



Alexandria University  
**Alexandria Engineering Journal**

[www.elsevier.com/locate/aej](http://www.elsevier.com/locate/aej)  
[www.sciencedirect.com](http://www.sciencedirect.com)



ORIGINAL ARTICLE

# Eco and Green cities as new approaches for planning and developing cities in Egypt



Hosam K. El Ghorab<sup>1</sup>, Heidi A. Shalaby\*

*Dept. of Architecture, Faculty of Engineering, Zagazig University, Egypt*

Received 6 October 2015; accepted 20 December 2015

Available online 3 February 2016

## KEYWORDS

Eco cities;  
Green cities;  
Green infrastructure systems  
– Livable cities;  
Sustainable development;  
Urban challenges and  
problems

**Abstract** The Egyptian cities have faced various challenges over the time, and such challenges had negative impacts on the development efficiency and performance of these cities, producing series of dangerous problems. Therefore, it became necessary to find out effective systems and technologies to address such problems.

This paper tries to attract decision maker's attention to apply sustainable development fundamentals and approaches of Green and Eco cities in planning and developing cities in Egypt, not only to deal with the Egyptian cities' structural problems and challenges, but also to help in improving the effective and efficiency of the existing strategy of new communities in Egypt.

This paper will introduce the first practice in planning and developing Green and Eco new city in Egypt (located at Eastern Desert, Sohaj governorate, on the corridor of Upper Egypt\Red Sea), including elaboration of its urban structure, land use and its green systems which produce most of its needed infrastructure (specially electricity power network, integrated sewage and solid waste management systems) without making any pressures on the national and local existing infrastructure systems. Finally, the paper will conclude lessons learned from the introduced practice, and present recommendations to improve Egyptian cities and make it more sustainable.

© 2015 Faculty of Engineering, Alexandria University. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Introduction

Many years ago, a lot of environmental, urban, social and economic challenges are facing Egyptian cities. These challenges have many negative impacts on cities' development efficiency

and performance. These challenges emerged as a result of many reasons including, adopting of ineffective and unsustainable policies, systems and technologies in the process of planning and management of Egyptian cities. In the next few years, and with high expectations of population increasing, it is expected that these challenges will be expanded to reach very dangerous degrees on human being. In this context, the importance of this paper comes out, as it tries not only to elaborate problems in Egyptian cities, but also to find an effective system and technologies to deal with these problems.

\* Corresponding author. Tel.: +20 10 60 60 10 52.

E-mail addresses: [hosamkotb@yahoo.com](mailto:hosamkotb@yahoo.com) (H.K. El Ghorab), [heidi.shalaby@yahoo.com](mailto:heidi.shalaby@yahoo.com) (H.A. Shalaby).

<sup>1</sup> Tel.: +20 12 2 990 9 220.

Peer review under responsibility of Faculty of Engineering, Alexandria University.

<http://dx.doi.org/10.1016/j.aej.2015.12.018>

1110-0168 © 2015 Faculty of Engineering, Alexandria University. Production and hosting by Elsevier B.V.

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 2. Urban problems in Egypt

Egypt faces many urban problems and challenges, including urban deterioration, slums and informal areas, land use conflicts, lack of basic services and infrastructure, road networks and traffic jams, population densities, urban sprawl on the agricultural land, environmental and visual pollution, concentration of economic activities in specific urban centers, weak and informal economic activities in most of urban centers, . . . etc. This paper will try to demonstrate number of these problems (the available space could not allow to demonstrate all problems) as follows:

(a) Increasing of population densities in urban and rural centers (see Fig. 1).

This problem emerged as a result of over population growth and the over concentration of population and economic activities in the Nile Valley and the Nile Delta. This problem causes many negative impacts especially on social services and infrastructure [1].

(b) Urban Deterioration, Slums and Informal Areas

This problem is considered as one of the most common problems in the Egyptian cities. Deteriorated urban areas are defined as the urban areas characterized by old and destroyed buildings, small size building and land blots, high population densities, lack of basic services and infrastructure, narrow and tortuous road networks. . . etc. [2]. Slums and informal areas are defined as settlements that have arisen in the absence of overall planning, with disagreements of law and violation upon the property of the State (see Fig. 2).

Both deteriorated urban areas and Slums and informal areas are lacking of all types of facilities and basic services including water and electricity; moreover, they do not have a police or health unit or a school or transport and are not reached by the emergency vehicle. As a result of this cruel deprivation of the minimum standard of living, the situation has spread among the inhabitants of these areas endemic diseases and the spread of ignorance and illiteracy and unemployment, and appeared category extracurricular law became a source of violence and terrorism [3].

(c) Urban Sprawl on the Agricultural Land

The problem of urban sprawl started at the beginning of 1970th decade and it is still continuing and threatening the limited highly fertile land in Egypt. Many official reports and studies have monitored and evaluated this problem and indicated that the built-up areas in the Nile Delta increased from 1134.7 km<sup>2</sup> in the year 1984 to 1593.7 km<sup>2</sup> in 1992 and to 3671.0 km<sup>2</sup> in the year 2006 [4], and also indicated that the agricultural land at the rural Governorates in Egypt was decreased from 6.156 Million feddans (without reclamation land) in the year 1986 to 5.957 Million feddans in the year 2002 [5] (see Fig. 3).

Another study indicated that built-up areas in the Greater Cairo Region increased from 42 km<sup>2</sup> in the year 1900 to 120 km<sup>2</sup> in 1950 and to 525 km<sup>2</sup> in the year 2000 [6], which is meant that the built-up areas increased about 12.5 times along this period while the population increased only about 9 times along the same period. On the other hand, the annual loss in agricultural land for urban uses In Egypt

has been estimated according to MPWWR (1984) between 10 and 75 thousand feddans with an average of about 45 thousand feddans annually [7], and has been estimated according to Ministry of Housing and urban communities between 50 and 70 thousand feddans [8], while it has been estimated of about 20 thousand feddans [9].

(d) Environmental Pollution

Environmental Pollution is considered as one of the most important and serious problems facing the Egyptian cities. This pollution includes air, soil and water pollution. This pollution emerges as a result of many factors, including the following [10]:

- Over concentration of population, Economic, industrial and traffic activities in urban centers, causes increasing of emissions and air pollution and makes extreme pressure on the existing infrastructure systems.
- Inadequate sewage disposal and solid waste management systems (see Fig. 4).

This pollution causes many negative impacts, not only on the health and life of the population but also on the total national production and efficiency of the national economy [11].

## 3. Sustainability approaches (Eco & Green cities)

### 3.1. Sustainability origins and concept

The phrase “Sustainable Development” was emerged and defined by the World Commission on Environment and Development in 1987. They set forth that “*sustainable development is improving people’s life-enabling habits to meet our needs in the present without compromising the ability of future generations to meet their needs*” [12]. Natural resources such as water, air, soil, plants, and animals are the basic assets upon which all life, human and otherwise, depend. Therefore, according to this definition it is unwise to use up these supplies, or we will be threatening the security of all people, in the present and future (see Fig. 5).

Sustainable development calls for improving the quality of life for all of the world’s people without increasing the use of our natural resources beyond the Earth’s carrying capacity. While sustainable development may require different actions in every region of the world, the efforts to build a truly sustainable way of life require the integration of action in three key areas [13]:

- *Economic Growth and Equity* – Today’s interlinked, global economic systems demand an integrated approach in order to foster responsible long-term growth while ensuring that no nation or community is left behind.
- *Conserving Natural Resources and the Environment* – To conserve our environmental heritage and natural resources for future generations, economically viable solutions must be developed to reduce resource consumption, stop pollution and conserve natural habitats.
- *Social Development* – Throughout the world, people require jobs, food, education, energy, health care, water and sanitation. While addressing these needs, the world community

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات