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URBAN TRANSFORMATION OF INFORMAL SETTLEMENTS IN TURKEY AND EGYPT

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ABSTRACT

Developing sustainable cities is an essential issue in order to solve problems caused by rapid growth of urban populations. The main research problem is that sustainable urbanism is not considered in strategies of developing informal settlements in Egypt. The state does not have integrated strategy to solve the problem of informal settlements expansion. The paper aims to highlight guidelines for development processes and urban transformation of informal settlements. Characteristics of eco-cities are presented. Urban transformation project of old informal settlement in Turkey, Zeytinburnu, is discussed showing how some sustainable principles were considered. Efforts exerted in Egypt to mitigate harmful effects of informal settlements are not effective. The majority of public housing projects in new cities are abandoned and informal settlements are still expanding. The case of Imbaba Airport district is presented as a large ongoing development project. Comparative analysis between Zeytinburnu transformation project and Imbaba Airport project is presented. Despite the drawbacks of informal areas, they have certain features that encourage further expansions. Highlighting those features would help in identifying requirements that should be fulfilled during development processes. Main guidelines for urban transformation projects in informal settlements are presented taking into consideration sustainability while planning to transform them into eco-cities.

KEYWORDS
Informal settlements, urban expansion, sustainable cities, new towns

1. INTRODUCTION

The paper aims to find out guidelines for the urban transformation of the informal settlements. The methodology adopted is a literature review of the definitions and principles of sustainable or eco-cities and then a discourse analysis of the Urban Transformation Project of an old squatter housing in Turkey, called Zeytinburnu, showing how sustainability of urban renewal was provided while planning. Then, exploring the development strategies and processes that Egypt took to solve the problem

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of informal settlements show how sustainable aspects were not taken into consideration. This is achieved by highlighting the drawbacks of the New Cities and reasons of expansion of informal settlements in Egypt. Imbaba Airport area in Giza is taken as a case study, analyzing its development process.

The paper is composed of seven parts. The first part explores the definitions and principles of eco-cities. Part two shows the development process of an urban transformation project in Zeytinburnu in Turkey. Part three discusses the informal settlements in Greater Cairo Region. Part four examines the development strategies in Egypt to solve the phenomenon of informal settlements. Drawbacks of the public housing in the New Cities are highlighted. Reasons of the continuous expansion of the informal settlements are discussed. Part five analyzes Imbaba Airport area development. Part six presents guidelines for urban transformation projects in informal settlements taking into consideration sustainability while planning to transform them into eco-cities. Part seven presents a comparative analysis of the two projects in Zeytinburnu and Cairo.

2. PART ONE: PRINCIPLES AND DEFINITION OF SUSTAINABLE CITIES

Countries developed ‘eco-cities’ in order to solve problems caused by the rapid growth of urban population: housing shortages, deterioration of living conditions, growing pollution problems, increasing automobile traffic, and disappearing green space. In response to serious pollution of the atmosphere, rivers, lakes, and seas, the central theme of eco-cities was to restore the blue skies and clean waters and soil. To plan and build cities more sustainably, efficiently and livable without damaging the ecological surroundings have been a focus of designers and architects for many years. During the last century, the concept of “garden city” or “green city” was promoted comprising planned and self-contained communities surrounded by green belts and balanced areas of residences, industry and agriculture [1]. The eco-city can be traced to the mid-1970s when Register and his colleagues in Berkeley found “Urban Ecology” to rebuild cities in balance with nature [2]. The eco-city addresses the importance of compact urban structure and other city planning approaches in saving energy and

resources [3]. It encourages more density at closer proximity, because when the distance between destinations goes up, so does energy use, waste and land-use. Initially, the objectives of the eco-city were simply to make air, water and soil clean again. Specifically through the following ten principles, they wish to create ecological cities:

1. Revise land-use priorities to create compact, diverse, green, safe, pleasant mixed-use communities near transit nodes and other transportation facilities.
2. Revise transportation priorities to favor foot, bicycle, cart and transit over autos and to emphasize "access by proximity".
3. Restore damaged urban environments, e.g. streams, shorelines, and wetland.
4. Create decent, affordable, safe, convenient and economically mixed housing.
5. Nurture social justice and create improved opportunities for disabled.
6. Support local agriculture, urban greening projects and community gardening.
7. Promote recycling, innovative appropriate technology, and resource conservation while reducing pollution and hazardous wastes.
8. Support ecologically sound economic activity while discouraging pollution, waste, and the use and production of hazardous wastes.
9. Promote voluntary simplicity and discourage excessive consumption of material.
10. Increase awareness of local environment through activist and educational projects that increase public awareness of ecological sustainability issues.

The meaning of eco-city has changed coupled with expanding size of environmental issues. Today it is common to use both sustainable city and eco-city to mean virtually the same thing [4]. The trend in eco-city design began to incorporate greenery, nature, resource, and energy efficient use, all in an integrated way. During the 1980s the term 'ecopolis' came into use in Germany. It emphasized nature in the form of urban green zones, and also encouraged the use of natural energy sources such as solar and wind powered electricity generation and proactive approaches to environmentally friendly activities such as resource recycling. An important aspect of ecopolis design is the emphasis on the uniqueness of each city. In Japan, after the serious environmental problems were resolved, the concept of 'amenity town' appeared where urban scenery, comfort, leisure, and relaxation were emphasized [5].

The main objective of urban sustainability is to improve the quality of life by providing affordable housing and employment opportunities. It also aims to provide quality of life through open space and green space, and it could include cultural, leisure and recreational resources. “Urban sustainability” is a place-dependent concept: what is desirable and sustainable in one city may not be the case in another.

A definition of sustainable cities is being used by UN HBITAT in its report “State of the World’s Cities 2008/2009”: Harmonious Cities which makes a clear statement about the high standards and qualities of such a city: “Cities are not just bricks and mortar: they symbolize the dreams, aspirations and hopes of societies. The management of a city’s human, social, cultural and intellectual assets is, therefore, as important for harmonious urban development as the management of a city’s physical assets is. Urban planning has to go beyond being just a technical experience to one that is interested in a city’s various tangible and intangible assets’’ [6]. In this respect main issues that should be considered in eco-cities are: energy sources, municipal solid waste management, water supply and drainage, green areas, traffic and transport.

2.1 Energy Sources:

Buildings are the most basic element of energy consumption in cities. The greatest potential for energy savings in sustainable cities lies in green buildings [7]. Effective actions include enforcement for new constructions using integration of design with multiple energy efficiency programs in response to local climatic conditions and technical capabilities, the use of led lamps and compact fluorescent light bulbs as well as mounting solar electric generators on rooftops. Together with energy efficiency and decentralized energy systems, renewable resources such as wind turbines, solar photovoltaic panels, and solar thermal connectors supply considerable amount of energy.

2.2 Municipal Solid Waste Management:

Today, conventional waste disposal is not a sustainable option, since it cannot deal with the piles of waste created every day in cities. By utilizing circular systems, waste is seen as a resource to be reused. Eco-cities have to be created with a more circular view on

waste by creating sustainable solid waste systems. Waste recycling makes an important contribution to reducing energy usage and pollution as well as minimizing landfill and burning waste.

2.3 Water Supply and Drainage:

Water is the element of life, and is the fundamental source for sustainable integrated development. Arid regions suffer from water shortage; consequently water demand and use should be managed wisely in a sustainable way. Eco-cities use water efficiently applying recycling techniques. Municipal drainage water is suitable for irrigation purposes. It could be easily treated and reused by separating gray water and black water. Small water treatment plants are constructed to produce suitable water and fertilizers for greening the local area.

2.4 Green Areas and Urban Agriculture:

Green areas, urban agriculture and farmlands included within metropolitan areas should be preserved. These farms are productive and also invaluable in many other ways. They include production of fresh food and vegetables, reduction in transportation load and enrichment of environmental quality. Green areas absorb huge amounts of GHGs and thus slow down global warming. They are lungs of the city as they provide a healthy environment. More trees should be planted in the city to purify the atmosphere, provide shade, cool the city, support biodiversity and prevent the formation of urban heat island.

2.5 Traffic and Transport:

"Cities are shaped by transport and hence sustainable transport – good transit – walk ability and cycling facilities should help shape sustainable cities" [8]. During the last few decades there has been a rapid growth in transport of people and goods along with the number of motorized road vehicles. This growth has several unintended consequences. Current trends pose sever challenges for societies aiming at moving towards eco-city development. If the capacity and quality of public transportation system is inadequate,

then the use of private cars will be the alternative. The individual motor-based transport is not sustainable. Mobile emissions are one of the major sources of air pollution. Moreover, private cars create a major problem of traffic congestion.

3. PART TWO: URBAN TRANSFORMATION OF INFORMAL SETTLEMENT IN TURKEY

The Zeytinburnu District is located at the Western side of the province of Istanbul, at the North of Marmara Sea, covering a total area of 1142 hectares as shown in Fig. 1, which is directly connected to a main highway and the Bosphorous Bridge. In 1957, it became a municipality as a district of Istanbul. The population density in Zeytinburnu in year 2000 was 20,639 persons per square kilometers, being one of the most densely district in Istanbul [9].

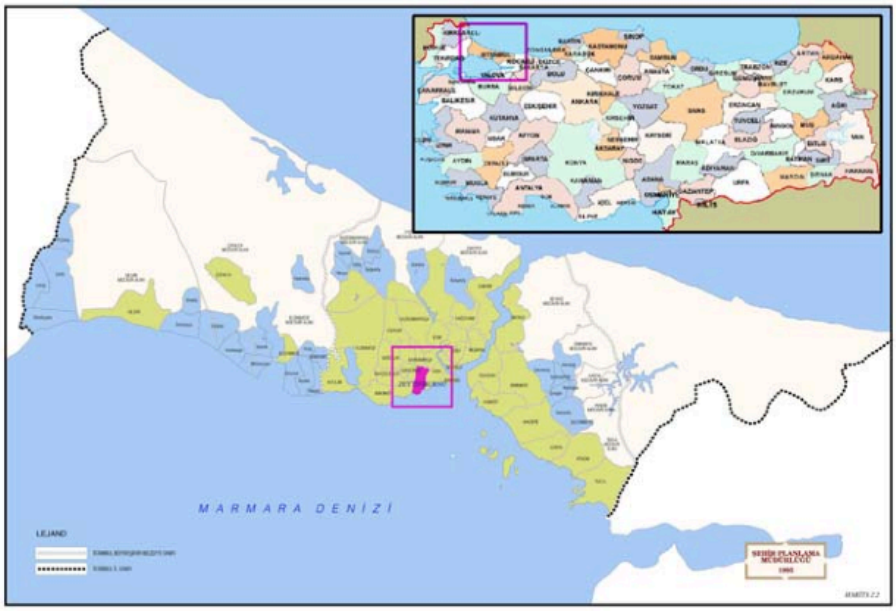

Fig.1 Location of Zeytinburnu District [9]

The history of Zeytinburnu is very rich as it was used as a walking promenade and a recreational place in the fifth century. During the years following the conquest of Istanbul by Turks in 1453, the oldest settlement known in the area was around Kazicesme. A community called 'Priests from Jerusalem' settled in Zeytinburnu in

Kazicesme. It became a pleasant neighborhood with agricultural products, olives and various fruits, grown by them.

Decision of Istanbul Municipality to include Zeytinburnu among areas allocated for industrial areas changed the fate of the district. Industrial facilities were rapidly built in the area [10]. The character of Zeytinburnu changed when a large wave of immigrants from Anatolia came and settled there from 1950 on. Zeytinburnu is an important lesson for city planning in Turkey, because it was one of the first districts whose most of its buildings were built illegally, without infrastructure and without any aesthetical concern. At first there were little brick-built single storey cottages. From the 1970, onward, they were replaced by mutli-storey concrete apartment blocks built in rows with no space in between. In most cases, the ground floor was used as a small textile workshop, and Zeytinburnu became a hustling industrial area with a large residential population living above the workshop. All this was still illegal and unplanned and still lacked the infrastructure and the aesthetics [11].

Zeytinburnu is chosen as a case study because it was the most risky in its urban pattern with very little green and over-built quarters. Moreover, it was the first squatter housing area, which later became a squatter town within the city of Istanbul. Figure 2 shows the current existing condition of Zeytinburnu [12].

Urban problems related to the illegal urbanization process lead to negative impact in urban spaces. The existing systems that direct urban development do not solve the contemporary problems. The urban regeneration projects have problems in integrating with each other and the rest of the city as they lack the holistic planning approach [13].

To fulfill the need for an urban plan of Istanbul, Greater Istanbul Metropolitan Municipality Planning and Urban Design Center prepared Zeytinburnu Urban Regeneration Project in 2006. The project aims to create high standard, livable, sustainable, innovative, lively and aesthetic urban spaces as an alternative to problems of unplanned development. The project includes the following activities: a design model has been developed with an approach of transforming existing building fabric into contemporary settlement, work has been carried out on a block-based structure and an urban design project and an architectural preliminary project have been developed for a

selected pilot area. In the Urban Design Project Areas Schema, a commercial axis that goes across the center is proposed in order to create spaces, which will trigger urban regeneration and enable social activity. Figure 3 shows the urban spine, which is considered a major pedestrian route where heavy building activity is planned around it. The creation of block-based structures with short, medium and long-term uses and spaces are planned in design zones identified along this axis. The design model enables three main issues: the integration of economic, social and spatial relationships, the creation of new identity for Zeytinburnu, and the development of the super-block system. This system comprises a hierarchical green system, semi-public green areas, playground, underground parking in courtyards and mixed-use building blocks where housing, offices, public facilities are mixed in one building.

Fig. 2 Existing Condition of Zeytinburnu[12]

Fig. 3 Urban Design Project Areas Schema, Green System and Center Relationship [13]

To guide the development of the District, important studies have been undertaken within the framework of spatial development strategies:

- Green systems and center relationship: Integrating the potentials of green areas and the relationship with coast is essential to enhance the urban life. Public facility areas, together with central and commercial relationships, which guide urban life, have been added to the scheme and a new public transportation system has been proposed.

- The super-block system: areas, which have the highest number of buildings with earthquake damage risk, have been identified. Super-blocks have been created by assembling the existing building blocks in selected areas. Architectural designs for earthquake-resistant buildings which open to gathering places have been prepared for newly established super-blocks as shown in Fig. 4 [13].

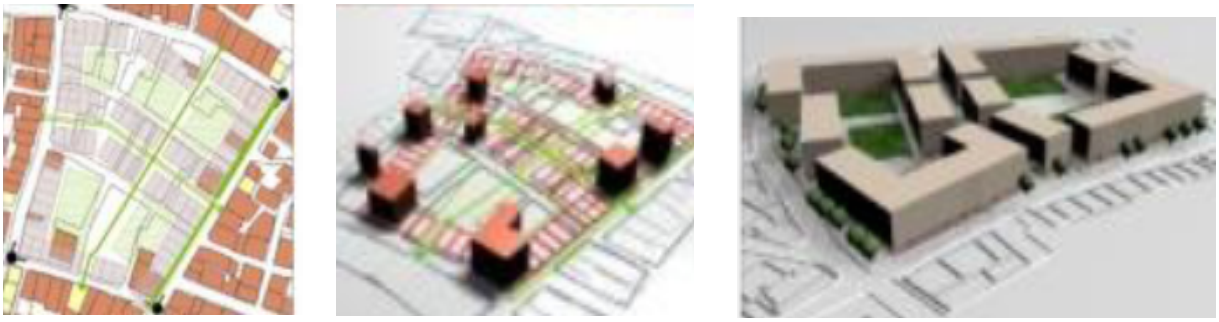

Fig. 4 The Super-Block Schema [13]

4. PART THREE: INFORMAL SETTLEMENTS IN GREATER CAIRO REGION

In the last few years different studies and projects have been carried out tackling the problem of urban development in Egypt and Greater Cairo Region. A report entitled “The Strategic Urban Development of Greater Cairo Region” is an important base for thinking beyond traditional approaches for Urban Development [14].

Due to massive population pressure, city officials in the 1950s began developing land further outside Cairo in areas such as Nasr City. However, the failure of the Egyptian government’s housing policy to provide affordable, feasible housing for a large number of Cairenes has led many to build homes, either semi-legally or illegally, on privately-owned or public lands. All privately built housing units available on the market are unaffordable to the large majority of Cairo’s households. Approximately 70% of the inhabitants of Greater Cairo are now living in informal settlements [15].

The best definition of informal areas in Cairo is that they are the result of illegal urban development processes that first appeared around 1950. They show a complete lack of urban planning or building control [16]. The origin of the urban informalization process was when Cairo witnessed the emergence of a peripheral form of urbanization.

Migration from Upper Egypt and Delta caused housing pressure to become critical [17]. According to the 2000 study of informal areas, informal settlements are classified into different types. In Greater Cairo the large majority, or roughly 83% of informal settlements were found to be developed on privately held agricultural land. Informal occupancy on state-owned desert lands was limited to about 10 % of the total, which spread out from an initial legal nucleus, mostly in the Eastern part of Cairo, and the remaining 7 % of informal settlements were developed on agricultural reclamation land controlled by the state [16]. The pattern of irrigated agriculture land facilitates subdivision for building purposes. Figure 5a shows the rectangular shape of the land with an area around 175 square meters. The small-irrigated agricultural plots are separated by small irrigation channels, which become converted to the access lanes upon subdivision for building purposes. The informal development of state desert has different urban fabrics as shown in Fig. 5b. Building layout and streets are determined 'organically' over time through negotiation among settlers. [15].

Fig. 5a Informal urbanization on agricultural land [15]

Fig. 5b Informal urbanization on desert land [15]

5. PART FOUR: FACING INFORMAL SETTLEMENTS EXPANSION IN EGYPT

This part examines the development strategies in Egypt to solve the phenomenon of informal settlements. Drawbacks of the public housing in the New Cities are highlighted. Reasons of continuous expansion of informal settlements are discussed. The government has exerted a lot of efforts addressing the problem of informal settlements, which appears

in two major principles. The first is that informal areas are a problem that must be reduced or removed. The second is that the urban growth must be directed away from existing cities and agricultural land to desert areas. There are two types of approaches that the government takes to informal areas: preventative approaches to limit informal growth and interventionist approaches in which the government either improves or removes these areas. Interventionist approaches include eviction and demolition, resettlement, rehousing, and upgrading [18].

A series of laws were provoked aiming at prohibiting further intrusion by informal housing on agricultural land. These laws had a limited effect, but vertical and horizontal expansion of informal settlements was resumed in Cairo Metropolitan region [19]. Parallel efforts were done to preserve state desert land from encroachment. The state made an attempt to mitigate the expansion of informal settlements by introducing the New Towns policy. Its aim was to relocate and divert the demographic urban growth away from rich and scarce agricultural land into public housing on the desert fringes of the city. The New Towns and satellite cities were expected to absorb half the projected population growth between 1998 and 2017 [20]. However, their distance from the core Town, and their lack of services and economic opportunities, made them unattractive to low-income families.

The policy of creating modern planned desert settlements was and is still offered by government as the basic solution and alternative to the occurrence of urban informality. The new towns have been a favorite location for resettlement of families for slum clearance schemes. The state-subsidized public housing was first implemented in Cairo in the 1950s. The first project was the Masakin al-'Ummal project in Imbaba but only partly completed [21]. Two-floor attached units were constructed for factory workers. Other public housing projects were constructed around Cairo, all of which were walk-up apartment blocks, of a maximum of four floors. These units were very small and were distributed to 'limited income' families and lower-ranking government employees. Unfortunately, the government's programs rely on methods of distribution of units that do not relate to the needs of target families. These public housing units are poorly located and mainly accessible by private cars. Furthermore, it is prohibited in most buildings in

the new towns to open shops, services, offices, workshops and repair shops. Accordingly, the informal business sector is almost totally excluded from the new towns. The most serious problem facing the limited-income family who might be living in the new towns is transport. The long distances that must be covered represent an economic burden on the lower-income family. Moreover, the movement within the new towns is inconvenient as the distances between one part and another is very long [16].

A number of these satellite cities have been built, but despite many incentives encouraging Cairenes to relocate, they have not prospered as they were intended to. Housing in the New Towns was and still is unaffordable for the majority of Egyptians. In recent years, urban development in desert areas has increased and much construction is currently taking place. Some consequences of these developments are already obvious: the immense volume of traffic along the city's peripheral roads, and the impact on the environment. That is why vacancies in Cairo's desert new towns exceed 50 % [16].

By criticizing the informal areas and understanding the user's needs and deducing the reasons of why some works well, lessons can be drawn to either create successful settlements or upgrade the existing ones. The main characteristics of informal settlements that support positive aspects of the residential environment: walkability, self-sufficiency, convenience, home-work proximity, safety in residential streets, and resident participation in providing public services and maintenance. On the other hand, informal areas have many problems due to their unplanned construction. Services and infrastructure are insufficient. Residential densities are very high and there is an absence of open spaces, poor quality of roads, and poorly ventilated dwellings [22].

6. PART FIVE: DEVELOPMENT OF NORTH GIZA AREA AND IMBABA AIRPORT LAND

6.1 Introduction

Giza was the site of several plans, including the North Giza Master Plan, which included a project for the land that was once occupied by a small city airport at Imbaba. The North Giza Area, a very high densely occupied area, is totally full with informal

settlements on an area around 3 thousand feddans. These settlements are called Imbaba and El-Warak. There are only few vacant areas, about 560 feddans, which are expected to be housed with further informal residential settlements that would add extra burden to all inhabitants without any services. The infrastructures such as networks of water supply system, sewage and electricity are in poor condition and could not resist any extra stress. The governmental policy of development of the Northern Giza area is to transform these vacant areas into services for inhabitants [23]. Imbaba Airport had been removed, leaving a vacant area surrounded by densely populated settlements. For many years the development of Imbaba district has been informal.

Imbaba Airport District is selected as a case study in the present work for three reasons: first, it is a large ongoing urban transformation project; second, it does not consider all the issues of eco-cities during the development process; third, it has vacant surrounding areas for future developments. "The larger master plan involves stripping property owners of their land under a law that allows for the state to claim such property if it falls within a master plan that is considered for the public good." Little compensation is often paid [24]. Moreover, the main transportation network needs to be more efficient, so some existing narrow streets will be widened by demolishing a strip of the buildings in the informal settlements after re-accommodating the inhabitants in the new houses built in the area. Figure 6 shows the current building conditions, which are overloaded due to rapid population growth. The old infrastructure is in a poor condition.

Fig. 6 Informal settlements in Imbaba District [24]

The airport area was first considered by the Ministry of Housing, MOH, in the year 2000 to launch an ambitious and large-scale project. The area is planned to provide Imbaba's inhabitants with services. The project consists of several main components

including: a 38-feddan park, 40 feddans for buildings, youth center, 27 feddans of facilities for education, health and market services. The Giza Park is designed with agricultural theme, claiming to recall Imbaba's country-side heritage. Figures 7 and 8 show the park and its entrance.

Fig. 7 Site plan of the park [25]

Fig. 8 Entrance of the Giza Park, Public Housing Blocks at the back [24]

In a large area of about 40 feddans, located between the park to the south and the Ring Road to the north, the new housing blocks are built. The images in Fig. 9 show how the housing blocks are constructed in typical MOH style.

Fig.9 The Newly-built Housing blocks [24]

Figure 10 shows the Youth Center which is located adjacent to the residential buildings of the informal settlements, some of which are painted with the same color scheme of the Youth Center as shown in Fig. 11.

Fig.10 Youth Center [24]

Fig.11 Painted facades of informal houses [24]

The newly constructed services and green areas shown in Fig. 12 are supposed to enhance the quality of life of the inhabitants.

Fig. 12 The play ground of Institute of Aviation Engineering and Technology,Youth Center, Giza Park, new housing blocks, informal settlements [24]

In mid 2014 the Giza Governorate made a new initiative and was the promoter and driving force behind the 'Imbaba Urban Upgrading Project'. Partner institutions that helped to promote this project are Cairo University's Department of Architecture and the German Agency for International Cooperation, GIZ. This project builds upon the on-going efforts by the Giza Governorate to convert a former airport in Imbaba into a lively urban center. "It aims to show how a major change in land use and urban development in a complex and difficult context can help to improve the future not only of Imbaba's inhabitants, but also of Cairo as a whole"[26]. The project will provide this densely populated area with basic infrastructure and services: medical centers, schools, sport areas, green spaces for leisure, improved pedestrian and road connections, and new commercial streets near the already completed recreational park. The Urban Projects Finance Initiative, UPFI selected 'Imbaba Urban Upgrading Project' and aims to promote and develop sustainable and innovative urban projects that serve as best practice examples and are potentially replicable.

6.2 Analysis and Discussion

Upgrading the numerous informal settlements in Cairo metropolitan region is a critical and sophisticated mission, because of many social, financial, economical, political, engineering and other problems. The Imbaba housing project addressed some sustainability aspects. Providing open spaces, compactness and mixed-use housing are achieved. The highly dense residential district is composed of 178 buildings containing 3500 residential units on 22 hectares as shown in Fig. 13. A community plaza is located in the center of the neighborhood providing it with community facilities. Two main mixed-uses axes lead to the central plaza and link the neighborhood to the Giza Park. The inhabitants' quality of life is enhanced through integrating commercial uses with residential buildings and providing the inner plaza, which is connected to the green area of the Giza Park. However, the restricted entrance of the park by fees limits its usage. Pedestrianization is achieved throughout the project. A diversity of housing alternatives are provided with one, two and three bedroom flats. The project is connected to public bus root and the public\private microbus service, but no green transportation is provided.

Fig. 13 Layout of the residential units in Imbaba Airport Land [27]

The good potential of the Airport district is the presence of vacant lands that could be planned for resettlement of inhabitants living in the informal settlements around the area. Considering the eco-friendly materials and the eco-systems while planning for the future housing is an essential issue. It is proposed by the author that after relocation of inhabitants, the informal houses that were built on agricultural land should be demolished and transformed back into reclamation land, as shown in Fig. 14.

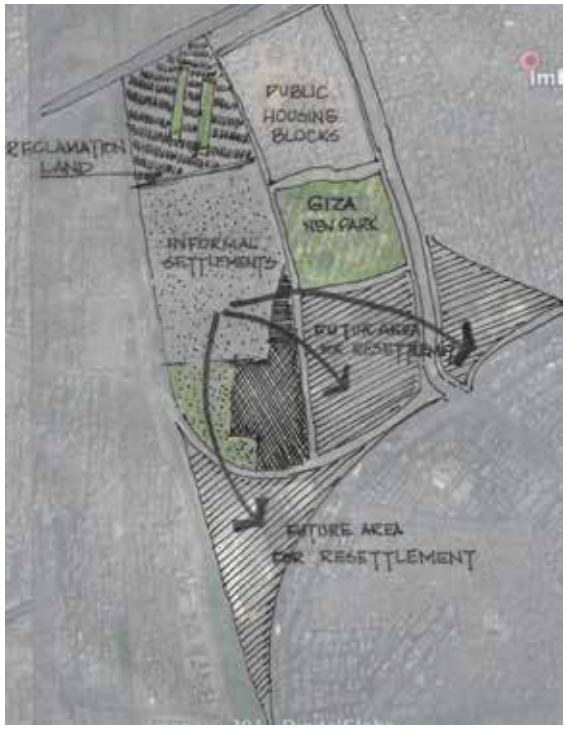

Fig. 14 Proposed relocation of informal settlements by the Author [28]

7. PART SIX: GUIDELINES FOR URBAN TRANSFORMATION OF INFORMAL SETTLEMENTS

In order to achieve urban development projects with integrated sustainable solutions, local requirements should be considered while putting the eco-city guidelines into practice [29]. Promoting cooperation between multi-disciplinary planning team as well as all investors is very important to achieve. A holistic approach, as a single integrated system, should be considered while planning an eco-city. The concept of integrated planning is the basis for sustainable urbanism. It requires an ongoing process of analysis and a multidisciplinary approach to sustainability. Transport, energy, material flow and socio-economic aspects are crucial. Extensive participation is an essential part of knowledge-based eco-city planning because the more stakeholders are involved in decision-making, the more knowledge they will contribute to the bottom-up planning process. The effective participation of different sectors and relevant sponsors guarantees the success of the whole process of eco-city planning and construction. Urban structure, transportation, energy and resource efficiency, socio-economic aspects and monitoring and evaluation should be considered during transformation.

7.1 Urban Structure

The efficient use of land resource is essential while developing informal settlements. To achieve an efficient urban structure the following guidelines should be considered:

- Optimizing the density of settlements with regard to the potentially contradictory requirements of transportation, solar architecture and quality of life.
- Planning compact building structure, such as multi-storey residential, commercial or mixed-use buildings instead of detached single-family houses.
- Conserving habitats for plants and animals and reducing biodiversity loss.
- Creating and maintaining enough open spaces and green areas in the form of gardens, parks, street-trees, green roofs, green facades and natural water features.

7.2 Transportation

- Allowing most people to travel on foot, or by bike or by public transport through rearranging settlements in a compact layout.
- Reducing private car usage.

7.3 Energy and Resource Efficiency

Minimizing the energy demand of the built urban structure and energy losses of buildings should be achieved through the following guidelines:

- Limiting the use of fossil fuels for air-conditioning and other electricity supply.
- Widely using renewable energy by utilizing solar architecture in the city, and efficiently using clean energy from the sun.
- Using environmentally friendly and sustainable produced materials.
- Utilizing advanced devices to treat wastewater so that it can be recirculated into the water cycle without negative impacts.
- Recycling or reusing solid waste through utilizing special devices that use landfill gasses as a kind of new energy.
- Collecting and purifying rainwater in areas subject to flash floods to help people use natural resources efficiently.

7.4 Social Infrastructure and Economic Viability

Satisfying social and economic infrastructure for a high-quality life should be provided through the following guidelines:

- Easy access to day-to-day facilities:
  . Locating kindergartens and elementary schools within walking distance.
  . Locating other schools, clinics and hospitals within walking/cycling distance or maximum 30 minutes by public transport.
  . Locating recreational facilities within walking distance or easily reached by public transport.

- Involving a variety of investors including owner-inhabitants, real-estate companies and professional developers help in achieving economic viability.
- Cooperating public and private sectors on different projects helps in fulfilling the public, social and societal goals with reduced funding from public sources and raising the return on related private investments.
- Measuring profitability of urban transformation projects that transform informal settlements into eco-cities through long-term success by; creating unique city context, reducing pollution, minimizing use of fossil fuels, improving people's health, enhancing life quality and providing more convenience for social activities

7.5 Monitoring and Evaluation

To ensure that the urban development process serves the goals of conserving resources, reducing pollution, increasing green spaces and improving people's residential life, evaluation procedures must be done through the following guidelines:

- Well-designed social feedback mechanism that integrates public opinions.
- Continuous evaluation with the participation of all relevant investors and sponsors relying on qualitative and quantitative tools to assess whether the proposed environmental, economic and social objectives have been met.
- Adaptation on regular basis in response to latest evaluation results.

8. PART SEVEN: CONCLUSION

- The creation and development of informal settlements is a critical problem threatening the quality of life in urbanized areas. Effective strategies, consistent efforts and innovative solutions should be provided by the state to stop the expansion of the informal settlements.
- Informal settlements could be avoided by providing suitably planned sustainable cities considering the human needs.
- Promoting density and focusing on public transport.
- Establishing a long-term planning framework and city wide approach is a must.

- Not all the guidelines for urban transformation of informal settlements are considered in the two study cases of Zeytinburnu and Imbaba Airport. Table 1 shows a comparison between the two projects.

Table 1: Comparison between Zeytinburnu Urban Regeneration Project in Turkey and Imbaba Urban Upgrading Project in Cairo

Guidelines for Transformation	Zeytinburnu Urban Regeneration Project, Turkey	Imbaba Urban Upgrading Project
Objective of the project	- To deal with the Istanbul Metropolitan area as a whole - To integrate urban projects for special areas identified in the Plan with each other and the rest of the city	-To strengthen the integration of Imbaba with entire city of Cairo by providing its inhabitants with basic facilities, and infrastructure
Local Requirements	Semi-public green areas, playgrounds, under-ground parking in courtyards, mixed-use building blocks: housing, offices, public facilities	Hospitals, schools, cultural activities, green spaces
Cooperation between multi-disciplinary planning team	A multi-disciplinary planning team are involved in decision making	Stakeholder participation in considering needs and priorities
Holistic Approach (Integrating Planning)	-The project aims to realize the economic, social and spatial regeneration at the district. - A system scheme has been developed integrating the potentials of green areas and the relationship with coast.	Improving public services, establishing new public services, green spaces, shops, improving pedestrian and road connections
Urban Structure	- Creating high standard, livable, sustainable, innovative, lively and aesthetic urban spaces - Protecting and enhancing the natural features of the city	Developing sustainable urban projects that serve as best practice examples
Transportation	Proposing new public transportation system	Widening some streets
Social Infrastructure and Economic Viability	A commercial axis that goes across the center is proposed in order to create spaces which will enable social activity and trigger urban regeneration	Commercial use is integrated into residential buildings
Energy and Resources efficiency	Mixed-use building blocks	Developing sustainable urban projects
Monitoring and Evaluation	To be assessed during the project implementation	During project implementation

- It is a very challenging issue to think how to transform Cairo into an eco-city, how to empower community participation and involvement, and preserve the local culture. Factors that will contribute in the city transformation are efficient land use, less transportation need, efficient use of resources, minimum negative impact on the environment and preservation of natural systems.

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التحول العمرانى للمناطق العشوائية فى مصر وتركيا

ان تنمية وبناء المدن المستدامة عامل مهم فى حل المشاكل الناتجة عن الزيادة السكانية فى المدن. والمشكلة التى يتناولها هذا البحث هى ان الاستراتيجيات والآليات المتبعة لتنمية المناطق العشوائية تغفل جانب الاستدامة. أى انه لا توجد استراتيجية متكاملة ومؤثرة تعمل على حل مشكلة الامتداد المستمر للمناطق العشوائية. لذا تهدف الورقة البحثية الى وضع خطوط ارشادية لركائز عملية تنمية المناطق العشوائية وتحويلها الى مدن مستدامة. وقد تم بيان السمات والخواص الرئيسية للمدن المستدامة - بجانب عرض نبذة عن مشروع تطوير منطقة عشوائية قديمة فى تركيا (زيتنبرنو) وبيان كيف تم أخذ بعض اسس الاستدامة فى الاعتبار اثناء عملية التغير العمرانى والتنموى لها. على جانب آخر تمت الاشارة الى جهود الدولة التى تبذل فى مصر لوقف المضار الناتجة عن الامتداد المستمر للمناطق العشوائية وذلك عن طريق بناء المدن الجديدة التى لم تكن الحل الأمثل لحل مشكلة العشوائيات. والدليل على ذلك قلة أعداد ساكنى المدن الجديدة وأن اغفال جانب الاستدامة فى المدن الجديدة كان سببا من اسباب فشل هذة المدن لجذب ساكنى العشوائيات للانتقال اليها. لذا تم الاشارة الى الجوانب السلبية فى المدن الجديدة لتجنب تكرارها عند تخطيط وتصميم المدن المستدامة. وفى نفس الوقت اظهار الجوانب الايجابية فى تصميم المناطق العشوائية وكيف انها ادت الى تلبية بعض احتياجات السكان التى لم تتوافر فى المدن الجديدة. وبعرض هذة الاحتياجات التى تحققت فى المناطق العشوائية تصبح هناك ركائز لتحديد المتطلبات التى يلزم توافرها للتنمية أو لتخطيط المدن الجديدة المستدامة. كما يقدم البحث دراسة وتحليل مشروع تطوير منطقة مطار امبابة. وقد تم التوصل الى أهم المحددات الارشادية لمشروعات التحول العمرانى فى المناطق العشوائية التى تأخذ فى الاعتبار جانب الاستدامة اثناء تخطيط تحويلها الى مدن مستدامة كما تمت المقارنة بين مشروعى التطوير فى مصر وتركيا.