South America, Asia and the south of Europe.¹

This chapter proposes a set of architectural and urban principles that can create a better civilian new urban environment that sustainably reflect more on individual needs. The following hypothetical propositions aim to present a different process of designing and building the urban environment. The proposed notions are only the first steps in this design methodology. Further analysis, tests and research are critical to finalising the ideas.

1. TOWARDS LINEAR GROWTH

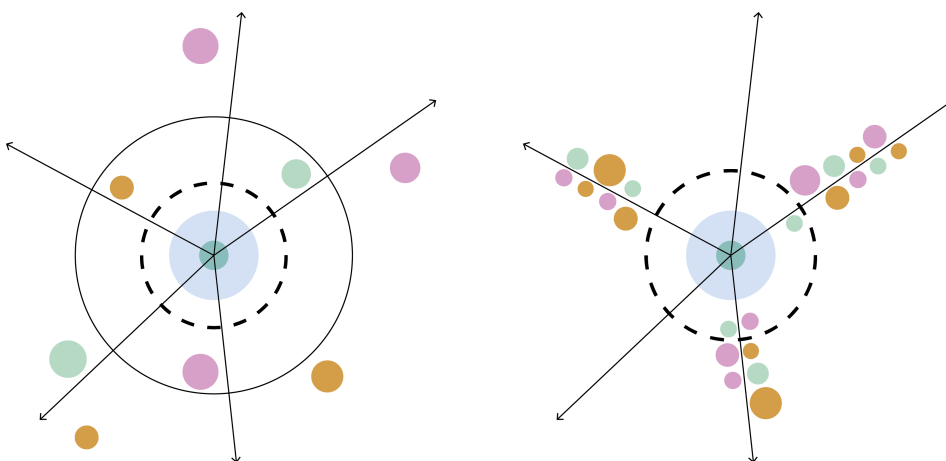


Figure 1 From Dispersed New Cities to the Linear System. Diagram by Author

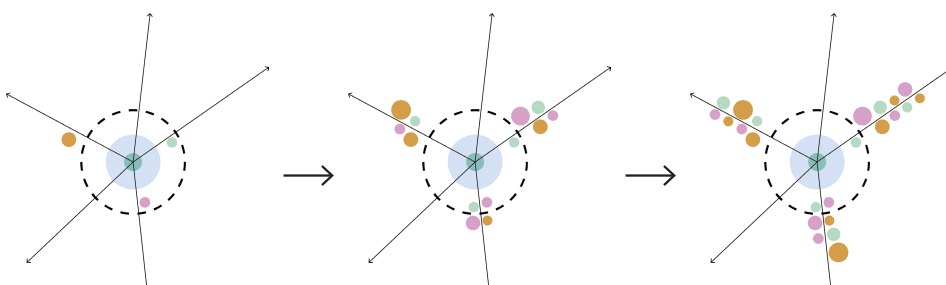


Figure 2 The Process of Building New Cities in the Linear System. Diagram by Author

THE EXISTING SYSTEM

The existing mono-centric system of the dispersed deserted cities around Cairo has shown its inefficiency in attracting residents and businesses to the new towns. The enormous resources invested over tens of years without proper outcomes can only show the system's failure. Furthermore, having a ring road connecting the dispersed desert cities with Cairo did not help connect the cities properly, as many cities are not directly connected to the ring road. As a result, transportation time between the desert towns and Cairo consumes a large portion of commuters' daily life, which slowed the rate of urbanisation of many desert towns.

THE NEW LINEAR SYSTEM

The proposed linear system (Achsen - Zentren Modell) of developing new cities capitalises on the notion of creating cities that are linearly connected to the existing town and guarantee direct and effective connectivity between the cities. That gives a chance for new towns to rely on existing cities till they reach a level of self-sufficiency. Moreover, by creating some connectivity corridors starting from the developed city, there is a big chance of having a set of new towns linked together through these corridors. This system overcomes the drawbacks of the existing mono-centric system, as less transportation infrastructure is needed and more connectivity between the city is created.

THE EVOLUTION OF THE SYSTEM

Development and growth are essential concepts in the linear system, as linearity helps the city evolve in a specific direction and guarantees connection to other towns. By having one or two linear corridors that pass on the side of each town, main transportation stations will start to take place on the city's boundary. Then, as the city grows over time, more stations can take place and connect the extension of the city to the rest of the regional system. In this way, the linear system sets a strategy in which towns can be linked effectively and have the opportunity to develop over time.

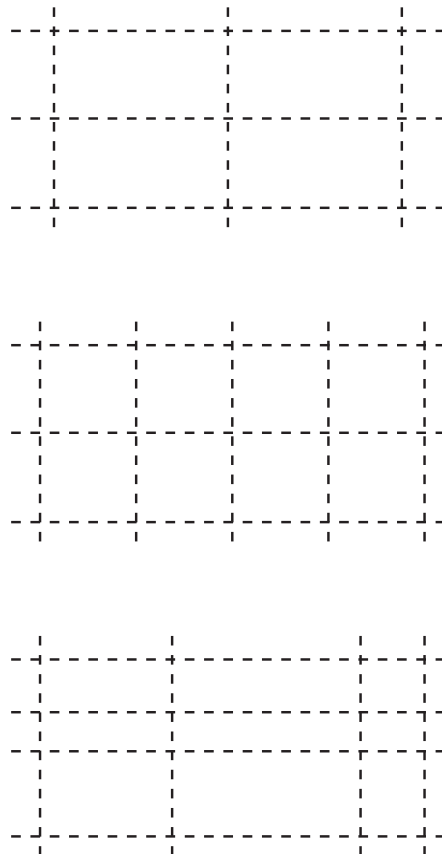
Through that system, new cities can rely on the existing cities on the corridor as they are well-linked. Over time, when cities develop, they can become self-sufficient and rely less on the neighbouring towns. Therefore, that system helps new cities to progress through phases and guarantees mobility and services through the neighbouring cities. Giving a chance for urban growth to happen through linear corridors, being well-connected and offering bottom-up initiatives, there is a chance to attract the growing Egyptian population to this urban environment.

2. TOWARDS A DEMOCRATIC URBAN PLANNING

The propositional methodology to plan new cities capitalises on bringing top-down and bottom-up planning together. The top-down system guarantees a system and an order, while the bottom-up initiatives bring human needs to reality. The proposed democratic urban planning is based on architectural and urban principles to guarantee a thriving urban environment.

2.1. THE GRID

The typology of the grid structure has proven to be one of the most efficient systems in urbanism. Found in different cities of various sizes and layouts, like Manhattan, Barcelona and Chandigarh. The grid system can create many possibilities for civilian life if the sizes of the blocks and roads are well planned. It should have different spaces for pedestrians, and the dimensions of the blocks are walkable distances. The proposed grid systems illustrate the possible scenarios of the grid system. The decision to choose a specific grid option should be made collectively to ensure a collective aim rather than creating new top-down unsuccessful cities. As the grid criteria are flexible and can take place in various forms, it allows a particular organisation and system to take place rather than having ambiguous outputs created by the existing deserted cities' Masterplans.



0 1 km

Figure 3 The Grid can take shape in various forms. Diagram by Author

2.2. THE STATION

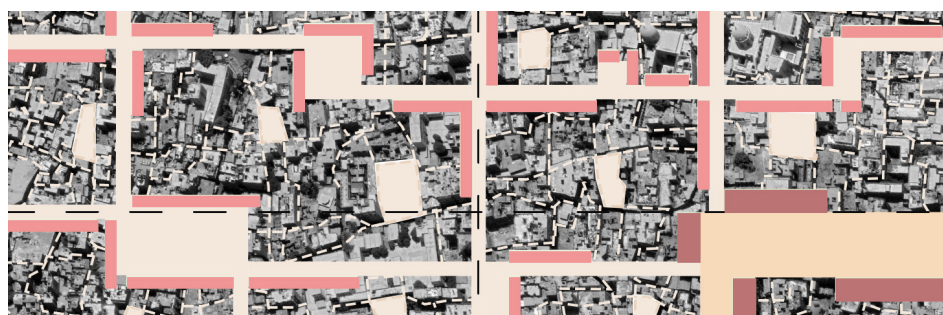
Train Stations and mobility are a must to ensure a quick urbanisation process. Stations can take place within the boundaries of the town. The linear system capitalises on flexibility and expansion, where cities can grow without any collision with the train network as more train stations can take place on the extension of the city. Furthermore, an open space in front of the station allows public activities. The station boosts the intensification of public activities and creates a qualitative exchange of services.

The area surrounding the station is the starting and ending point for the commuters, therefore has to act as an urbanisation catalyst for the realm. The realm around the station must capitalise on the idea of offering various service delivery programmes to densify and intensify the area. An open area directly attached to the station can become a usable public space to distribute the civilians and offer a spectrum of urban services.

Learning from the case studies in Cairo, the station can host several urban programmes and offer various service deliveries. Therefore, the station can expand its role to become a platform of possibilities for its surrounding area.

2.3. THE PEDESTRIAN NETWORK

The Pedestrian Network can connect the proposed city. Service hubs take place in the pedestrian network to activate the public realm. As shading is valuable in Egypt, palm trees are arranged as groups to create density and shade. By creating building hubs in pedestrian spaces that host various public programmes and having a sustainable landscape that assembles density, there is a high probability of creating a usable public realm for the users. The neighbourhood is the collective realm where various clusters are united. A shared High Street is significant for creating the opportunity for the inhabitants to interact and exchange different services and qualities. That is achieved by diverse urban artefacts like the "Souk", "Bazaar", dispersed malls and ground floor commercial programmes.



0 500 m

Figure 4 The Pedestrian Network. Collage by Author

The Pedestrian Network can take place vertically and horizontally to link the new urban environment. The size of the open spaces is referenced to some successful open spaces in Cairo (such as Ibn Tulun, Amr ibn el Aas, Sultan al-Muayaad, al-Ataba, Alhussein mosque courtyard and Al-Hakim Mosque courtyard). "formal" buildings secure and form the pedestrian network. These "formal" buildings built by the State or investors can become the starting point to house and create jobs for the new residents. The spectrum of these buildings should cover most of the necessary programmes inhabitants need in their neighbourhood, like educational programmes, sports programmes, healthcare programmes, libraries, museums, and religious buildings. In addition, there is a chance for those buildings to act as a catalyst for bringing different qualities to the community, ensuring that the majority of the residents would have direct access and well distribution of services, a feature missing in the deserted cities of Egypt.

2.4. THE "FORMAL" STRUCTURE

A set of "formal" buildings built by the State or investors creates a network of open spaces. These buildings help define and activate the pedestrian network through ground-floor services that bring pedestrian qualities. The "formal" architecture will also catalyse change in activating the city's new inhabitants/workers/businesses. That will attract people to the new urban environment; further bottom-up activities can occur according to the people's needs.

The distribution of communal buildings throughout the neighbourhood is essential to reach the maximum connection between the inhabitants. Mosques, churches, schools, nurseries, libraries, collective spaces, museums, hospitals and leisure buildings are all programmes that can take place in the "formal Buildings". These building programmes are fundamental in the realm of the neighbourhood to avoid creating new mono-functional deserted cities.

Learning from Egypt's deserted cities for having a well-designed urban environment that meets the needs of all inhabitants, it is critical not to have mono-functional programmes and a diversity of functions and activities. Instead, it is essential to create service-delivery programmes and rich mixed-use activities in the realm of the pedestrian network.

The "formal Buildings" need to capitalise on missing architectural artefacts in the existing deserted cities to generate better outcomes in the new desert cities.

1. The permeability of the ground floor: The ground floor plays a critical role in activating the public realm and offering services and programmes the citizens need.
2. Flexibility of the floorplan: Flexibility in architecture is needed to serve a broad spectrum of people. Also, people need architectural flexibility to modify their space according to their needs.
3. A spectrum of Typologies: As people are not all similar and have different living styles, creating a spectrum of different architectural typologies is needed to attract different family sizes and groups.

4. Mixed-use and no monofunctional architecture: This is a significant factor in "informal" Cairo and was completely neglected in the existing deserted cities. People need mixed-use architecture and neighbourhoods to fulfil their needs within a short time and compact walking distance.

5. Communal spaces: This quality of space is needed in architecture and urban space to boost integration between the residents and create a homogeneous relationship between people.

2.5. THE SECTOR

The Sector is the outcome of the possible grid system. It can host residential, commercial and mixed-use functions the people need. The size of each Sector can be flexible, depending on the outcome of the democratic decision-making mechanism. However, the Sector's services should be within a radius of 5-10 minutes of walking. In addition, the greenery of the Main Pedestrian Network can delve into each Sector to bring accessibility to nature and connectivity to the entire city.

The Sector needs to address some critical principles neglected in the existing deserted cities to guarantee urban success.

1. Density: In the harsh desert climate in Egypt, shade is not a luxury. It is needed to elevate the quality of urban activities through the daytime. Therefore, density in architecture is essential in generating shade needed for indoor architecture spaces and the public realm.

2. Short walking distance to services: This ensures better urban resilience in the neighbourhood and the Sector. Services have to be accessed within short walking distances. That was precarious in the existing deserted cities as residents had to walk long distances in the sun to access their daily services.

3. Urban diversity: Different plots' sizes and programmes guarantee a spectrum of services and typologies. That is important not to recreate a monofunctional urban environment and boost an active neighbourhood and public realm.

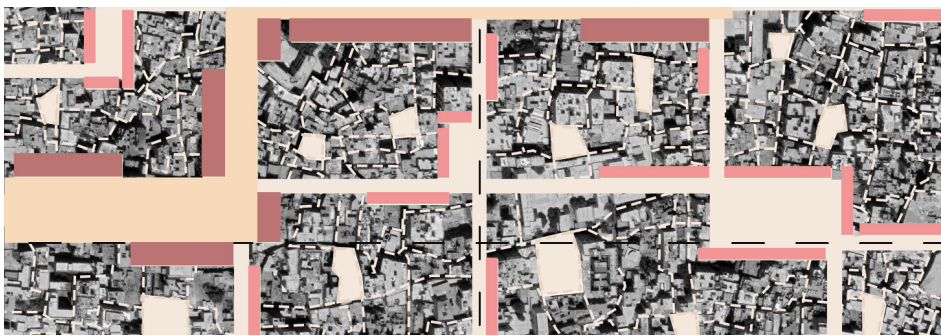


0 500 m

Figure 5 The Sector. Collage by Author

2.6. THE BOTTOM-UP CITY

As the "formal" buildings form the open spaces and create a pedestrian structure for the city, the rest of the city capitalises on the idea of giving a platform of opportunities for bottom-up activities to take place. The State built technical infrastructure to efficiently help residents build housing units, offices, workshops and commercial programmes. As people in Egypt tend to build "informally", they can achieve their needs effectively. That methodology allows people to construct their town, which creates a high chance of fulfilling an urban environment that meets everyone's needs.



0 500 m

Figure 6 The "formal" and "informal" juxtaposition, a collage of "informal" settlements in Cairo and the propositional city. Collage by Author



0 500 m

Figure 7 The "formal" and "informal" juxtaposition, a collage of "informal" settlements in Cairo and the propositional city. Collage by Author

Through the "informal" case studies in Cairo, the bottom-up initiatives helped solve many urban problems for Egyptians. Although "informality" in Cairo could be criticised for safety and hygiene issues, it has created affordable housing units for over ten million inhabitants in Cairo. By understanding the importance and potential of "informality" in the urban realm, it is critical to recognise how to help residents generate safer and more resilient bottom-up architecture.

The "informal" Sector in Egypt created different housing units juxtaposed by diverse working activities, leisure programmes and sometimes sustainable and recyclable activities. So how could the bottom-up initiatives play a role in influencing the micro-scale in new desert cities?

It is necessary to comprehend that it is a collective process that needs various factors to perform. In this case, the State and the investors need to help residents accomplish this aim. Investing in built infrastructure, creating "formal" buildings in the early steps of building the city to host various programmes to boost the urbanisation of the town and giving space for "informal" architecture to take place might attract a large number of people to move to the new cities as they have a better chance to achieve their desired living environment. Residents, in this case, can collectively choose their dwellings typology and collectively build it together with the help offered by the State.

A collaboration process between architectural offices and individuals is fundamental to reaching better results. For example, although people in Cairo know about building their own space, collaboration with architects would elevate the quality of space and the built environment. In this case, the urban and architectural outcome results from State, architects and bottom-up initiatives aiming to create a better physical environment.

The hypothetical illustration below represents possible scenarios that can take place where the "formal" buildings highlight the pedestrian streets, leaving the superblock for bottom-up speculations. In this case, the illustration of the bottom-up architecture is taken from the "informal" Sector in Cairo to illustrate how it could juxtapose with the "formal" architecture. Bottom-up initiatives can collectively create streets and open spaces, then collectively build dwellings and services and create job opportunities.

2.7.THE RIGHT TO OWNERSHIP

The right to ownership must be legalised in this process to protect the efforts and rights of the bottom-up construction. The State must work hand in hand with the urban planners to create a formula that protects people's ownership rights to guarantee a civilian urban process. As people will invest many resources, time, energy and emotions in building their space, laws and regulations have to support space ownership. That is a complex theme, and one must delve deeply into this topic to propose wise legislation propositions. Although this research is not focusing on this topic, it was critical to mention its importance and the need to optimise it to deliver successful urban outcomes.

2.8. JOBS OPPORTUNITIES

The absence of that notion was one of the main reasons for the low success rates in Cairo's desert cities. Creating job opportunities is fundamental to attracting residents to the new urban environment. Jobs here are targeted as "formal" and "informal" jobs, whereas the "formal" buildings aim at creating jobs in the interest of the State and the investors. While the "informal" architecture generates bottom-up jobs that people need.

2.9. THE NEW MOBILITY

Cairo has experienced lots of bottom-up transportation models that have proved to be successful and supported the transportation dimension of Cairo from not collapsing. Bottom-up urbanism in transport can also happen in the new desert cities, allowing different bottom-up typologies of transportation to thrive and help have a better-connected new urban environment. Also, that creates a possibility for creating job opportunities for a large sector of the new residents.

The New Mobility proposition tries to allow different mobility speeds to take place in the urban environment while capitalising on the potential of bottom-up initiatives. To do that but relate to nowadays technologies and challenges, one must think of sustainable ways to create different speeds of mobility throughout the superblock, neighbourhood and the city.

1. Level one of mobility: is the walkable distances in the realm of the superblock and the neighbourhood, strengthened by the dominance of pedestrians, bicycles and other slow mobile vehicles.
2. Level two: focuses on the bicycle lanes and electrical "tuk-tuk", which serve as a transportation service for short distances.
3. Level three: covers vehicle mobility, from cars to buses, utilising the new residents of the neighbourhoods. Electrical public buses could be a possible and flexible transportation mood for the new inhabitants. Since it is economically challenging to create over-ground/ underground metro lines with the same density as developed countries like in Europe, the electrical public busses could serve as a bridging mobility service from the new train stations to neighbourhoods.
4. Level four: is mainly covering a faster speed of transportation. The overground metro lines in the propositional city can cover long distances in a relatively short time, thanks to the railway system that achieves that goal. Planners should invest more in sustainable public transportation systems and encourage more people to use them rather than supporting the notion of car ownership and having more cars, traffic jams and air pollution.
5. Level Five: is the faster level of mobility, where high-speed trains achieve that aim. In addition, highways between the cities will exist to allow individuals to move freely using their vehicles. Nevertheless, if the public transportation system is well-planned and relatively cheaper than other forms of transportation, more users will tend to use it. Thus, one can achieve a sustainable mobility system and bypass Egypt's many drawbacks.

2.10. BUILDING CITIES IS AN ONGOING PROCESS

Building cities is an ongoing process that probably never ends. The planning doctrine of the deserted cities around Cairo was the opposite. However, of course, this never worked. To not repeat this mistake, the propositional town must be constructed in phases, where new stages of the city need to overcome some of the problems of the older ones to achieve better results for the urban environment.

The first phase can focus on building the "formal" buildings close to the main train stations, where they highlight the Pedestrian Network between the stations. New residents can benefit from the "formal" architecture as they host services, generate job opportunities and host temporary residential units until residents build their own "informal" neighbourhood. By allowing top-down and bottom-up approaches to take place, there is a chance of creating a system that achieves residents' needs and has a structure that makes the city grow systematically.

The illustrations are only hypothetical; the cities will look differently depending on the bottom-up activities and the process of learning from the earlier stages. It is fundamental to represent how the top-down and bottom-up initiatives could form an urban environment collectively and achieve better results for the majority.

The "formal" buildings show the logic of defining the open spaces and main networks while hosting various programmes and service deliveries. At the same time, like in Cairo, the "informal" initiatives create their logic of the urban environment with streets, open spaces, dwellings, services and job opportunities. This city is a product of various actions, stakeholders and decision-makers that work together to achieve an urban environment that meets a spectrum of residents' needs.

2.11. A NEW FINANCIAL MODEL

As most of the built desert cities around Cairo were mainly built by the State and mainly financed through taxpayers, the processes of accountability and efficiency were unsuccessful. On the other hand, the financial model of the fourth-generation cities was based on selling plots to investors and investing this money in building technical infrastructure and social housing.

By shifting the role of the State to only a managerial role, the State can have better control over the process of urbanisation and less risk of inefficiently using the taxpayer's money. That can be created by generating a collective mission statement that ensures the benefit of the majority. A spectrum of people, architects, city planners, the State and investors can all work together to generate this mission statement. Therefore, the private sector can become the urbanisation catalyst, and the State can ensure that they follow the democratic collective mission statement.

HOW TO SUPPORT RESIDENT IN BUILDING RESILIENT BOTTOM-UP ARCHITECTURE?

I. FINANCIAL SUPPORT

By facilitating financial credits, loans and mortgages, more people will be able to construct their bottom-up architecture. Although "informal" buildings in Cairo are built without bank loans (as they are not allowed to take loans), they achieve low standards of architecture and modest material qualities. By introducing financial support to people, there is a higher chance of generating better quality architecture and more sustainable buildings.

II. UPDATING BUILDING LAWS

Building "informally" is not allowed in Egypt. The construction laws became stricter in 2017. "We are not going to chase slums forever, this should end".² The State needs to change its perspective on "informal" construction. If managed and built correctly, it can remove a lot of responsibility and resources from the State. Also, it can be an effective mechanism to speed up the construction rate to cover the gap between the growing Egyptian population and the housing market.

III. CHANGING THE BUILDING METHODS

Almost all "informal" settlements in Cairo are built with reinforced concrete and brick walls, as they are Egypt's most common and available building materials. However, they are not sustainable as concrete production produces a lot of carbon dioxide, and bricks are produced by vegetation soil which is scarce in Egypt. Therefore, new top-down solutions from the State and the private sector need to be found to build sustainably and facilitate bottom-up construction. Notions like prefabricated elements and buildings with rammed earth could replace the conventional concrete building method and speed up the building process.

REFLECTION

1. THE LINEAR SYSTEM

The proposed linear system of building new cities overcomes the drawbacks of the current mono-centric system of urban growth. The mono-centrality proved inefficient in attracting residents and services while costing many resources.

The linear connection between the new and existing cities allows cities to grow faster, thanks to its effective connection. The linear corridors give a better chance for new cities to take place and grow as they can rely on the existing cities, offering the missing services and programmes.

2. THE JUXTAPOSITION OF TOP-DOWN AND BOTTOM-UP PLANNING

By having complete flexibility and room for the public to influence the micro-scale in the new desert cities, it is critical not to fall into the trap of creating another complete "informality" and suffer from its drawbacks. In creating a framework where the State, urbanists and the public can all create a design brief that regulates the formation of the city, there is a high chance of not creating new deserted cities that fail to attract people. By doing so, citizens would introduce new typologies, ideas and prototypes into the planning of the new towns, which could help create a scenario where the State can help individuals build/modify their domestic space.

3. THE PROCESS OF BOTTOM-UP URBANISM

As over 10 million people live in "informal" settlements in Cairo, there is an acquired knowledge of bottom-up designing and building architecture among Egyptians. These "informal" areas have achieved a spectrum of qualities to meet the residents' needs and showed their resilience to many economic and social challenges. By capitalising on bottom-up urbanism, the State can save many resources on building top-down deserted neighbourhoods, where people can carefully construct their urban/architectural space according to their needs with some State help. By doing that, the State assures that the new desert cities will not be ghosted as the previous ones and that people will quickly house the urban environment.

The process of bottom-up urbanism needs to keep learning from the earlier stages of the process to achieve better outcomes. People can collectively create their neighbourhoods, streets, open spaces, dwellings and services to meet their needs. Also, this generates a sense of community and belonging among the residents.

Finally, the new city will be an outcome of the top-down and bottom-up design and decision-making processes, aiming at overcoming the mistakes of the existing deserted towns and creating a healthy urban environment that meets the needs of the majority of society.

LEARNING FROM THE 10 PRINCIPLES FROM TO BUILD A NEW CITY IN AFRICA BY RACHEL KEETON & MICHELLE PROVOOST

1. PLANNING IS AN ONGOING PROCESS

The idea of having a finalised Masterplan is not recommended in the urban planning proposition due to its inflexibility and long-term problems, as illustrated in the existing desert cities. The proposal's core is that design should not be a one-finished scenario but an ongoing development process between different stakeholders, where people can bring their ideas and influences through time.

2. PLAN FOR ADAPTIVITY

Adaptivity and flexibility were two fundamental notions in the proposition. The top-down urban design capitalises on allowing spaces to be flexible and allowing the urban environment to constantly adapt to the users' needs.

3. NO NEW TOWN IS AN ISLAND

The Linear mobility model in the proposal connects the new cities through the linear system, allowing easy access between different cities. In that case, new towns are connected with other developed cities to rely on their services in their early years. Therefore, the model created treats the cities as a whole system rather than the sum of parts.

4. USE NO CUT AND PASTE UNIVERSAL MODEL

The propositional model is tailored to the Egyptian desert climate, where density plays an essential role in urban fabric formation. The idea of having flexibility and a chance for bottom-up activities to take is critical to guarantee an Egyptian urban model rather than a universal cut-and-paste model.

5. EMBRACE NEW IDEAS

Embracing new ideas is mainly boosted through "informality" in this proposition, where "informality" can bring new thoughts and creative ideas to the urban realm, with a degree of achieving users' needs.

6. INFRASTRUCTURE AND MOBILITY FOR ALL, FROM THE START

The starting point of the process of urban development in the proposition was linear mobility and its ability to mobilise people efficiently to different desert cities. Also, mobility inside the city plays a critical role in connecting the neighbourhoods. Bringing "informality" to the new urban environments can only be achieved through an effectively affordable transportation system that mobilises most people to the new desert cities.

7. USE A BLUE-GREEN INFRASTRUCTURE AS THE CENTRAL FRAMEWORK

The proposed Pedestrian Networks connect the city. It uses the blue-green infrastructure as the central framework to distribute the urban fabric. Secondary Pedestrian access starts from the Main Pedestrian access to create a network of pedestrian accesses throughout the city.

8. INCORPORATE LOCAL CULTURAL HERITAGE(S)

Local culture and local heritages are boosted through the presence of "informality" and bottom-up initiatives in creating the physical environment. The urban environments must relate to the local needs, culture and heritage to deliver a sense of connection between the users and the urban space.

9. COMBINE TOP-DOWN AND BOTTOM-UP

The core strategy of the proposition is to juxtapose the bottom-up and top-down initiatives in the decision-making process and to build the city. Both systems have their advantages. If combined wisely, they can deliver better urban results.

10. NEW TOWNS NEED DIVERSITY

Diversity is dominant in the proposition, thanks to areas allocated for bottom-up initiatives to happen. Bottom-up activities create a platform of possibilities for diversity to occur while responding to the needs of people.

1 Minihane, J. (2022, February 9). The world's most fascinating abandoned towns and cities. CNN. Retrieved June 16, 2022, from <https://edition.cnn.com/travel/article/most-fascinating-abandoned-towns/index.html>

2 Residents of illegal buildings are seen outside their poorly structured rooms at the Qalubiya town of Kaha, about 50 kilometers (30 miles) north of C. J. 16, Agence France-Presse | AFP | May 13, 2022, & Shatha Yaish | AFP | May 13, 2022. (n.d.). Egypt imposes strict measures on illegal construction. Al. Retrieved May 13, 2022, from <https://www.al-monitor.com/originals/2020/05/egypt-illegal-construction-slums-emergency-law.html>

SUMMARY

As the global population is exponentially increasing and the rate of migration to urban areas is high, investing in urban environments will remain an active topic for the coming years in many developing and developed countries. Investments in urbanism have taken place for some decades in several parts of the world also in several forms, yet, the outcome of many of these developments is unsuccessful and sometimes embarrassing.

In this research, Egypt is a pilot case study of a country that invested massive resources, time and energy in building new cities to house the growing population and the high exodus rate from rural areas to cities. The research focuses on understanding the desert cities around Cairo, where many of these cities remain deserted or at least partially vacant due to various reasons. The dissertation highlights the fundamental factors behind this low-success rate and proposes multiscale propositions to solve the epidemic problem of deserted cities in Greater Cairo. These propositions aim to spread over many deserted towns that share similar symptoms to Greater Cairo's deserted cities.

As investigated, four dimensions influence the success of the cities, the physical dimension, the political dimension, the social dimension and the financial dimension. The four dimensions have a direct and indirect influence on each other. Ignoring one of them in the planning and decision-making process creates defects in the short and long term of the urban environment.

In Greater Cairo's desert cities, the imprudent physical environment planning made many desert cities unattractive. Unwise location and precarious transportation models are the main reasons for not triggering a new population. The outdated urban design concepts, Mono-functionality of the neighbourhoods, very low density of the urban block, unusable public space, absence of urban services and highway typology streets are all urban planning defects that created precarious urban conditions.

The unwise model of the economic dimension also played a critical role in the low success rate of desert cities. Some desert cities were expensive to build due to their unwise location, creating dwellings that were way above the Egyptians' finances. The economic conditions made the desert cities for most Egyptians unattractive and inaccessible. Under the new regulations from the current political leadership, mortgages and finances made the process of owning or renting way more accessible than before.

Ignoring many aspects of the social dimension also made the desert cities less attractive for most people. For example, a spectrum of job opportunities is critical to attracting new inhabitants, which was not the case with many desert cities. In addition, the absence of essential social services like educational, healthcare, cultural, and sports institutions made the desert cities' social dimension precarious.

The ignorance of the political leadership (until 2011) cost the country enormous resources. The political dimension probably plays the most influential role in making cities successful by making prudent democratic decisions that benefit most of society. Unfortunately, this was not the case in the last years, as urban projects were mainly developed as political shows to advertise the achievements of political leadership.

Also, corruption, lack of accountability and absence of a sustainable decision-making system were all aspects that made the political dimension ineffective in triggering urbanity in the desert cities.

By analysing the urban context in Greater Cairo, it is evident that mobility plays a dramatic role in bringing life to new urban environments. By capitalising on the importance of mobility and the typology of the station, they deliver a spectrum of qualities to deserted cities, and other forms of urbanity will start to take place. In this case, the station is the "Trojan Horse" to bring "informality". "Informality" is then the catalyst of change, and the public would find ways to make the deserted cities more urban. Therefore, it is critical to understand the potential of the "informal" initiatives and how they could bring diverse qualities to the metropolitan area without falling into the trap of romanticising the "informal". By testing these scenarios in some locations and critically observing the consequences of these decisions and how people will react to them, we can learn from the first scenarios and continue to develop urban notions to suit the users of the urban environment better.

Finally, as population growth continues to increase in many parts of the world, it is critical to propose better means of planning the new urban environment. After understanding the reasoning behind the failure of the desert cities around Cairo, the process of planning and building new urban environments should happen differently. The conventional idea of top-down planning has proven its inefficiency in many cases, where the scale of the drawing board does not relate to the human scale. The propositional urban planning strategy of building new cities allows juxtaposing top-down and bottom-up planning processes. The top-down delivers better strategic planning, while the bottom-up guarantees a better logic for creating the urban environment from the users' needs. To reach better results and not repeat past mistakes, it is critical to test the earlier stages of these concepts, analyse them and investigate the users' feedback to continue developing better urban environments.

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