Journal of
Engineering Sciences
Faculty of Engineering
Assiut University
JES
مجلة
العلوم الهندسية
كلية الهندسة
جامعة أسيوط
journal homepage: http://jesaun.journals.ekb.eg

Assessment of Sustainable Development Benchmarks for Remedial Slums' Projects "Applied on Re-housing Projects"

Received 1 December 2022; Revised 7 January 2023; Accepted 9 January 2023

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Keywords
Vision 2030- sustainable development- re-housing- unsafe slums- remedial slums

Abstract
After the announcement of the 2030 Agenda and publishing of UN goals, the world paid attention to the importance of sustainable development. Vision 2030, adopted on the pillars of sustainable development, including the urban aspect. In the recent years, government has focused on unsafe slums' challenge. It is considered extremely critical issue. It has a lot of environmental and economic repercussions, for that its development has become a vital requirement. Government, represented by the ministry of housing, has put a policy of demolition and re-housing to develop these areas.
The research highlights on this issue by presenting the unsafe slums' problems, and the government's recent efforts to face this issue. It depends on Egypt vision 2030 to achieve sustainable development for housing projects in its three pillars (social- economic- environmental), in addition to, the two aspects (urbanism- governmental associations). The aim of the research is suggesting evaluation approach using indicator systems to evaluate re-housing projects based on sustainable development dimensions for residential projects and Egypt vision 2030. This framework was ranked to arrange them according to its priorities and examined it in evaluating 3 re-housing projects: (Al-Asmarat - Rawdat Al-Sayeda Zainab - Maspero Triangle), through an electronic questionnaire with a group of (30) experts.

1. Introduction

Achieving sustainable development dimensions in urban settlements is one of the most significant challenges facing decision makers. In the case of slums, there are considered one of the most dangerous epidemics that threaten the safety and security of society. Because the increasing of slums' problems in Egypt, the government is making a great effort to eliminate the slums' problems. Government plans to treat and end slums' problems within 2030 [1]. Egypt vision 2030 aims to make Egypt without slums' and prepares an integrated

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https://doi.org/10.21608/JESAUN.2023.178233.1187

plan to achieve that and improving the quality of life [2]. This plan is based on sustainable development dimensions as social, economic, and environmental, in addition to, urbanism and governmental associations [3].

According to government vision, re-housing is considered the best solution for these problems. Re- housing projects are not limited to provide clean water, sanitation or housing units but must be improved the whole life aspects by providing good housing conditions based on sustainable development dimensions. This study suggests evaluation approach using indicator systems to evaluate re-housing projects based on sustainable development dimensions for residential projects and Egypt vision 2030. To achieve that, the research divided to 4 parts. First, literature review by focusing on Unsafe Slums' problems, government policies in treating these problems and Egypt vision 2030 for sustainable development for housing projects. Second, electronic questionnaire was conducted to determine the most important sustainable indicators that affect in re-housing projects and government's policies in remedial unsafe slums problems. Third, ranking and arranging sustainable indicators. Finally, examination the evaluation approach on three re-housing projects, namely (Al-Asmarat neighborhood - Rawdat Al-Sayeda Zainab - Maspero Triangle).

2. Literature Review

2.1 Unsafe Slums's problems

By increasing urbanization of the general populace, slums became a big challenge for developing countries. Slum can be defined as illegal and unplanned areas [4]. It is a highly populated urban residential area consisting of weak build quality housing unit, and incomplete infrastructure. Slums areas also can be defined as unsafe and old areas located within the city or outside the urban plan, with lacking in one or more of the following basic services and facilities: access to improved sanitation, access to improved water, sufficient living area, housing durability, and security of tenure [5]. In addition to the other definition, slums are divided into unplanned and unsafe areas which are prone to sliding blocks of rock, torrential rain, or railway accidents [6].

Slums are among the most urgent issues because of their social, economic and security repercussions that threaten the security and stability of society.

Economists also defined slums with an economic criterion and socialites with a social criterion, as they were defined as follows: "They are different types and styles of buildings such as huts and nests, as well as single small buildings that some independent individuals built, whether on agricultural lands or on empty land. Then this concept included all Buildings that are built without building permits or that were built against laws and regulations regulating urbanization and housing" [7]. Slums formed and grew for many reasons such as, rapid rural-to-urban migration, economic stagnation and depression, high unemployment, poverty, informal economy, poor planning, politics, and social conflicts [8].

In Egypt, slums were also defined as high-risk areas, and were classified according to the degree of danger as following [10]:

- First-degree risk areas (life-threatening areas), which are prone to sliding stone blocks from mountains, railways' accidents, … etc.
- Second-degree risk areas (unsuitable housing areas), which were built using waste building materials, or cracked buildings.

- Third-degree risk areas (harmful areas to health), which lack clean water, sanitation, areas influenced by industrial pollution, and areas under power lines.
- Fourth-degree risk areas (instability areas), which were built on state lands, or endowment lands. The increasing of slums needs appropriate methods and tools to assess the quality of urbanization in those areas. The evaluation system consists of three main pillars, which classify slums' patterns and ways of rehabilitation, Figure 1 shows criteria of evaluation and classification of slums. The main pillars are economic, social, and environmental conditions, Figures 2,3 show slums areas before rehabilitation.

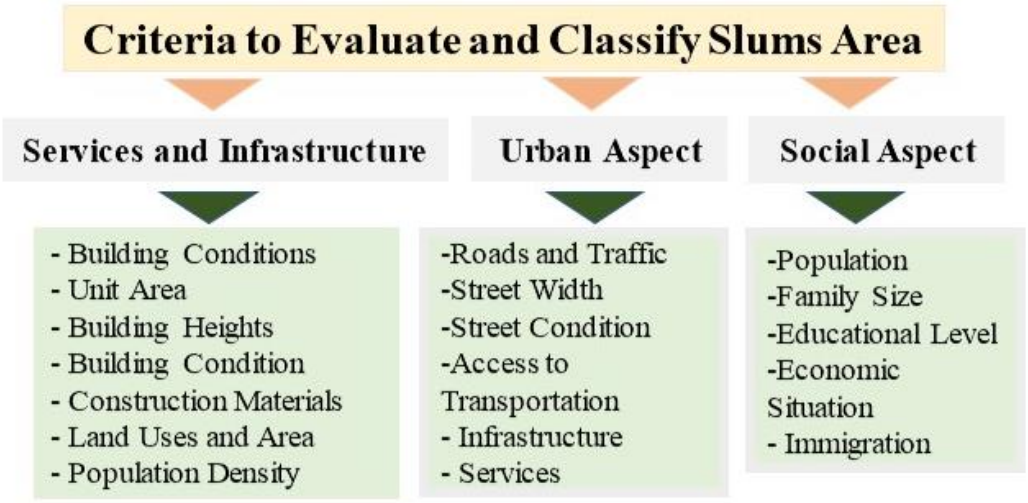


Fig. 1: Criteria of evaluation and classification of slums [9]

Fig. 2: El-Deweka before rehabilitation

Fig. 3: Maspero Triangle before rehabilitation

2.2 Approaches to remedial unsafe slums' problems

Strategies and approaches tried reducing and transformation slums, with varying degrees of success. These approaches include, slums removal, relocation, slums upgrading, urban planning with city wide infrastructure development, and public housing [11].

According to the classification of the degree of slums' danger, urban and housing strategies deal with unsafe slums, which vary according to economic, social, and environmental conditions of the area. Housing problems' strategies and solutions are rehabilitation, urban renewal, upgrade, and re-housing [12].

This part of research focuses on re-housing policy for remediating unsafe slums areas. Re-housing can be defined as an important solution for countries to face slums' problems, by achievement of sustainable development for the population of these areas getting rid of

slums, reduce crime and protecting land value. Also, re-housing is not limited on providing clean water, sanitation, and housing, but should aim to improve the community and providing housing and services [13].

The previous experiences in Egypt, re-housing in new cities outside the capital became an attempt solution for slums' problems, but they have many socio-economic costs. From these experiences, a lot of problems appeared, like that resident sold and rented their new housing units for many reasons [14].

There are many purposes for re-housing policies. Urban purposes such as areas located in life-threatening places and suffer from high population density and buildings dilapidated. social purposes such as areas which crime are spread, social and health diseases. Economic and national projects, such as expanding roads or infrastructure networks ... etc... [15]

Re-housing Policies are classified into three types: re-housing in the same area, re-housing in new area, and self-re-housing [16]. Re-housing policy is implemented in three phases: (evacuation phase- transfer phase- support phase) [17].

To evaluate sustainable development projects in slums areas should be included urban, social, economic, environmental criteria [18].

According to UN-HABITAT, the concept of sustainable development is divided into four main pillars that are divided into sub-indicators, as following [19]:

- Urban aspects such as: infrastructure, built urban environment, and natural environment.
- Social aspects: such as: equality and social justice, recreational aspects, security, and safety.
- Economic aspects such as: poverty, standard of living, wealth, and savings.
- Institutional aspects such as: the right to the city, the right to housing, the participation, and effective management.

In Egypt, head of the Council of Ministers established The Slum Development Fund in 2008, after the Duwayqa rock incident to prepare the national map of unsafe slums in 2010 [20]. It classified residential areas into three types: planned areas, unplanned areas, and unsafe areas [21]. According to vision 2030, government has made a long-term strategy to remedial slums' problems by 2030. This strategy is based on improving the quality of life and, standard of living in various aspects of life of the Egyptian citizen and consolidating the principles of social justice. It based on complete removal of slums areas and transferring of residents to new units in the same area as Rawdat Al-Sayeda Zainab or to other area as Al-Asmarat neighborhood [22]. Government has achieved many re-housing projects, as shown in table 1, and figs. 4,5,6,7,8,9, show samples of re-housing projects.

Table 1: Re-housing projects which was achieved in last few years [23]

In 2016	• Al-Asmarat neighborhood project in three phases to transfer residents of Establ Antar and Kalet Al-Kabsh
In 2017	• Removal of Tal Al-Aqrab slums to be replaced by Rawdet Al-Sayeda Zeinab neighborhood project • Development of Ain Al-Sira and Sour Magra El-Oyoun, to achieve tourist attractions
In 2018	• Removal of Gheit El-Enab slums to be replaced by Bashayer El-Khair neighborhood project in two phases
In 2021	A lot of development projects for slums areas have been implemented, such as: • Rawdet October "in October Gardens", to transfer residents of Nazlet El-Samman neighborhood. • Residences in Badr City, to transfer of residents of Sur Magra El-Oyoun

	• Rawdet Al-Sayeda Zainab, to re-house resident of Tal Al-Aqrab and Al-Tibi • Rawdet El-Obour project, to transfer of residents of Ezbet Abu Hashish, and parttial transfer of the residents of Ezbet Abu Qarn and Batn Al-Baqara • Re-housing in north and south El-Sayaden project in Ras El Bar • Rawdet Ras Ghareb project, to transfer residents of Eshash Al-Jabal • Rawdet El-Gardaka, and Rawdet Safaga projects in Red Sea, to transfer residents of Zerzara neighborhood. • Rawdet Al-Qusayr project in Red Sea, to transfer residents of Al-Kalahin neighborhood

Fig. 4: Rawdet El-Gardaka neighborhood

Fig. 5: Rawdet October neighborhood

Fig. 6: Bashayer El-Khair neighborhood

Fig. 7: El-Sayaden neighborhood

Fig. 8: Maan El-Salam neighborhood

Fig. 9: Al-Asmarat neighborhood

2.3 Egypt Vision 2030, and Sustainable Development for Residential Areas and their Role in Evaluating Unsafe Slum Development Projects

In September 2015, the general assembly adopted the 2030 Agenda for Sustainable Development that includes 17 Sustainable Development Goals (SDGs). The new Agenda emphasize a holistic approach to achieving sustainable development for all [24].

After the UN goals are published at United Nations, Egypt vision 2030 is a national agenda launched in February 2016. It reflects the country's long-term strategic plan to achieve the principles and goals of sustainable development, [25]. Vision 2030 reflects the three main dimensions of sustainable development such as economic dimension, social dimension, and environmental dimension [26]. This strategy also consists of ten axes, and each axis consists of its own elements, such as the strategic objective, sub-objectives, performance measurement indicators, planned targets to achieve the objectives, expected challenges, the necessary programs and projects, and priorities for their implementation [27]. Fig.10 shows the structure of Egypt vision 2030, and fig. 11 dimensions and axes of sustainable development.

Vision 2030 highlights on a set of goals such as, improving the quality of life of the Egyptian citizen, improving his standard of living in various aspects of life, emphasizing the consolidation of the principles of justice and social integration and the participation of all citizens in political and social life, … etc. It also represents some challenges such as, scarcity of natural resources, the deterioration of the environment, the modest resources of

human development in terms of population, health and education, and the inadequacy of the governance system [28].

According to goal 11: Sustainable Cities and Communities- Make cities and human settlement inclusive, safe, resilient, and sustainable, urban development and housing projects are directly concerned with the issues of sustainable development [29]. Sustainable development has been defined as compatibility between environmental, economic, and social development [30].

According to Egypt vision 2030, sustainable development of residential neighborhoods and remedial slum areas consists of three dimensions that complement each other. In addition to, there are another two dimensions to support the implementation of the principle of sustainable development for residential neighborhoods, urban dimensions, and governmental associations dimensions, as shown in table 2 [31].

Table 2: Sustainable development dimensions for residential neighborhoods

Sustainable dimensions	Descriptions
Social dimensions [32]	The aim of sustainable social development is achieving stability in population growth and developing health and educational services. Social indicators are represented through social equality.
Economic dimensions [33]	The aim of sustainable economic development is eradicating poverty through the exploitation of natural resources, achieving a balance between production and consumption, and providing job opportunities.
Environmental dimensions [34]	The aim of sustainable environmental development is preserving and promoting material resources, and development considers the preservation of the characteristics and performance level of natural resources. In addition to preserving the environment, properly disposing of waste, providing green spaces, and achieving balance.
Urban dimensions [35]	The aim of urban process is creating buildings, groups of buildings, spaces, and landscape, in addition to establish frameworks and procedures that will ensure success of future generations. Urban process is the art of making places.
Governmental and organizational associations dimensions [36]	It refers to actual form and regulation degree. It may be plan, spontaneous, permanent, temporary, official, or unofficial. Therefore, the civil society include various and effective human groups as groups, organizations, associations, movements, and institutions.

Fig.10: Structure of Egypt vision 2030

Fig. 11: Sustainable development dimensions and indicators

2.4 Sustainable Development Dimensions and its Indicators for Residential Areas

Sustainable development dimensions can be classified into economic, environmental, and social dimensions, as well as, urban dimensions, and governmental and organizational associations dimensions [37]. The most prominent sustainable development indicators for each are shown in table 3.

Table 3: Sustainable development indicators: Sustainable Development "Vision 2030"

N	Code	Sustainable Dimensions	Most Effective Sustainable Indicators
1- Social Indicators (S1)			
1-1	S1-1	Social infrastructure [38]	• Providing urban spaces and green spaces for social activities. • Achieving connectivity with neighboring areas. • Providing the opportunity for future extension to achieve future growth. • Providing services in residential area such as: (nursery- literacy classes- health care unit- club- … etc.) • Providing schools and encouraging education.
1-2	S1-2	Community relations [39]	• Supporting social cohesion. • Respecting the identity of the residents of the residential area while providing them with cultural and social rehabilitation. • Providing a sense of stability and belonging. • Safety.
1-3	S1-3	Legal laws & regulations [40]	• Owing the residents of their homes. • Providing opportunities for residents to work on private projects. • Crime rate in the residential area.
1-4	S1-4	Stakeholder participation [41]	• Participation of local community in decision-making. • Residents' participation in the development and maintenance of the residential area. • Residents' satisfaction with local services.

N	Code	Sustainable Dimensions	Most Effective Sustainable Indicators
1-5	S1-5	Social justice [42]	• Providing the daily human needs. • Achieving privacy. • Equitable distribution of housing units. • Providing self-sufficiency within the residential area.
1-6	S1-6	Partnerships [43]	• Activating the role of NGOs in the residential area.
2- Environmental Indicators (En2)			
2-7	En2-7	Resource uses [44]	• Energy efficiency and reliance on renewable energy. • Average per capita share of water resources. • Efficiency of infrastructure networks. • Percentage of green spaces.
2-8	En2-8	Emissions and waste [45]	• Providing rubbish bins. • Get rid of waste.
2-9	En2-9	Biodiversity [46]	• Percentage of noise pollution. • Percentage of environmental pollution.
3- Economic Indicators (Ec 3)			
3-10	Ec3-10	Economic performance [47]	• Housing cost depends on average income for per capita. • Recovering the cost of constructing the housing project. • Providing multi functions for land uses.
3-11	Ec3-11	Indirect economic impacts [48]	• Providing goods and services. • Providing job opportunities and fighting unemployment. • Providing economic resources that help in self-preservation. • Reduce cost of energy.
4- Urban Indicators (U4)			
4-12	U4-12	Urban morphology [49]	• Land uses and their diversity to achieve population's needs. • Urban style in terms of façade design, colors, heights, and finishing materials. • Street pattern.
4-13	U4-13	Perceptual dimension [50]	• Sense of place which refers to emotive bonds and attachments people experience locations and environments. • Environmental perception is our ability to perceive by the senses of sight, sound, smell, or touch that provide cues about the world around us must be present.
4-14	U4-14	Urban design social dimension [51]	• Relationship between people and space • Concerns issues of safety and security • Accessibility
4-15	U4-15	Functional dimension [52]	• Diversity in housing unit areas • Link with / connection with other surrounding areas • Providing parking spaces suitable with the density of Population • Providing suitable street width to achieve easy

N	Code	Sustainable Dimensions	Most Effective Sustainable Indicators
			access for emergency
5- Governmental Associations Indicators (G5)			
5-16	G5-16	Hierarchy and power centralization [53]	• Providing an organizational structure whose function is to monitor the preservation of the residential area.
5-17	G5-17	Controlling and monitoring [54]	• Monitoring to prevent building violations.

3. Methodology

The aim of the research is suggesting the evaluation approach using indicator systems to evaluate re-housing projects based on sustainable development dimensions for residential projects and Egypt vision 2030. This framework was ranked to arrange them according to its priorities and tested it in evaluating 3 re-housing projects. To achieve that, research based on 4 pillars:
First pillar (literature review): Seventeen sustainable indicators for re-housing projects which were identified in Egypt vision 2030, and government's policies in remedial unsafe slums problems.
Second pillar (baseline survey): Electronic questionnaire was conducted to determine the most important sustainable indicators that affect in re-housing projects and government's policies in remedial unsafe slums problems, then (30) electronic questionnaires were distributed as shown in table 4.

Table 4: The distribution of the electronic questionnaire to the experts

participants	Number
Urban design, and planning	8
Architectural design	5
Environmental planning	6
Urban sociology	5
Urban economy	6

Third pillar (statistical analysis): The result of electronic questionnaire was implicated. Statistical analysis was calculated, starting from calculating the main value (μ), standard division (α), and coefficient of variance (CV) to measure the homogeneity of the sample, then, concluding the relative importance index (RII) by using (Likert) classification (K) which can define as a psychometric scale commonly involved in research that employs questionnaires. It is the most widely used approach to scaling responses in survey research, and it is used interchangeably with rating scale, as: [55]

(EI)= Extremely Important.
(I)= Important.
(A)= Average.
(NI)= Not Important.
(ENI)= Extremely Not Important.

Finally, the study set the importance level and relative ranking for each sustainable indicators and role ratio to each phase, by using the following equations:

$$(\mu)= n1 + 2n2 + 3n3 + 4n4 + 5n5/ \text{ Total number of samples}$$

$$(CV) = (\alpha/\mu) * 100$$

As regard the (CV) result, the average was 18.66762772 (between 10-20), which means that sample was homogeneous and balanced where:

- CV < 10 = Excellent sample
- CV (between 10 – 20) = Very good
- CV (between 20 – 30) = Acceptable
- CV (between 30 – 40) = Low
- CV > 40 = Unacceptable

The relative importance index (RII) is defined as a weighted average method in which the average rank for each question is calculated and then the rank for each capability is derived from the average of the ranks of the questions grouped under that capability. It is used to determine the relative importance of sustainable factors involved the points of Likert scale [56]. The Relative Importance Index (RII) was calculated by using the following equation:

$$(RII) = n1 + 2n2 + 3n3 + 4n4 + 5n5 / 5 (n1 + n2 +n3 + n4 + n5)$$

- RII = 0: 0.2 = Importance Level (Low = L)
- RII = 0.21: 0.4 = Importance Level (Medium Low = M-L)
- RII = 0.41: 0.6 = Importance Level (Medium = M)
- RII = 0.61: 0.8 = Importance Level (Medium High = M-H)
- RII = 0.81: 1.00 =Importance Level (High = H) 57].

Where (n5) the number of experts scored (EI), (n4) the number of experts scored (I), (n3) the number of experts scored (A), (n2) the number of experts scored (NI), (n1) the number of experts scored (ENI).

Forth pillar (testing): In this part of the research, the framework was tested with 3 models of re-housing projects, namely (Al-Asmarat neighborhood - Rawdat Al-Sayeda Zainab - Maspero Triangle).

4. Results and Discussion

The results of the study were divided into two parts. The first part is from electronic questionnaire according to experts' evaluation for sustainable development indicators for housing projects, as shown in fig. 12. Second part after ranking the sustainable development dimensions. It should be examined according to its efficiency in housing projects. It is achieved by applying it in three re-housing projects and measuring the percentage of the five sustainable development dimensions.

First, from the statistical analysis of the Electronic Questionnaire, and after verification of the questionnaire through (CV) coefficient as shown in tables 5, 6, the most important sustainable dimension was social dimension, and the most important indicator with highest global weight was (functional dimension), as well as (ten) indicators were ranked (high), and (seven) indicators were ranked (medium high).

Second, from RII evaluation, and the calculated weights for sustainable dimensions and indicators. This part of the research examined the effectiveness of the sustainable framework by applying it on three re-housing projects, namely (Al-Asmarat neighborhood- Rawdat Al-Sayeda Zainab- Maspero Triangle), table 7.

The evaluation of the three re-housing projects was measured according to the global weights for the indicators. Where it was considered that while the indicators of sustainable dimensions were achieved, it was given a complete global weight. For each experience, the summation of all global weights for all sustainable indicators was multiplied by 100 to present it as a percentage and average weights for each sustainable dimension was multiplied by 100. The results are summarized as shown in fig.13, and table 8.

More specially, in terms of evaluating re-housing projects, Al-Asmarate re-housing project recorded the highest score in most of social dimensions by providing open spaces, and playgrounds, as well as the achievement of stakeholder participation. In other side, the residential unit's area is small, and there is lack on future extension opportunities. For economic dimension, no provision of job opportunities except a few shops under residential buildings as in Rawdat Al-Sayeda Zeinab and Maspero Triangle, or central market as Al-Asmarat neighborhood. In addition to environmental dimension, these projects remedial with infrastructure problems, and garbage collection to provide healthy environment. In urban aspect these projects characterized by a diversity of land uses and presence of an urban character, especially Rawdat Al-Sayeda Zainab neighborhood, which has a historical direction in facades' design and colors. Streets achieve easy movement of vehicles. There are monitoring and maintenance authorities whose role is preventing any modifications in existing buildings.

Table 5: The statistical analysis of sustainable development dimensions results

N		EI	I	A	NI	ENI	Mean	Standard Deviation	Coefficient Of Variance	Relative Important Index	Importance level	Relative ranking
							μ	α	cv	RII		
Sustainable development Dimensions	S1	17	9	3	1	0	4.400	0.5657	12.8565	0.880	High	1
	En2	14	10	3	3	0	4.167	0.6852	16.4438	0.833	High	2
	Ec3	10	9	5	4	2	3.700	0.8784	23.7418	0.740	Medium High	4
	U4	12	9	6	3	0	4.000	0.7071	17.6777	0.800	Medium High	3
	G5	10	9	5	4	2	3.700	0.8784	23.7418	0.740	Medium High	4

Table 6: The statistical analysis of sustainable development indicators results.

N		EI	I	A	NI	ENI	Mean	Standard Deviation	Coefficient Of Variance	Relative Important Index	Importance level	R. ranking	G. ranking
							μ	α	cv	RII			
Sustainable Development Indicators	S1-1	12	12	4	1	1	4.100	0.6916	16.8687	0.820	High	3	6
	S1-2	15	11	4	0	0	4.367	0.4994	11.4377	0.873	High	1	2
	S1-3	13	11	5	1	0	4.200	0.5888	14.0187	0.840	High	2	5
	S1-4	10	9	5	4	2	3.700	0.8784	23.7418	0.740	Medium High	5	12
	S1-5	15	10	2	2	1	4.200	0.7394	17.6040	0.840	High	2	5
	S1-6	10	9	6	4	1	3.767	0.8100	21.5046	0.753	Medium High	4	11
	En2-7	14	10	6	0	0	4.267	0.5457	12.7896	0.853	High	2	4
	En2-8	15	10	4	1	0	4.300	0.5817	13.5271	0.860	High	1	3
	En2-9	9	12	5	2	2	3.800	0.8042	21.1620	0.760	Medium High	3	10
	Ev3-10	8	6	6	7	3	3.300	0.9513	28.8277	0.660	Medium High	2	13
	Ev3-11	12	9	5	2	2	3.900	0.8436	21.6309	0.780	Medium High	1	9
	U4-12	12	10	5	2	1	4.000	0.7528	18.8193	0.800	Medium High	3	8
	U4-13	6	5	8	6	5	3.033	0.9571	31.5540	0.607	Medium High	4	14
	U4-14	14	7	5	4	0	4.033	0.7634	18.9272	0.807	High	2	7
	U4-15	16	10	4	0	0	4.400	0.5033	11.4391	0.880	High	1	1
	G5-16	12	10	5	3	0	4.033	0.6948	17.2270	0.807	High	2	7
	G5-17	13	9	6	2	0	4.100	0.6671	16.2703	0.820	High	1	6
Average of (Coefficient of Variance CV)											18.66762772		

Table 7: Experiences for re-housing projects

Asmarat Neighborhood Project	
Project Objective [58]	Achieving quality of life by: • Creating an integrated residential community. • Providing all necessary services. • Transferring all residents of slums to this community. • Providing safe and stable life.
Development policy	Rehousing by relocated the residents of El-Dweqa neighborhood, Monshaat Naser neighborhood, and Ezbet Khairala neighborhood and removed these slums.
Project stages	Project was divided into three stages with 200 feddan, as following: First stage: construction of 6258 housing units consisting of ground and 5 typical floors, was costed 850 million. Second stage: construction of 4722 housing units consisting of ground and 5 typical floors, was costed 700 million, in addition to construction of service buildings and facilities. Third stage: construction of 7440 housing units consisting of ground

	and 9 typical floors, was costed 95 million, in addition to secondary school, open playgrounds, commercial market, and parking.
Project stakeholders	Cairo Governorate, Businessmen, Armed Forces, and Actual Residents.

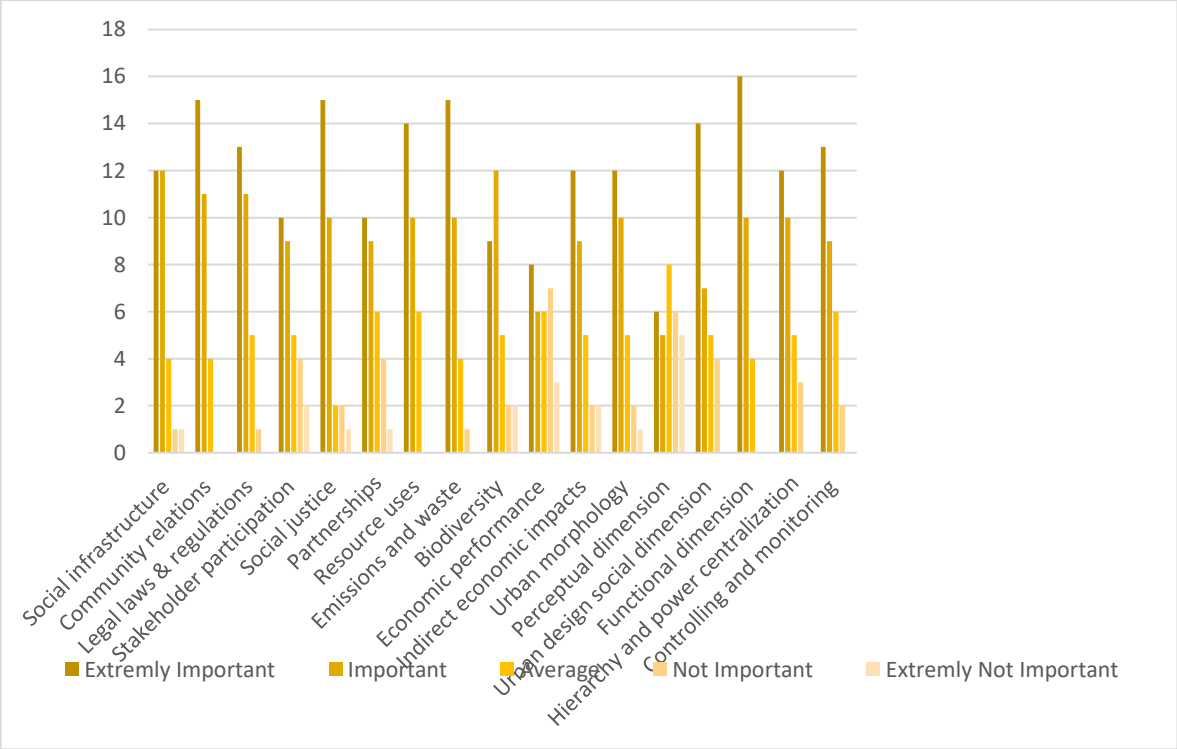
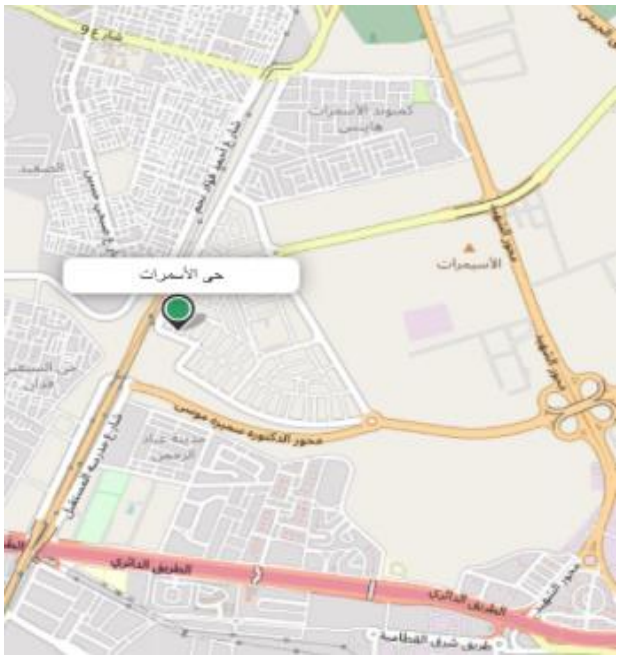


Fig. 12: Experts evaluation for sustainable development dimensions



Rawdat El-Sayeda Zeinab Neighborhood Project	
Project Objective [59]	Achieving quality of life by: • Re-housing the actual residents of Rawdet El-Sayeda Zeinab neighborhood. • Providing safe and stable life.

Development policy	Cairo government removed the old buildings of Tal El-Aqareb residential area and established Rawdet El-Sayeda Zeinab neighborhood to re-house the actual residents of the old residential area. This project was started in September 2016 until July 2017.
Project stages	The project includes (16 residential buildings with 816 housing units and 344 shops on ground floor)
Project stakeholders	Consist of Cairo Government, Ministry of Housing, Cairo Development Authority, about 1250 workers from the residential area.

Masbero Triangle Neighborhood Project	
Project Objective [60]	Achieving quality of life by: • Creating an integrated residential community. • Rehousing all residents of slums to this community. • Re-planning the residential area around Masbero building. • Achieving environmental and tourism rehabilitation.
Development policy	Removing the old buildings of residential area and established another neighborhood to re-house a part of actual residents of the old residential area inside and other part outside.
Project phases	The project objectives are two main axes: First: social development in education, health, and culture fields. Second: removing all old buildings and re-construction new buildings. The Maspero Triangle has been divided into six areas according to the activity that will take place in them, namely: (Residential area - investment areas of a heritage character - commercial investment areas and towers overlooking the Corniche - recreational areas - commercial areas - service areas of a heritage nature) so that the area is an architectural, cultural and heritage formation integrated with the style of Khedive Cairo near it.
Project stakeholders	Consist of Cairo Government, Ministry of Housing, Cairo Development Authority, about 1250 workers from the residential area.

Table 8: Experiences' evaluation for re-housing projects

Achivement		S1						En2		Ec3			U4				G5	
		S1-1	S1-2	S1-3	S1-4	S1-5	S1-6	En2-1	En2-2	En2-3	Ec3-1	Ec3-2	U4-1	U4-2	U4-3	U4-4	G5-1	G5-2
Al-Asmarat	Achieved	0.9			0.8	0.8	0.8	0.9	0.9			0.9				1		0.8
	Partly achvieved		0.5	0.7									0.5		0.5		0.6	
	Not achieved									0	0.1			0.4				
	Total Achievement of Sustainable Development Indicators =64.7 %																	
Rawdat Al-Sayeda Zeinab	Achieved			1	0.8	1	0.8					0.9				0.8		1
	Partly achvieved	0.7	0.5					0.5	0.5						0.5		0.5	
	Not achieved									0	0.1		0.4	0.3				
	Total Achievement of Sustainable Development Indicators =59 %																	
Masbero Triangle	Achieved			1			0.8					0.9				0.8		
	Partly achvieved	0.5	0.5		0.5	0.5		0.5	0.5						0.5		0.5	0.5
	Not achieved									0	0.2		0.3	0.3				
	Total Achievement of Sustainable Development Indicators =58.7 %																	

Note: Achieved: > 0.7, Partly achieved: from 0.7 to 0.5, Not achieved: < 0.5

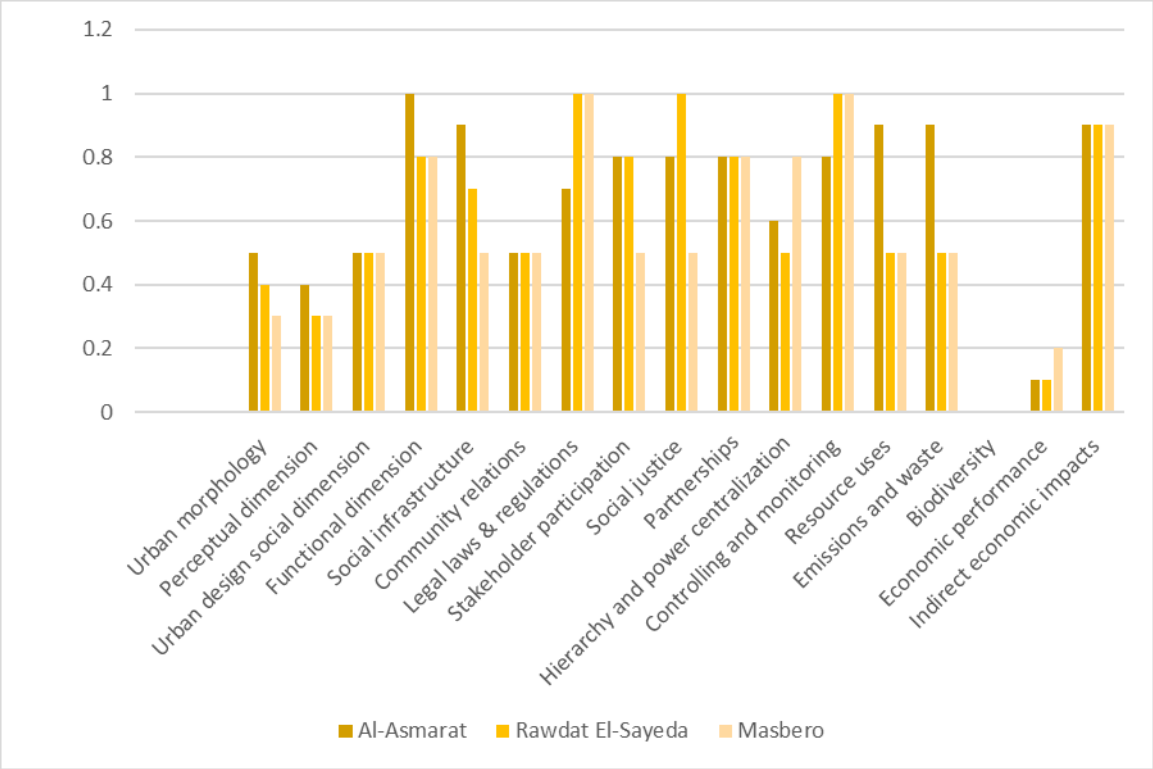


Fig. 13: Experts evaluation for re-housing projects

5. Conclusion

Slums are one of the most complicated challenges faced Egypt government, as the illegal informal housing development in slums pose a formidable pressure on policy makers.
In addition to, sustainable development dimensions have directly affected in re-housing projects. The research highlights on the problem of unsafe slums. By focusing on social, environmental, economic, urban, and governmental associations dimensions and the role of re-housing policies in remedial slum's problems. Egypt vision 2030 for sustainable development dimensions and indicators play a vital role in housing projects and remedial of slums by applying re-housing policies.
These indicators were evaluated by electronic questionnaire according to (30) experts' opinion to determine the most important sustainable indicators that affect in re-housing projects and government's policies in remedial unsafe slums problems.
After ranking the sustainable development dimensions, this evaluation approach was examined by applying in three re-housing projects and measuring the percentage of the five sustainable development dimensions.
Finally, the suggested evaluation approach that was designed according to Egypt vision 2030 for sustainable development is important to measure the achievement of sustainable indicators in re-housing projects.

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تقييم معايير التنمية المستدامة لمشاريع إصلاح الأحياء العشوائية "تطبيقا على مشروعات إعادة التسكين"

ملخص البحث

بعد إعلان خطة ٢٠٣٠ ونشر أهداف الأمم المتحدة، انتبه العالم لأهمية التنمية المستدامة. رؤية ٢٠٣٠، المعتمدة على ركائز التنمية المستدامة، بما في ذلك الجانب الحضري.

في السنوات الأخيرة، ركزت الحكومة على تحدي الأحياء الفقيرة غير الآمنة. تعتبر قضية حرجة للغاية. لها الكثير من التداعيات البيئية والاقتصادية، لذلك أصبح تطويرها مطلبًا حيويًا. وقد وضعت الحكومة ممثلة بوزارة الإسكان سياسة الهدم وإعادة التسكين لتطوير هذه المناطق.

يسلط البحث الضوء على هذه القضية من خلال عرض مشاكل العشوائيات غير الآمنة، والجهود الحكومية الأخيرة لمواجهة هذه القضية. تعتمد على رؤية مصر ٢٠٣٠ لتحقيق التنمية المستدامة لمشروعات الإسكان في أركانها الثلاثة (الاجتماعية - الاقتصادية - البيئية)، بالإضافة إلى الجانبين (العمراني - الجمعيات الحكومية).

الهدف من البحث هو اقتراح إطار لتقييم مشاريع إعادة الإسكان بناءً على أبعاد التنمية المستدامة للمشروعات السكنية ورؤية مصر ٢٠٣٠. وقد تم تقييم هذا الإطار لترتيبها وفقًا لأولوياتها وتم اختباره في تقييم ٣ مشاريع إعادة الإسكان وهي: (الأسمرات - روضة السيدة زينب - مثلث ماسبيرو)، من خلال استبيان الكتروني مع مجموعة من (٣٠) خبير.

الكلمات المفتاحية

رؤية ٢٠٣٠- التنمية المستدامة- إعادة التسكين- العشوائيات الغير آمنه- إصلاح العشوائيات