

Indicator system for assessing sustainable development in Egyptian new cities under water scarcity issue

Dr. Nada Saleh Mohamed Taher

Lecturer in Department of Environmental Planning and Infrastructure - Faculty of Regional and Urban Planning - Cairo University

eng_nada20072012@yahoo.com

Abstract

Egypt currently faces many challenges related to the sustainability of new cities, which suffer many of the current environmental and urban problems to achieve the goals of environmental sustainability as desired globally with disregard for the standards of achieving sustainability in the case of the scarcity of water resources as a global issue where the issue of water is at the forefront of the concerns of countries globally, including Egypt to confront all proposals and balance them through following the thinking of maximizing the benefit of rationalization and development of irrigation methods and increasing the efficiency of the uses of water resources in national projects. The proposal for new cities remained to accommodate the current population growth and population needs. The current planning thought of Egyptian urban communities does not match global requirements and developments towards sustainability, and lacks realism and flexibility in dealing with global environmental issues, including the issue of scarcity of water resources.

The research based on identifying the challenges to water sustainability in new cities, general study of standards and indicators for sustainability of development in light of the scarcity of water resources and the identification of selection criteria for indicators.

aim of identifying a system of indicators that contains a set of standards and indicators appropriate to the state of new cities in Egypt, which achieves the sustainability of development in the new communities in light of the scarcity of water and takes into account the quality of life of human beings in various fields, which help to identify gaps and weaknesses in the water sector in new clusters and identify priorities of development that take into account the thinking of sustainability.

Key words:

indicator systems, water city index, sustainable criteria, new cities, water scarcity

An Introduction

Egypt is currently facing a package of challenges related to water and water resources, as a result of the increasing population growth and in contrast the decrease in the per capita share of water, as the reports of future studies of the Information and Decision Support Center confirmed the decrease in the per capita share of water to reach 460 m³ / year by 2050 in light of the increasing growth For the population after Egypt has become below the water poverty line since

1993, where the water poverty limit is estimated at about 1000 m³/year per person, as shown in Figure (1). Therefore, the issue of scarcity of water resources is very complex in terms of its nature and its connection to our daily lives. (United Nations A., United Nations World Water Development Report, 2018), (Ministers M., 2009)

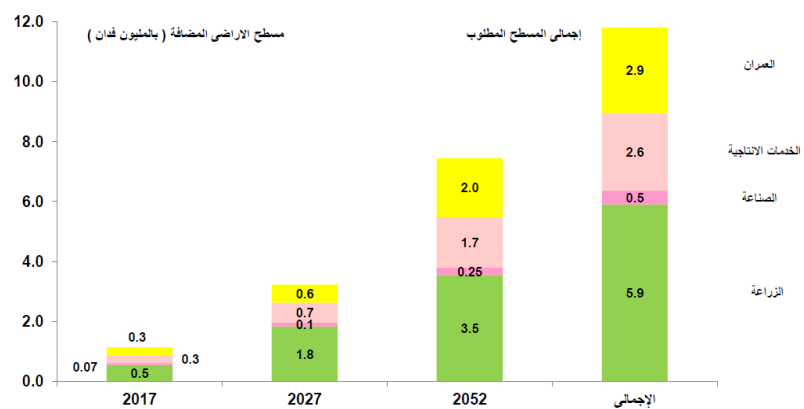
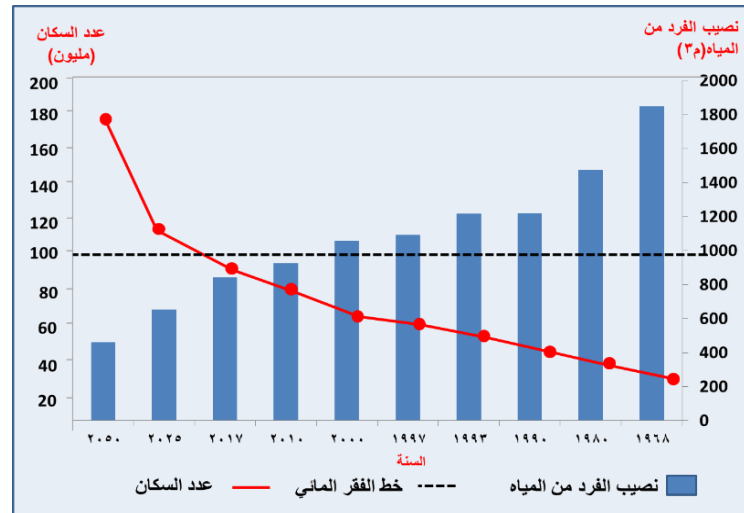
The current gap between the available need for drinking water is about 20 billion m³ / year, with an expected increase rate of up to 20% during the next ten years (Al-Omrani, 2016), in addition to the risks faced by the planning of new urban communities as a result of the water crisis caused by the construction of dam projects. In the Nile Basin countries, including

the Renaissance Dam, which is already being built in Ethiopia, which leads to a deduction of about 11 billion m³/year and represents about 20% of Egypt's share in the event of filling the Renaissance Dam within a period of 6 years (Ministers M., 2009) as the water challenges it faces are increasing Egypt, after the Ethiopian government has already proceeded with the construction of the Renaissance Dam, and it has become certain that the year 2013 represents the start of practical steps in influencing Egypt's share of the Nile water, which amounts to about 55.5 billion cubic meters (For Information, 2009)

Also, when the Nile water division agreement was signed between Egypt and Sudan in 1959, the per capita share of water was 2,500 m³, and after the Egyptians became 104 million in light of our fixed water quota, before the per capita share was reduced to 20%, it decreased to 20%. (The Strategy, 2019).

The country also uses 85 percent of its water resources for agricultural activities - with 90 percent of this being used in conventional agriculture. But agricultural wastewater, which carries residues of chemical fertilizers and pesticides, is discharged back into the Nile River (Srour, 2018).

And the scarcity of water affects the comprehensive development processes, which comes as a priority for the sustainable urban development of new urban communities, and since the water used in urban development requires high costs to pump it, as the environment and the economy are the most important elements of sustainable urban development (Mohamed Metwally Morsi, Imad Shafiq Abdel Rahman, Ahmed Saeed Gharib Al-Ghannam, 2021).



In light of the proposal of the National Strategic Plan for Urban Development in Egypt for the year 2052 (Ministry of Housing and Utilities, Urban Planning Authority, 2010), as well as the sustainable development strategy, Egypt Vision 2030 (Urban Development Axis) to double the area of the Egyptian globe within 40 years to reach 12% and estimate the areas required to accommodate The population increase is 2.9 million feddans, as shown in Figure No. (2) (Ministry of Housing, Utilities and Urban Communities, General Authority for Urban Planning, 2014)

As a result of the exacerbation of environmental problems and the problem of water scarcity, the need arose for standards to achieve the sustainability of the new urban communities, where the new urban communities represent the outlet through which most of the urban problems are solved in the existing urbanization, by attracting the population increase and activities towards the new communities to reduce the burden on the existing communities. Therefore, a trend comes Research towards defining and activating planning criteria to achieve sustainable development in new clusters in the sectors of transport, land management, resource use efficiency (Al-Salam, 2016).

And that is by integrating criteria and indicators of sustainable urban development in light of the scarcity of water resources, as the issue of water no longer concerns a specific sector, agency or ministry, but has become an issue that affects all Egyptian homes, as a result of the scarcity of water resources in Egypt and as a result of the importance of the role played by water resources in advancing the wheel Economic development, and it has become certain that the real measure of progress is not only in the abundance of available resources as much as in achieving the best use of them in order to achieve sustainable development (Environment, 2012).

The role of water in sustainable development is further emphasized in Goal 6 of the United Nations Sustainable Development Goals (SDGs): Ensure safe access to water and sanitation for all. The focus here is on achieving universal and equitable access to safe and affordable drinking water as well as adequate and equitable sanitation and hygiene for all. This simultaneously aims to improve water quality by reducing pollution and halving current levels of untreated wastewater, while significantly increasing recycling and reuse of safe water. In addition, governments have set a goal to protect and restore water-related ecosystems including wetlands, rivers, lakes and groundwater. (Arcadis, SUSTAINABLE CITIES WATER INDEX, 2016)

Research problem

Absence of a mechanism to assess the sustainability of development in new urban communities in Egypt in light of the issue of scarcity of water resources, in light of the state's ambitions for urban development and economic expansions in existing and proposed new cities

search objective

The research aims to apply the thought of indicator systems to assess the sustainability of development in the new communities in Egypt by proposing a scale to determine the standards and standard indicators that suit the Egyptian situation to determine the current situation and measure the efficiency of the water sector Egyptian communities in terms of flexibility and resilience towards the issue of water scarcity as a global issue affecting On the comprehensive

development of all sectors to direct future plans and projects for the communities in light of the standards that suit the situation of Egypt.

To achieve the objectives of the study, the research followed the following structure:

Challenges facing the sustainability of the water sector in new cities

Criteria and indicators of sustainable development in light of the scarcity of water resources

The suitability of indicators of sustainable development for the Egyptian case in light of the issue of scarcity of water resources for the Egyptian case

The system of indicators for assessing the sustainability of development in the new Egyptian communities in light of the scarcity of water resources

Findings and recommendations

Research Methodology

The research identified some of the basic steps that ensure the identification of criteria and indicators that constitute the system of indicators to be reached, which fit the Egyptian situation and are clear from Figure (3).

- Findings and recommendations

The indicators of assessing the sustainability of development play an important role in achieving sustainable development for new urban communities in light of the issue of water scarcity in order to understand the current state of the city and diagnose the gap and thus determine the needs and inputs required and set priorities for the implementation of plans and project programs.

The scale for assessing the sustainability of development for new communities in light of the scarcity of water resources takes into account the dimensions of sustainable development (social - economy - environment) taking into account the sustainability of urban development by taking into account the important spatial dimension of spatial and urban development.

It is necessary to integrate the measure of sustainability of water resources within the methodology of preparing the plan for new communities to determine the development priorities of any community based on the available water ration and without affecting the per capita share.

The evaluation scale helps decision makers to identify weaknesses and challenges, and to identify policies and strategies for dealing with the issue of water resource scarcity.

Emphasizing the importance of raising the efficiency of water use in the assembly by researching the amount of recycled water, the rate of waste generated per capita (sewage), the rate of deficit and water surplus from monthly rainfall, the percentage of water loss (leakage), the percentage of water that is recycled according to international standards Percentage of water samples that comply with drinking water standards, water quality, water consumption rate to determine the mechanisms and method of controlling water supply and demand.

It is difficult to numerically measure some indicators, but it can be taken as an initial assessment for specialists to support the idea of sustainable development in Egyptian communities within the framework of the new current and expected changes.

The importance of identifying mechanisms to activate indicators of sustainable development for new urban communities that suffer from the problem of water scarcity

Considering the importance of preparing a brochure of terms of reference for the sustainable planning of new urban communities, taking into account the problem of water scarcity because of its impact on the form of urban development for new communities.

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